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LANDSCAPE MODEL OF THE *UMA LENGGE* TRADITIONAL SETTLEMENT, WEST NUSA TENGGARA

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Abstract

Indonesia has a high diversity of cultural landscapes from Sabang to Merauke. One of them is the cultural landscape of the Dou Mbojo indigenous community in Bima Mariah, West Nusa Tenggara. The Dou Mbojo indigenous community has a traditional settlement called uma lengge. What makes the lengge uma unique is that it is a multi-functional house, namely as a barn for rice and other agricultural products, as well as as a residence. The character of uma lengge is reflected in the architecture, daily activity spaces and other elements forming the character. It should be conserved from cultural degradation for the sake of the identity of future generations. The research aims to analyze the features and elements forming the settlement landscape which indicate the character of the uma lengge traditional settlement landscape based on the local culture (Dou Mbojo). The method used in this research was a descriptive method through three stages, namely literature review, in depth interview and site observation. The research results show that the landscape model of the uma lengge traditional settlement was formed from natural and man-made features. Natural features include landform elements (terraced rice fields, gardens and forests), plants (rice, garden plants and forestry plants), pavement (circulation inside and outside settlements) and water (spring and river). Man-made features include building elements (uma lengge, mosque), plants (paddy, forest, dryland and fence plants), pavements (road and pathway) and site furniture (fences). The landscape model of the settlement was in the form of a nucleus pattern with the uma lengge as the core. This relatively ideal model being supported by strong traditional institutions and preserves their own environment and culture.

Keywords*:* Dou Mbojo; *Landscape character; Landscape design; Landscape model, Nucleus pattern*

Introduction

Landscape is feature and character of a land or part of the earth face with all the life and everything within it, both natural and man-made, which is part or total of the living environment of human being and other living creatures, as far as the eye can see, as far as all the senses can capture and enjoy, as far as the imagination can reach and imagine [1]. The character of a landscape which is a human living environment will vary according to the culture of the people who inhabit it [2]. Landscape character is also influenced by the elements forming the landscape which include natural and man-made features [3, 4]. Natural features show the character of the landscape on a broad scale such as mountains, rivers, lakes, valleys or canyons. Man-made features are natural features that have been influenced by human intervention for the survival of human life itself such as rice fields; and then it can be called as a cultural landscape [5, 6]. Indonesia has a high cultural landscape diversity. It is closely related to the large number of indigenous peoples in Indonesia. Each indigenous community occupies a certain area and forms a settlement. The feature of traditional settlements is influenced by the culture of the

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people who occupy them. The existence of identity in an indigenous community shows the existence of a territorial function that allows the community to control its environment. Settlements are a territorial unit that can provide security, identity and stimulation for its residents in the form of home base behavior. Traditional settlements of indigenous communities can be sustainable because they maintain the customary rules and values that are applied in everyday life [7]. Changes in the culture of a society can cause changes to its landscape [8], especially for the traditional settlements landscape of indigenous people. Indigenous people who uphold their customary rules can maintain their landscapes in a sustainable manner [9].

The diversity of traditional cultural landscapes is very high in Indonesia with landscape characters that are very unique from each other. One of these cultural landscapes is the settlement landscape of the Bima Maria indigenous community, West Nusa Tenggara, which is reflected in the *Uma Lengge* Complex. Uma lengge is a traditional residence whose shape is conical and crossed at the ends of the roof and also functions as a place to store agricultural crops, especially rice**.** There is still very little information about *uma lengge*, such as information about architecture and socio-culture [10], structure and patterns [11], thermal characteristics [12] and others such as those related to batik patterns [13]. Information relating to settlement landscapes is still very limited, especially the character of the *uma lengge* landscape and the elements forming the character. Landscape character is very important in the field of landscape architecture, because it can differentiate a landscape from others, especially for the traditional settlement landscapes influenced by the culture [5, 14].

The character of the *uma lengge* settlement provides its own uniqueness which is different from the others in eastern Indonesia. The settlement character is reflected in the *uma lengge*'s architecture, daily activity spaces and elements forming the character. However, the total character of the traditional settlement landscape of the *Dou Mbojo* community which combines elements, spaces and activities has not yet been well formulated as a spatial model. Therefore, this model needs to be researched further to produce a model that can be used in further activities such as planning, preservation, or even detailed design to accomplish the *uma lengge* settlement area. This research aims to analyze the features and elements forming the settlement landscape which indicate the character of the *uma lengge* settlement landscape based on the culture of the local indigenous community, *Dou Mbojo*.

Research Methodology

This research was conducted in Maria Village, Wawo District, Bima Regency, West Nusa Tenggara Province (Fig. 1). Maria Village is one of the villages that still maintains the traditional houses of the *Dou Mbojo* community in the form of the *uma lengge* traditional settlement complex. Geographically, the village is located at 118º 84' 33" East Longitude and 8º 52' 01" South Latitude. *Uma lengge* (traditional house) has a basic area of around 78m^2. The research method used is a descriptive method through searching for cultural information. The searching was carried out in three stages of research implementation, namely literature study or searching for the traditional document, interviews with custom leader and site observations [6, 15].

The first stage was literature study or searching for the traditional manuscripts/ documents of the *Dou Mbojo* community. This activity was carried out before interviewing the custom leader. At this stage, traditional manuscripts in the form of writing in local traditional letters are not available. However, various traditional ceremonies and rules were available in the form of a collection of manuscripts typed manually and bound simply. These texts were compiled by local traditional leaders at this time. Literature studies were focused on information relating to the elements that form the character of settlement landscapes and their layout, settlement patterns, as well as the functions and philosophies contained therein. Table 1 is the result of a literature review relating to the elements forming the character of traditional

landscapes in several indigenous communities in Indonesia. These elements are extracted from previous research results and references that describe the character and elements of landscape [2, 5, 17]. This basic information (Table 1) was used for interviewing the custom leaders.

Fig. 1. Research location

Table 1. Elements forming the character tradisional settlement landscape

No.	Basic Elements	Settlement Elements	Explanation
1.	Buildings	(1) house, (2) barn, (3) mosque, (4) public hall,	Layout and function of elements;
2.	Landform	(5) open area (level landform),	Sources of information come from
3.	Pavements	(6) main street, (7) pathway,	the traditional manuscript, custom
4.	Water	(8) river, (9) bathing place,	leader and site observations.
5.	Plants	(10) rice field, (11) dryland, (12) forest	

Sources: [2, 5, 17]

The second stage was an interview with custom leader of the *Dou Mbojo* community whose his willingness had been confirmed in advance. The interview was conducted at the *uma lengge* complex at the suggestion of the custom leader. The interview topic was directed at the elements forming the character of traditional settlement landscape (Table 1). The next stage was site observation. Site observation, which are the final stage, are carried out after the first two stages had been carried out. This was intended to verify the existence of the elements as a result of the previous two stages [6, 15, 16].

Results and discussion

Uma lengge is one of the traditional houses left by the ancestors of the Bima tribe (*Dou Mbojo*) which *uma* means *house* and *lengge* means *pursed/crossed shoots*. The purse house functions as a residence house and as a barn. The harvested rice and tubers are stored in *uma lengge* for one year's needs. *Uma lengge* is located in an area bordered by a wall and is outside the current community settlement. The placement of *uma lengge* locations like this was designed with wise considerations (local wisdom) to avoid undesirable things such as fires and

excessive use of rice (savings). Being located far from home, it is hoped that housewives can save money on rice because they have little difficulty collecting it [18].

Placing the rice barns in groups and separately from settlements is also carried out in other indigenous communities in Indonesia, such as the *Baduy Dalam* indigenous community with almost the same philosophy [19]. However, uma lengge is different from *leuit* (paddy barn) in the Baduy Dalam community, *uma lengge* can be used as a place to live, the 1st and 2nd floors are the living areas for *uma lengge*. The 1st floor is used to receive guests and is also a place for family chats. The 2nd floor is used for sleeping and storing harvested crops (paddy and tubers) [18]. The *leut* of Baduy Dalam people is used only for storing rice and cannot be occupied as a house or stay in night (Fig. 2) [19].

Fig. 2. Paddy barns of Baduy Dalam dan Bima Mariah peoples

Elements forming the uma lengge settlement landscape

The main elements forming the traditional settlement include the *ume lengge* houses, pathway circulation, open space, boundary hedges and walls. Landscape elements outside the settlement include rice fields, dryland farm, forests, rivers and water springs (*oi wobo*), road, recent community settlement and mosque. All elements forming the settlement landscape, both the results of literature reviews, interviews with local custom leader and the results of observation at the site can be seen in Table 2.

In Table 2, the results of searching for the elements had been completely identified, both in the form of landscape features required by *B.W. Starke and J.O. Simonds* [2] as well as basic elements forming the landscape character according to *N.K. Booth* [17] and elements of the traditional settlement landscapes as a result of previous research [6, 20]. Overall, these elements fulfill the concept of landscape features forming the local landscape character as proposed by *B.W. Starke and J.O. Simonds* [2]. These landscape features (natural and man-made) show a pattern of the traditional settlement landscape character of the *Dou Mbojo* indigenous people. The pattern is almost similar to the other research results on the Pulau Lakkang [16], the Baduy Dalam [19] and the Sasak Sade [21] indigenous peoples.

The elements are generally not fully written in traditional texts, either in the *Dou Mbojo* indigenous people or in several other indigenous peoples [15, 16]. However, the elements can be completed through deeply interviewing the custom leader [5, 20]. When observing the

settlement location, whether these elements still exist and are in accordance with the explanation of the custom leader.

Tabel 2. Landscape elements forming the *uma lengge* settlement landscape

No.	Features/Basic elements	Elements	Existence of the elements			Location
			SL	TA	OT	
1.	Man-made Feature:					
	a) Landform	(1) Public open space	-	●	●	inside
	b) Buildings	(2) *uma lengge*	●	●	●	inside
		(3) mosque	●	●	●	outside
	c) Plants	(4) hedge plants	-	●	●	inside
		(5) paddy	●	●	●	outside
		(6) farm plants	-	●	●	outside
	d) Pavements	(7) road	-	●	●	inside
		(8) pathway	-	●	●	outside
	e) Site structures	(9) wall	-	●	●	inside
2.	Natural Feature:					
	a) Plants	(10) forest plants	●	●	●	outside
	b) Water	(11) river	●	●	●	outside
		(12) springs	●	●	●	outside

Notes: LR = Literatur Review; CL = Custom Leader; SO = Site Observation (Source: [2, 17, 20])

Man-made Feature

Uma lengge has a special character, as mentioned above in relation to the term lengge. The form of the roof is pursued and overhangs far beyond the upper walls. The cross shape at the top of the roof has a philosophy taken from Minangkabau culture. Based on history, the *Dou Mbojo* tribe once visited the Minang community (West Sumatera) and held buffalo fights. The Minang people won the battle, so they changed their name to Minangkabau (means winning the buffalo fight). This victory was immortalized on the roof of the community's traditional building which resembles buffalo horns, it was called *Rumah Gadang* (means big house) [5]. The *Dou Mbojo* community also adopts buffalo horns in the architecture of their traditional house, but unlike the Rumah Gadang, that is, only the two ends of the roof of the house symbolically resemble buffalo horns. Such characters appear in several ethnic tribes throughout the Sumatra region with different philosophies [22, 23].

The *uma lengge* is a stilt house actually consisting of two floors. The house is supported by four main pillars made of wood. The first floor is a stage with a height of around 0.5–1m which functions as a place to receive guests or sitting around. This floor is open without walls so that views can be directed to all directions [18]. Below the floor is left empty and open (Fig. 3), this is intended to avoid rat pest attacks.

The second-floor functions as a family room as well as paddy barn. To enter the second floor, you have to go through the front roof door (west side) using the stairladder. The stairladder is not permanent, it can be lifted. If the door is closed and the stairladder is not installed, then this indicates that the occupants of the house have not been there for quite a long time. However, if the door is closed and the stairladder is still installed, this indicates that the occupant is not there but will return in the near future, usually within the same day. On this floor, residents rest to sleep or cook. The walls of the second floor are covered by the roof of the house with only one door or window. Above this floor, still in the family room (under the roof), there is a third floor that functions for storing agricultural harvests, especially rice and tubers. On the third floor, there is also a traditional ceremony to show gratitude to God the Creator who has provided good and abundant harvests. The harvest ceremony is almost carried out in various traditional cultural communities. The layout and architecture of *uma lengge* provides privacy and optimal use for its residents [18]. This is in line with research by *A.*

Ghaffarianhoseini [3] who concluded that what residents of traditional houses feel most about is optimal use with high privacy values.

Fig. 3. Architecture of *uma lengge*

Materials of *uma lengge* house are natural materials such as wood and reeds. Wood is used for the main pillars (four pillars), floors, stairs and ceilings. The house roof and the door are made from reeds. A house made from these materials makes the residents feel comfortable from the heat of the sun and the cold of the night [18]. Traditional house forms and materials generally respond well to the local climate and disasters providing security and comfort for local communities [9, 24-26].

Road and Pathway

Accessibility from the province road to the *uma lengge* settlement is very easy, because it is via asphalt road. The road passes through current community settlements. and local circulation which is the path of residents in the settlement. With this well-maintained accessibility, the existence of *uma lengge* can be maintained well as a conservation effort. Accessibility to the *uma lengge* settlement is not as difficult as accessibility to inland or border communities [27].

Pathway is a road that connects one *uma lengge* with another *uma lengge* within the settlement. The width of this pathway is sufficient for two people to pass each other safely. Original pathway is a rocky road without cement or asphalt. Stone materials are very commonly used in traditional settlements with local wisdom [24]. During its development, the road was cemented so that it looked much neater but had a less natural impression and was less harmonious with the traditional character of *uma lengge* (Fig. 4). The position of the *uma lengge* pedestal stones are higher than the pathway, so that there will be no flooding influence on the pedestal stones and it is also resistant to earthquakes. Traditional houses are generally more earthquake resistant than contemporary houses [28].

Original pathway Cemented pathway

Fig. 4. Pathway within the settlement.

Public open space

Public open space of the *uma lengge* settlement is located just after entering the gate (Fig. 4). The open space is large enough to accommodate the residents to come togather as a whole. Other functions are a place to receive guests and to carry out traditional ceremonies, especially *Ama Fare* ceremony during the traditional harvest time which displays various kinds of traditional arts and dances of the *Dou Mbojo* community. The *Ama Fare* is a traditional ceremony for uploading rice to *uma lengge* and it is carried out only once during simultaneous harvest. Open space in a settlement is a necessity. In several traditional settlements, open spaces always exist in different sizes, but their main function is relatively the same, namely important traditional ceremonial activities for the community [15, 29]. The traditional settlement of the *Baduy Dalam* indigenous community has an open space (called as *alun-alun*) located between the custom leader's house, right-hand man house and small hall [19]. Minangkabau traditional settlements also have an open space called *Medan Nan Bapaneh* with the function for gathering the kampoeng custom leaders to decide on a matter and the public people can witness it [15]. In traditional settlements of the Buton indigenous people, open spaces or squares are located between the mosque, palace and market and the function is the same [29].

Settlement border

The *uma* lengge settlement is bordered by a wall to ensure it is safe from various unwanted things, such as wild animal attacks, theft and so on. Currently the border is a wall, but previously the border was a bamboo fence accompanied by hedge plants, especially *rui rangga* or bidara plant (*Ziziphus mauritiana* Lam.) and jatropha plant (*Jatropha curcas* L.) which the oil is used to light lamps. Bidara has good benefits for the local community, including being used in traditional ceremonies to expel jinn from entering humans. Another plant planted in the *uma lengge* settlement area is banana (*Musa* sp.). Bananas are usually planted at the back of the settlement at the border of the wall. This banana plant is often used in traditional ceremonies.

Rice fields and dryland farm

Rice fields and dryland farm area are landscape elements of man-made feature that are very important in their life, because of their main livelihood. Rice fields were built by maintaining the natural landform (terracing). The traditional rice planting process in the *Dou Mbojo* community is carried out with traditional ceremonies and accompanied by traditional songs to encourage the rice planters [30].

The dryland farm area of these indigenous communities also maintains natural landforms, although there are minor changes to maintain the ecological environment, such as making earthen mounds to prevent soil erosion. The gardens are located around the *uma lengge* settlement with farm products including coconut (*Cocos nucifera* L.) and areca nut (*Areca catechu* L.). Betle (*Piper betle* L.), moringa (*Moringa oleifera* L.) and turi tree (*Sesbania grandiflora* L.) are usually planted around settlements. In the 1970s, coconut resources had greatly decreased, so according to tradition it was stipulated that those who were getting married were required to bring a pair of coconut seedlings and plant them around their house.

Natural Feature

Forest

The forest has an important value for the local people's lives, especially for building the house. Building materials carried out from the forest are wood, reeds and so on. As time goes by, the use of reeds is reduced and replaced with tiny or tile roofs. It caused the source of reeds in the forest is difficult to obtain anymore. The forest in the *Dou Mbojo* community does not have sacred value as in the *Baduy Dalam* community [19]. There is no forbidden forest for the *Dou Mbojo* community. There is no forest clearing, except based on customary decisions and only for residential needs and rice fields.

Water springs and river

Water is a very important resource in human life. Local people prioritize water, both for consumption and for irrigating the rice fields. The main water source that has been available since ancient times is *Oi Wobo*, a place with water springs (*Oi* means water and Wobo means *stick* or *water bubble*). The water spring's location is far from the *uma lengge* settlement. Currently, the *oi wobo* area is used as a tourism area, such as a resort with swimming pool, Pasanggerahan Wawo [31-33]. The river that crosses Mariah village, Wawo District, is the *Oi Wobo* River. The name of this river is very closely related to the history of the Pesangerahan. Some of the rice fields are irrigated by *Oi Wobo* rivers, however the others are rain-fed fields.

Landscape model of the uma lengge settlement

Layouting the landscape elements of the *uma lengge* traditional settlement forms an interesting pattern. The pattern is formed involving the natural and man-made features [2, 8]. The settlement is located in an area surrounded by supporting elements of the settlement landscape (Fig. 5). This pattern is included in the category of *nucleus pattern* according to Morris [34], where the *uma lengge* settlement is the core and agricultural land and gardens are the plasma. In the *uma lengge* settlement, the houses are located in a row and oriented towards the Qibla (northwest direction). The *uma lengge* entrance door always faces the Qibla, which is the direction of Muslim prayer. The direction of the settlement is similar to the others traditional settlement in Indonesia such as Minangkabau community [15]. Current community settlements are generally located around the *uma lengge* settlement (southwestern).

The landscape elements of the *uma lengge* settlement, including both natural and man-mad features, can be categorized into two categories, namely objects and space. The elements included in the object are *uma lengge* (house), prayer room, wall, road, pathway, gate and water springs. The elements that fall into the space category are drying land or open space, rice fields, farm dryland, forests and current community settlements. The relationships between the elements forming the *uma lengge* traditional settlement landscape (objects and spaces) is shown in Figure 6. In this picture the round marks represent physical proximity. Proximity distance is categorized into three categories, namely close relationship (black), somewhat close relationship (gray) and distant relationship (white). The letters A to G describe the nature of the relationship between two objects/spaces with different functions based on Motloch's criteria [8], namely: (A) contained (located in the same space), (B) continuous (open relationship between one object/space with others) (C) interactive (there is interaction between objects/spaces), (D) adjacent (locations of objects/spaces that border each other but are not directly connected) (E) extended linked (between objects/spaces that are far apart but there is something connecting

each other), (F) remote (far apart and nothing connecting them) and (G) separated (far apart and not connected at all, there is a strong barrier that separates them).

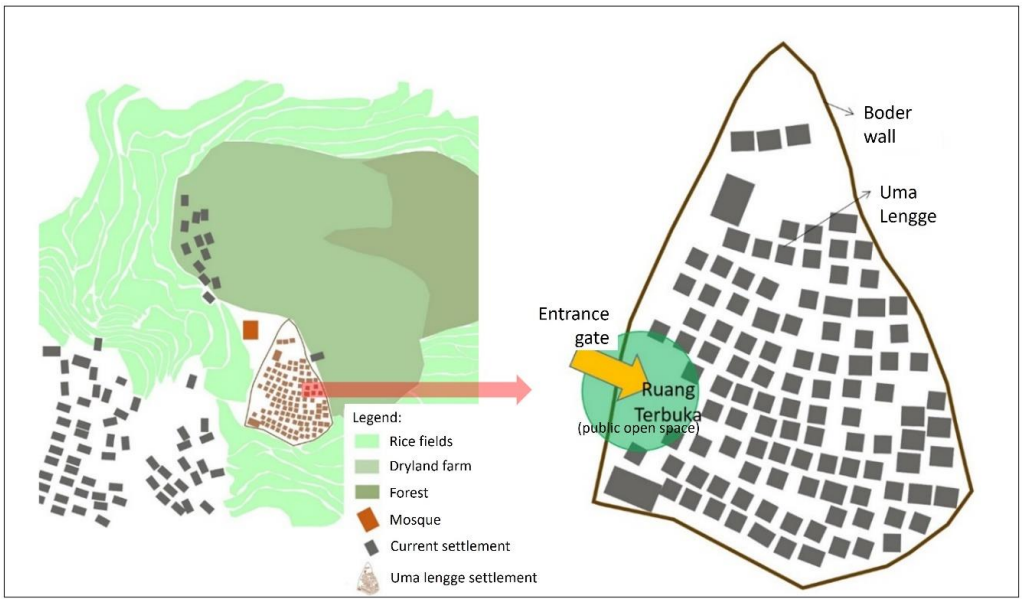

Fig. 5. Elements forming the *uma lengge* settlement

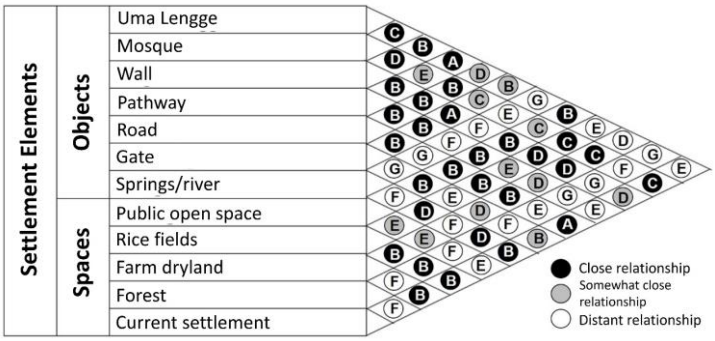

Fig. 6. Space and object relationships

The landscape pattern of the *uma lengge* settlement can be formulated into a concept as as shown in Figure 7. In this figure, the relationship between one element and other landscape elements can be seen spatially. In the settlement, each *uma lengge* is connected by a pathway that ends at the public open space (drying area) close to the gate. The daily activities of the *uma lengge* residents include working in the rice fields, farm dryland and forests. For worship activities (prayer), people can do it in the mosque, which is located outside the *uma lengge* settlement, not far from the gate.

This pattern forms a stable traditional landscape system, closely related to the behavior of the indigenous people who occupy it. A landscape system based on agriculture in general (agriculture-based) with very supportive customary rules, mutual cooperation and working together to solve problems of indigenous peoples and the environment, as well as preserving nature/forests as a natural resource that is really needed by the community. The totality of the *uma lengge* settlement landscape shows functional traditional aesthetics and still holds many

traditional secrets that need to be studied in more depth as researchers in various parts of the world conduct research related to traditional settlement landscapes [7, 35-39].

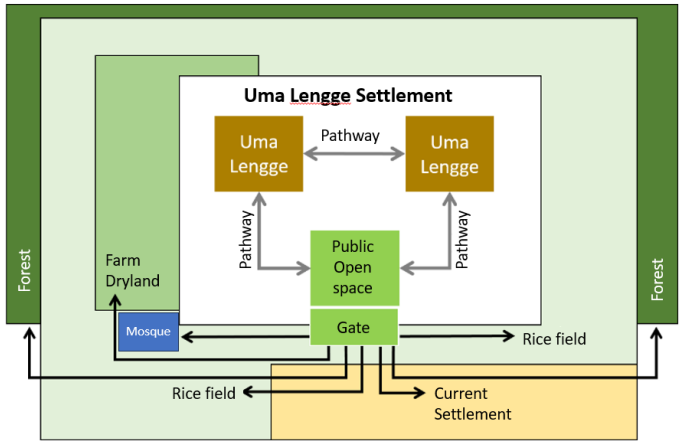

Fig. 7. Conceptual landscape model of the *uma lengge* settlement

Sustainability of the model

The *uma lengge* settlement is under the supervision of the Saratua Council of Bima Mariah village. The Council directs custom-based *uma lengge* activities so that they do not have changes. The traditional leader is elected openly by the community, not appointed based on seniority, or passed down to their children/grandchildren. However, to be elected as leader of the Saratua Council, three main requirements must be met, namely custom elders, must be *ngusu waru* and understand the customs of Bima in depth. The definition of *nggusu waru* in this case is eight requirements that must be fulfilled by a prospective leader, especially a custom leader, namely: (1) have faith and piety (*ntau maja labo dahu*): be ashamed of doing something that violates the law or is known as faith and piety; (2) have a good house (*ntau uma taho*), or in other words a house whose front door is always open; (3) have a strong and sharp weapon (*ntau iron taho*); (4) must have a good vehicle (*ntau jara taho*) and currently there has been a shift by replacing it with the ability to communicate both up, down and sideways; (5) having a good or *sholihah* wife (*ntau wei taho*); (6) a house that is clean and open to its guests (*mbeca wombo nira sarei*); (7) descendants of good people (*londo dou taho*); (8) perfect (*ruku ro rawi*), perfect in movement and work or knowledgeable and authoritative in the work environment [40]. It is believed that these requirements can carry out the mandate of leadership and maintain the customs and culture of the *Dou Mbojo* Bima Mariah.

Customary activities can be reflected in the structure of the Council, especially in its sections such as the Traditional Arts Section, Customary/Marriage Law Section, Conflict Section, Agriculture and Water Resources Section and Forestry Section. The Forestry Section supervises people's activities in forests that are based on the customs, such as the rule that forests cannot be cut down and built on without permission from the Saratua Council. Determining forest areas is also the authority of this section, as forests can be used as buffalo breeding areas. The overall activities contained in the Saratua Council of Bima Mariah program include traditional and cultural activities, traditional ceremony activities, arts and cultural activities, activities related to local wisdom and activities related to traditional home industry [41]. The people of Bima Mariah village are very obedient to the traditional rules and decisions

of the Saratua Council. With the existence of an assembly and customary rules within it, the sustainability of the *uma lengge* settlement landscape can be maintained properly.

Conclusions

The landscape character of the traditional *uma lengge* settlement of the *Dou Mbojo* indigenous community, Mariah Village, Bima, West Nusa Tenggara, is formed by landscape elements which were categorized into natural landscape features and man-made features. The settlement landscape elements that fall into the natural features category include landforms (terraced rice fields, farm dryland and forests), plants (rice, dryland and forestry plants) and water (water springs and rivers). Landscape elements that fall into the category of man-made feature include building elements (*uma lengge*, mosque), plants (dryland rice, forest, dryland and hedge plants), pavement (roads, pathway and public open space areas) and site furniture (wall).

The landscape model of the traditional *uma lengge* settlement is in the form of a nucleus pattern with the *uma lengge* settlement as the core. The orientation of the settlement is indicated by the *uma lengge* door facing the Qibla. The relationship between objects and spaces forming the settlement landscape is very efficient and effective for the daily activities of the people living in the *uma lengge*. The relatively ideal settlement landscape model is supported by strong traditional institutions and preserves their own environment and culture.

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