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SUSTAINABLE LANDSCAPE FOR LIVABLE VILLAGE IN MANDAILING

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ABSTRACT

The landscape of Mandailing village has been planned and designed naturally by its people following the old traditions of the ancestor and still exists until now. It raised the question about the system of sustainable landscape of Singengu in forming Mandailing as livable village. This rationalistic research reveals the phenomenon of *Huta Induk* in Mandailing, namely Singengu, which is preserved until this time as a sustainable village. The qualitative and descriptive methods were used to establish the indicators regarding how the *Huta Induk* made a sustainable landscape for livable villages by using a theory of sustainability which stands on three general corners: environmental, social and economic aspects. The result showed that the sustainable landscape in Singengu as *Huta Induk* village, consists of three systems, namely 1) land management (environmental, economic and spiritual aspects); 2) the ordering or arranging of landscape elements (social, cultural and spiritual aspects) and 3) the application of local values on landscape villages (spiritual aspects). Land management has been done by *rarangan* (prohibition) tradition in some places such as in river and forest. The ordering of landscape element has been done by using the concept of binary space, such as elderly-young, old-new, up-bottom, front-backside, man-woman, and senior-junior. The application of traditional value is shown by the setting of the market place in the secret area of village landscape. Sustainable landscape in Mandailing has been creating the livable village based on *bincar-bonom* concept and full of meaning for the local people.

Keywords: *Huta induk*; Land management; Livable village; Local value; Sustainable of *bincar-bonom* landscape.

1. INTRODUCTION

Nowadays, the issues about sustainable not only addressed the sustainability of urban area or cities but also the coastal area, rural area and villages. Sustainability of urban area or cities is one of the most familiar issues which have been found among others. However, most landscape areas in the world have their own character, so the essence of the landscape cannot be discovered by using general approach. For example, we cannot discover sustainable landscape of a village by using the theory of sustainability of urban area or cities. Exploring the richness of a landscape area requires an understanding of the contexts more comprehensively.

Researches about sustainable landscape with diverse background have often been studied until this time. These indicated that sustainable landscape in every place must be revealed in order to find a new knowledge, especially local knowledge of the local people.

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The studies on sustainable landscape focus on sub-urban (Weller, 2008) by considering the application of principles of landscape urbanism to suburban landscape in order to help the landscape architects to play a more influential role in shaping the contemporary patterns of the urban sprawl. These studies are based on the theory and practice. Other studies on sustainable landscape focus on urban based on an approach for assessing and appropriating indicators (Amin, 2012); implications of philosophy (Chen & Wu, 2009; relationship between urban farm and local communities (Poulsen, and Spiker, 2014); healthy, attractive and sustainable places (Siöström P and Sternudd C, 2011), investigation of human factors for better design in all scales of landscape architecture (Toofan, S., 2014) and many more.

The other studies on sustainable landscape focus on coastal area based on the application of the principles for livable communities to propose the guidelines for solving the environmental impacts (Bangsuk J, Phongphanich N and Cheng T, 2014). There are two studies on sustainable landscape focus on village, first, based on implementations of sustainable development principles (Borsos B, 2013); and second, based on applying urban planning principles for creating the ideal small settlement on big village (Mohsen S., 2012). All the studies or research about sustainable landscape as described above showed that researches focus on village were still very limited. Most researchers have not specifically observed the sustainable landscape for the livable village.

In Indonesia, there are many such villages which can offer a greater landscape especially in Mandailing North Sumatera. Some observations and researches on villages in Mandailing showed that there is an interesting landscape phenomenon that has guided its making. In Singengu village the spatial arrangement has been related to *bincar-bonom* concepts at three different scales (Nuraini C., Djunaedi A., Sudaryono, and Subroto T.Y., 2014a). At the micro scale, the pattern of house formation is an intentional consciousness of *bincar-bonom* concepts (Nuraini C., Djunaedi A., Sudaryono, and Subroto T.Y., 2014b). By referring to the term of sustainability especially about the three aspects of it, so in this research the three general corners of sustainability (environmental, social and economic) will be discussed. Through this research, the new aspect of local knowledge as a part of sustainable landscape to make a livable village will be found and also, the changes in the future can be anticipated.

The research presented in this article examined the system of sustainable landscape of *Huta Induk* in Mandailing Village (Singengu) and how it has become a tool to make livable village for the local people. It raised the following question: what is the system of sustainable landscape of Singengu in forming Mandailing as livable village? The study aims to find a sustainable landscape system in Mandailing village for creating the livable village. This research will be contribute to the enhancemet of the term of sustainability for the architectural landscape and will especially increase the understanding of Mandailing tribes living culture.

2. METHODOLOGY

This research uses descriptive qualitative inquiry with grounded theory methodology. Grounded theory methodology rigorous set of procedures for producing formal, substantive theory of social phenomena. It requires a concept-indicator model of analysis which in turn employs the method of constant comparison. Empirical indicators from the data are compared in order to search for similarities and differences. (Schwandt, 2001; Howell, 2013, Groat and Wang, 2002). The essence of research

problem of grounded according to Schandt (2001), Howell (2013), Groat and Wang (2002) should emanate through works or ideas generated through previous studies, issues that have become apparent following the writing of a report, essay or academic paper.

This research started by exploring the two sampling theory through the previous studies. First, the theory of sustainable landscape and second, the substantive theory about landscape of Mandailing settlement. Some theories of sustainable landscape that are used in this research are sustainable landscape planning (Ahern, J., 1999 in Tress, B., Tress, G., Fry, G., 2004), sustainable landscape (Selman P, 2008), sustainable landscape architecture (Chen and Wu, 2009), an approach for assessing and appropriating sustainable landscape (Amin A, 2012) and design for sustainable landscape (Tofan S, 2014). The substantive theory about landscape of Mandailing settlement is about *Bincar-Bonom* concept (Nuraini et al, 2014a).

2.1. Research Location

Research location is Singengu village. Singengu is a village with a status of *huta induk* (mother village) which is located in Kotanopan sub-district, Mandailing Julu area, North Sumatera Province. Singengu village area does not have clear administrative boundaries because the people still use the customary land system. This phenomenon is unique because a village with no clear boundaries still exists as a livable village since 750 years ago until now.

2.2. Research Process

According to Schandt (2001), Groat L and Wang D (2002), Howell K.E (2013), this research is conducted through several phases. They are 1) research design phase; 2) data collection phase; 3) data ordering phase; and 4) data analysis phase.

2.2.1. Research design

In this phase, researcher has to review some technical literatures to create a definition of research question and finally, arrange the theoretical sampling as theoretical framework. This step aims to constrain the irrelevant variation and to sharpen external validity. In this research, the theoretical framework was built by arranging the sustainable landscape theories of Ahern, J., (2004), Shelman P., (2008), Chen and Wu (2009), Amin A.M., (2012), Tofan S., (2014) and Nuraini et al (2014a).

2.2.2. Data collection

In this phase, there are two steps that have been done. Step one, developing rigorous data collection protocol by creating the case study database and step two, entering the field. Creating the case study database aims to increase the reliability and construct the validity of Singengu as case study to reveal the sustainable indicators of Singengu village. By entering the field, the investigator will take advantages on the emerging themes and the unique case features. For Singengu, the emerging themes and the unique case features are the place of divider and the prohibition place.

2.2.3. Data ordering

In this phase, data was ordered by arraying events chronologically. This phase aims to facilitate an easier data analysis and allow the examination of the processes. In this research, researcher uses the theoretical framework as research guide when ordering data.

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2.2.4. Data analysis

In this phase, the first step is analyzing data related to Singengu village case by using open coding (to develop concept, categories and properties); axial coding (to develop connections between a category and its sub-categories); and selective coding (to integrate categories to build a new theory/local theory). Second step is analyzing data related to theoretical sampling to confirm, extend and sharpen the theoretical framework.

3. RESULT

3.1. Sustainable Landscape Architecture

The term of sustainability is defined in many ways. First, sustainability is a broad term that generally means that a person or society lives within the means of what the earth can provide over a long term (E.Chan and GKL. Lee in Toofan S, 2014). Toofan (2014) also described that when a process is sustainable, it can be carried out over and over without negative effects on the environment or without a high cost. Second, sustainability meets the needs of the present without compromising the ability of future generations to meet their own needs (United Nations World Commission on Environment and Development in Toofan S, 2014).

Meanwhile, other researcher described that the term sustainable includes an activity that intends on integrating the three sectors across social, economic and environmental area (Ahern, in Tress et al, 2004). Ahern (in Tress et al, 2004) described that as a theory, sustainability stand on three general corners, they are environmental, social and economic. These three corners act as different, yet connected elements by which sustainability is quantified and studied through its multidisciplinary contexts. Achieving the right balance and trade-offs between environmental, social and economic aspect for the design product is the ultimate goal. Ahern (2004) addressed the sustainable term at four corridors, namely ecology, habitat, place and humanities. On environmental contexts, the sustainability of an ecology, habitat and place should be seen by optimal land use.

How about the term of sustainable landscape in architecture? Chen & Wu (2009) described that sustainable landscape architecture will be created and achieved by integrated landscape ecology and landscape architecture. Landscape architecture intentionally modifies and creates landscape of different kinds and various sizes. Landscape architecture is an interdisciplinary enterprise that inherits traditions of the past, creates reality in the present and anticipates changes in the future (Chen and Wu, 2009). Thus, to discover sustainability of a landscape the investigator has to reveal the phenomenon on past, present and future.

Selman P (2008) described that sustainable development is generally considered to be at the intersection of environment, economy, and society, although these terms are now often expanded into phrases reflecting ecosystem services and limits, fair and durable prosperity, and health and social justice. Thus, the dimension of sustainable landscape considers the environment, economy and society. The economic sustainability of landscapes has often been expressed as the maintenance of attractive scenery to support tourism and recreation, and social sustainability in landscapes is often addressed in terms of participation and inclusivity in decision making and access.

Amin (2012) explained that sustainable urban landscape encompasses more than ecological concerns. Although ecological concerns and adapted technologies are mostly connected to sustainability, sustainable urban landscape has to appropriate other

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intangible dimensions. Thus, there are several aspects considering the sustainability of urban landscape. These aspects are differentiated between aesthetics, functionality, environmental awareness, cost effectiveness and maintainability. These aspects are also associated by other concerns such as social and communal interactions. Sustainable urban landscape is a state of balance and complementation between these aspects all together in order to enhance the contextual environment and to raise the quality of life.
The other studies about sustainable landscape focusing on livable communities have been done by Bangsuk J, Phongphanich N and Cheng-Fa (2014). It discussed about the application of ten principles for creating the livable communities in a coastal community.
In term of sustainable development, the principles have been focusing on the future to sustain human society within the contexts of the natural environment and urban landscape. Theoretical orientations about the development of sustainable landscape concepts can be seen in Figure 1.

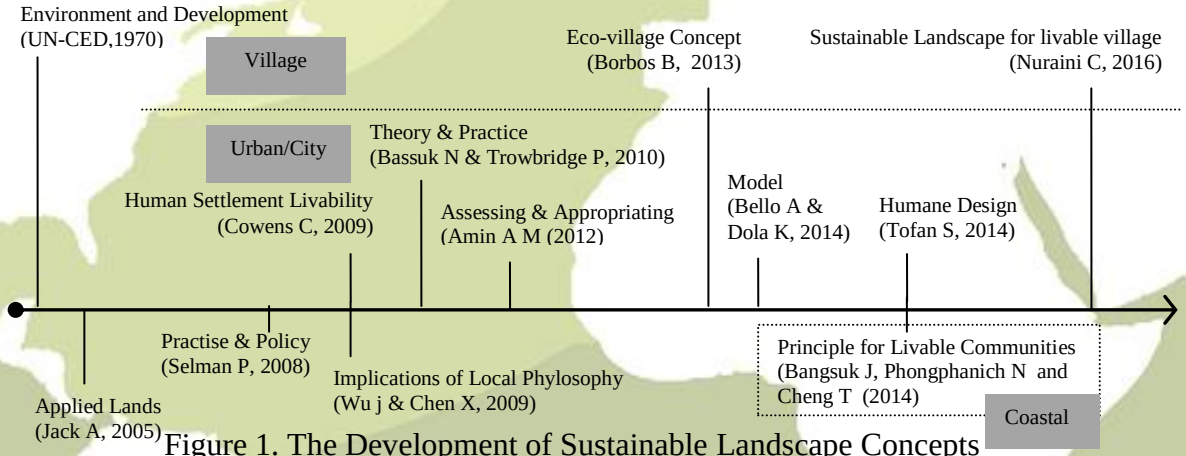

Figure 1. The Development of Sustainable Landscape Concepts
(Source : Analysis, 2016)

The implication of sustainable landscape architecture in Singengu village was influenced by landscape ecology which is concerned with spatial patterns and processes. It inherits traditions of the past, creates reality in the present and anticipates changes in the future as Chen and Wu have described (2009).

3.2. Livabel Village

Other studies on Singengu village settlement focusing on Singengu landscape have often been studied based on *bincar-bonom* concept. *Bincar-bonom* is a local theory of Singengu village settlement that has become a principle guideline in arranging living space in the residential areas (Nuraini et al, 2014a). *Bincar*, which means sunrise and *bonom*, which means sunset are not merely terms to indicate the directions of sunrise and sunset but have become the base of forming Singengu village spatial plan which is empirically translated in the form of placement, setting or location of physical elements of settlements in the three spatial scales in such away. Thus, it is always on the *bincar bonom* axis with an emphasis on three important relations, i.e. the relation between people, present day people to the ancestors, and all people to the Creator. As a local theory, *bincar* is identical with youth, junior and new, while *bonom* is identical to the

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aged, senior and old. For example, the application of *bincar-bonom* is illustrated in Figure 2.

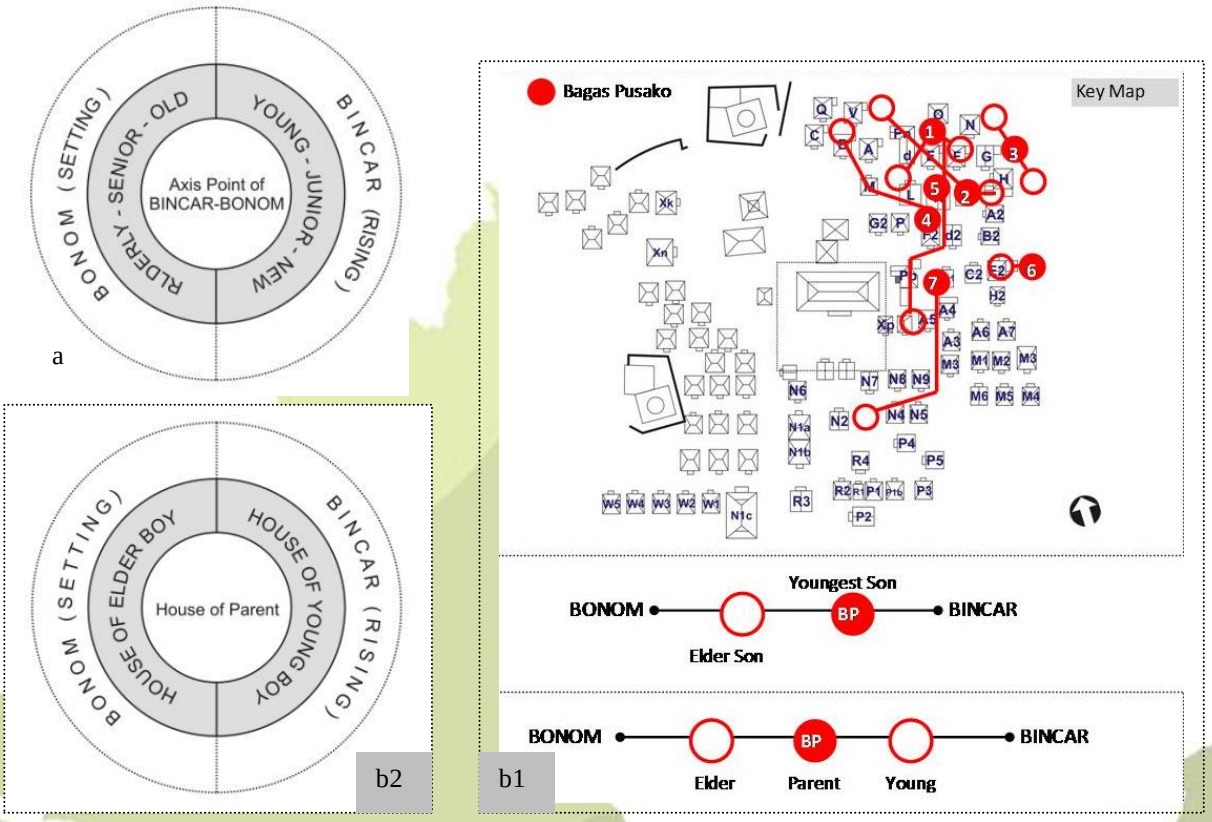

Figure 2. (a) the local theory of *Bincar-Bonom*; and (b) application of *bincar-bonom* on house spatial arrangement in Singengu village landscape
(Source : Nuraini, et al, 2014a)

4. DISCUSSION

Theoretical orientation showed that sustainable landscape in architecture is considered to continuity of ecology not only the spatial pattern but also its processes. Sustainable landscape in architecture has to intentionally modify and create a living space as required by the people not only in the past but also at the present and for the future. All the theories revealed that the sustainable landscape architecture must be **integrating** three systems, there are environmental, social and economic. Its three systems have been focused on the future to sustain human society within the **contexts** of the natural environment not only appropriate for the tangible dimension but also **intangible dimension**.

Local theory showed that the nature of a village can be formed spatially by symbolic pattern as intangible dimension. It has been a guide and at the same time has been a guide to develop a village up until now. In the case of Singengu village, the core existence of village is an extending space landscape from the direction of *bonom* to the direction of *bincar*. Sustainable landscape ideas generated through previous studies have developed the theoretical frameworks, there are:

1. Sustainable landscape for livable village is considered to integrate the environmental, social and economic systems in the past, present and future.

2. Sustainable landscape for livable village is not only appropriate for the tangible dimension but also for intangible dimension within the contexts of the natural environment.
3. Sustainable landscape within the contexts of the natural environment has local system as origin of knowledge of human society beyond the three (environmental, social and economic as tangible aspects) that formed livable village (cultural and spiritual as intangible aspects).

4.1. Sustainable environment of Singengu landscape

Village living environment of Singengu is composed of three places; there are 1) the place for living; 2) the place of assembly; and 3) the present place. All of the places were scattered in unique layout with *bincar-bonom* application of site planning. The setting of place for living is in the center of village as residential communities. It was defined in two of houses; there are parent's house and children house. Parent's house is always at the directions of *bonom*, while children houses are at the direction of *bincar*. The setting of place for assembly was defined in two categories; there are a place assembly in residential area and place assembly in the outside of residential area. The place assembly in residential area defined in two categories, there are place for women in the direction of *bincar* and place for men in the direction of *bonom*. The place assembly in the outside of residential area is the traditional market which located in the direction of *bincar* of residential area. It uses for an assembly place for not only all of the people in Singengu village but also the neighborhoods. At present, Singengu is a livable village for new generations of Mandailing people and in the past it was *tor* (mountain) as the ancestral Singengu people. The setting of Singengu village is also in the direction of *bincar*, while the ancestral place is in the direction of *bonom*. The decision of Singengu ancestors in the past in choosing the location of Singengu as a place for living in the direction of *bincar* landscape also showed an awareness of environment concept of their settlement.

4.2. Sustainable of social system of Singengu landscape

There are two places in Singengu village which aware of social system, there are 1) the place for *huta* founder; and 2) the place of *huta induk-huta anak*. *Huta* founder are *Dalihan Natolu* (the three social bases), there are *kahanggi*, *mora* and *anakboru*. Group of Kahanggi as a forerunner of the leader (king) and senior is placed in the direction of *bonom*. Group of *anakboru* as a junior is placed in the direction of *bincar* while *mora* (as king's father in law) as a group of most respected families and act as advisor are placed in *tonga* (middle) between *anakboru* and *kahanggi* families. The place for *huta induk-huta anak* is developed to the direction of *bincar* and *bonom*. Singengu is *Huta induk* (parent *huta*) and as land of birth, Singengu has some *huta anak* (*huta ruar* or place for live after getting married) which are developed to the direction of *bincar-bonom*. Young child made a new village toward *bincar*, while the older children developed *huta ruar* to *bonom* direction.

4.3. Sustainable of Economical system of Singengu landscape

There are two places in Singengu with awareness of economic system; there are 1) the place of worship; and 2) the prohibition place. Worship places for men and women are in the different area in Singengu village. Worship area of men are : 1) the field which is located in prohibition forest in the direction of *bonom* and some other areas in the

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direction of bonom, as local people called 2) *lopo* (small coffee shop); and 3) in the river (especially at bonom part) to pan for gold. Worship areas of women are: 1) wet rice field which is located in the direction of *bincar*; 2) in the river (especially at *bincar* part) to pan for gold.

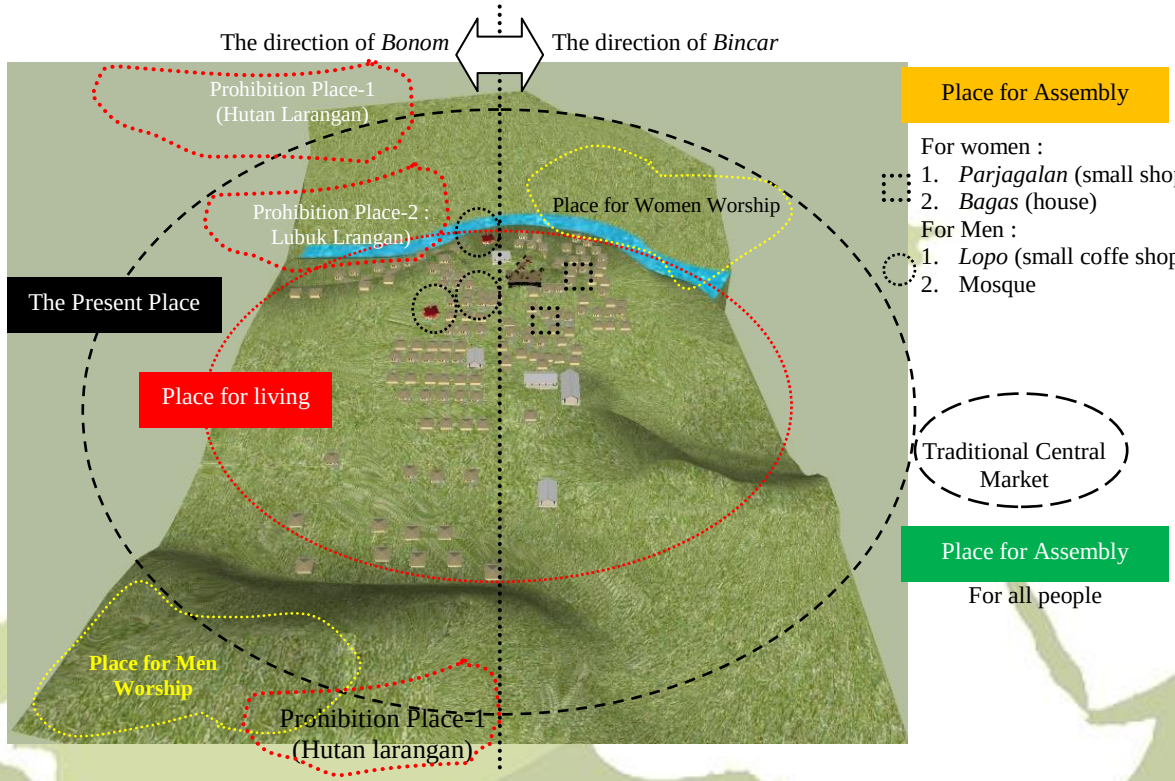

Figure 3. Integrating the environmental, social and economic aspects of sustainable landscape for livable village in Singengu

5. CONCLUSION

Theories related to the aspect or systems of sustainable landscape have asserted that on environmental context, a place should be seen by optimal land use. In Singengu, land use of village landscape especially spatial order of the village elements have awareness not only to the environment aspect beyond three places as described above but also economic aspect with the organization of the different places of worship for women and men as economic space. The different aspect of sustainable landscape as specific findings in Singengu is spiritual awareness of *bincar-bonom* concept. The concept always relates to the reality of human being and Singengu people lives. Thus, sustainable landscape in Singengu consists of environmental, social and spiritual aspects. It can be called as the land management by applying the local concepts to arrange all of village elements. Actually, for example land management has been done by *rarangan* (prohibition) tradition in some places such as river (it called *lubuk larangan*) and forest (*hutan larangan*). It becomes the first aspect of sustainable landscape in Singengu.

The second is about ordering or arranging the landscape elements, such as some places in Singengu. There are seven places in Singengu which have been arranged by *bincar-bonom* concept and created a binary space. *Bincar* direction is a symbol of the future, direction for the young, junior and something new; while the *bonom* direction is a

symbol of the past, direction for the elderly, seniors and something old. It has guided Singengu landscape with binary space such as elderly-young, old-new, up-bottom, front-backside, man-woman, and senior-junior. In this context, sustainable landscape of Singengu not only consisted of social aspect by creating social space based on characteristic of Singengu people, but also cultural and spiritual aspects by arranging all of places with *bincar-bonom* concept.

The third is about the application of local value on landscape villages as the spiritual aspect. It is the key of research finding which is very different with other places in the world. In Singengu village, the secret area is located in *bincar* direction and Singengu people have placed the traditional market in *bincar* area. Traditional market or *poken* in Singengu village is considered as a secret place because of the historical background in which the function of market land in the past was as the first place inhabited by the ancient people when they came down from the mountain ranges.

Finally, the sustainable lansdcape of village area are not only considered for the environmental, economic and social aspects but also spiritual aspect especially in Singengu village. The nature of Singengu landscape spatially is formed by symbolic pattern of *bincar-bonom* and at the same time has created the symbolic space that regulates the relationship between the older and the younger, the old and new, the man and woman. The symbolic pattern has become a guide to develop Singengu village up until now. Thus, the landscape of Singengu village from the past to present shows a woven-continuity and it explicitly revealed about the system of sustainable landscape of Singengu in forming Mandailing as livable village.

6. REFERENCES

Amin, A., Mohamed .(2013), Sustainable Urban Landscape : An Approach for Assessing and Appropriating Indicators, *International Journal of Architectural Research*, Vol. 6, Issue-2, July 2012, pp. 98-114, Archnet-IJAR.

Bangsuk Jantawan, Phongphanich Nara and Cheng-Fa Tsai C (2014), Applying the Principles for Livable Communities. *American Journal of Environmental Protection*, Vol.3, No. 4, 2014, pp.179-184, doi : 10.11648/j.ajep.20140304.12.

Borbos, B., (2013), The Eco-Village Concepts in a Model Experiment in South-West Hungary, *Journal of Settlement and Spatial Planning*, Vol. 4, No. 1, 2013, pp. 69 – 76.

Chen, X., and Wu, J., (2009), Sustainable Landscape Architecture : Implications of the Chinese Philosophy of "Unity of Man with Nature" and Beyond, *Journal of Landscape Ecol*, Springer, 2009, 24 : 1015-1026, DOI 10.1007/s10980-009-9350-z.

Groat, L and Wang, D., (2002), Architectural Research Methodes, Jhon Wiley & Sons Inc., New York.

Howell, K.E., (2013), *An Introductions to The Philosophy of Methodology*, Sage Publications, London.

Mohsen, S., (2012), The Nature of Big Villages ans Small Town : Towards Creating Ideal Small Settlements, Journal of Geography and Regional Planning, Vol. 5 (14), pp. 369 – 374, October, 2012, DOI : 10.5897/IJGRP12.031, ISSN 2070-1845.

Nuraini C, Djunaedi A, Sudaryono and Subroto TW, 2014a, Bincar-Bonom : The Basis of Spatial Arrangements of Singengu Village, Indonesia, *Journal of the International Society for the Study of Vernacular Settlements (ISVS e-journal)*,

Vol.3, No.2, December 2014.

Nuraini C, Djunaedi A, Sudaryono and Subroto TW, 2014b, Bincar-Bonom as the Basis of House Formation in Singengu Village Settlement, *Journal of Scientific Research and Studies*, Vol. 1 (6), pp.118-130, December, 2014, ISSN 2375-8791.

Poulsen, M.N., and Spiker M.L., (2014), *Integrating Urban Farms into the Social Landscape of Cities : Recommendations for Strengthening the Relationship between Urban Farms and Local Communities*, John Hopkins Bloomberg School of Public Health, USA.

Selman, P., (2008), What Do We Mean by Sustainable Lansdcape, *Sustainability : Science, Practice, & Policy e-journal*, Vol. 4, Issue. 2, pp. 23 – 28.

Siöström P., and Sternudd, C., (2011), Sustainable Urban Design – Making the World's Growing Cities Into Healthy, Attractive and Sustainable Places, *Sustainable Urban Design Journal*, Vol.1, ISBN 978-91-979801-0-4, SUDes Publishing, Sustainable Urban Deign Programme, School of Achitecture, Lund University, Lund, Sweden.

Schwandt, T.A., (2001), *Dictionary of Qualitative Inquiry*, Sage Publications, London.

Toofan S, (2014), Importance of Humane Design for Sustainable Landscape, *IACSIT International Journal of Engenering and Technology*, Vol. 6, No. 6, December 2014, pp.508-512, doi : 10.7763/IJET.2014.V6.750.

Tress, B., Tress, G., and Fry, G., (2004), Integrative studies on rural landscapes: Policy expectations and research practice. *Journal of Landscape and Urban Planning*, Springer.

Weller, R., (2009), Landscape (Sub)Urbanism in The Theory and Practice, *Landscape Journal*, Vol. 27, Vo. 2, 2008, pp. 255-278.