

# The role of culture in implementing the concept of sustainability

**M Bakri**

Architecture Department, Faculty of Science and Technology, Universitas Islam  
Negeri Ar-Raniry, Jl. Syeikh Abdurrauf Kopelma Darussalam Banda Aceh 23111  
Indonesia

E-mail: maysarah.bakri@gmail.com

**Abstract.** Environment degradation urges human to live in a sustaining way both for production and consumption mode. It covers any sector of human life include architecture. People are competing to implement the concept of sustainability using the latest technology while the culture has begun to be forgotten. Bearing in mind that by examining the culture related or daily activities, the sustainable development can be implemented with a solid base and fully accepted by the society. Hence, the benefit of sustainable development can be felt by the inhabitant sooner. The aim of this research is examining the local culture in Banda Aceh, Indonesia, and Gozo, Maltese Islands which has sustainability concept. The local culture can be a starting point in implementing the notion of sustainability through daily basis approach. This research uses the qualitative method and collects the data through observation and literature review. The result has shown that some of the cultures in selected area have sustainability values which can be developed further in term of the implementation of sustainable development. Thus, related to the sustainable development, the practitioners can shift to the deep-rooted local value rather than apply an alien concept in society.

## 1. Introduction

There is an urgent need to implement sustainable concept in any sectors of life as the condition of the environment is worse. Sustainability is a concept that ensures the life of future generation to fulfill their needs while at the same time also provides and meets the current need [1]. This concept shows that any taken action should consider the survival of future generation because the number of resources, especially natural resource used in any development is shrinking. As it covers any production and consumption mode, thus architecture subject also has the responsibility for implementing this concept. In this scope, many approaches have raised to create the so-called sustainable architecture. The concern is to design sustained building or built environment to ensure the quality of life current and future generation.

One general approach is designing the new building or built environment which equipped with the latest green technology, which sometimes creating an “alien” building or concept. This kind of approach starts ignoring the culture which causing the loss of local identity and creating refusal from the society. In fact, local wisdom and the way of life as part of culture contain many values of sustainability. It also improves the quality of life because it involves and requires willingness of the society. The cultural



activities also allow social interaction which will strengthen social cohesion. Therefore, some cultures are sustainable which can be explored further as the basis for the implementation of sustainable development.

On the subject of sustainable development itself, there is a discourse which placed culture as the fourth element, as the mediating element and as a foundation for creating sustainable development [2]. As the fourth component, the local knowledge contributes to the achievement of sustainable development along with other three pillars. Meanwhile, as the mediating element, the local knowledge is in the center and connects the other element. It has a mediating role for possible conflict amongst other three pillars. Furthermore, the third discourse believes that the culture acts as a foundation of sustainable development. It is because the culture shapes the behavior of people in the society. Therefore, it has important role. These three functions place the way of life as a significant component and has values to be considered in sustainable development. The proper way to implement a concept of sustainable development is using the culture as the basis in a holistic way. By doing this method, the culture is included in any consideration regarding the sustainable development.

Culture determines society perspective towards the way of life and creates local knowledge. In some regions, culture acts as guidance and social control in the life. In consequence, it shapes the behavior towards the environment, social and economic life. In the other word, culture affects the society in dealing with sustainable development. As culture is diverse, the sustained value will be dissimilar from one region to another. Thus, based on culture, the implementation of sustainable development in each place should be different. Moreover, the role of culture in sustainable development will also differ based on the habitat. Any cultural based production and consumption mode in domestic setting will contribute to the development of city, shape the pattern of the city and color the urban life.

From the perspective of sustainable architecture, according to Guy and Farmer [3], the culture which labeled as eco-cultural includes in the six competing of it along with eco-technic, eco-centric, eco-aesthetic, eco-medical, and eco-social. Through this logic, the concept of sustainability has indicators which are the cultural context and characteristic, local, in a harmonious and well-adapted to the surroundings. The concern of sustainable architecture from the lens of eco-cultural is not only the environment but the culture also. The existing and local culture is encouraged to be preserved and developed further because mostly culture is sustainable. The culture has manifested in daily life, including architecture. Thus, the culture based production and consumption of space, settlement pattern, building typology, or traditional construction technique should be preserved through negotiation. By using it as the basis for the implementation of sustainability concept, the culture will be preserved and takes part in solving current world issues. Therefore, the culture must be enhanced and integrated into policy level to support that notion [4].

Furthermore, the choice of method is one important thing in implementing a sustainable concept. The unsuitable method leads to the failure of implementation. By considering the benefits and the disadvantages of some methods, the first step to implement the sustainable concept uses bottom-up approach which is more suitable. Frequently, this approach is related to the local knowledge, the way of life or daily activities which arise within the society. The values of local knowledge, respect and consider the aspects of environment, social, economy, and culture. Compared to the top-down approach, the use of bottom-up approach creates no or less friction in the habitat. Through a bottom-up approach, any implementation will have a stronger bond with the society which will result in better implementation. When the basis is settled, the bottom-up should be supported by the policies through the top-down method.

The literature has shown that culture began to be considered in term of sustainable development and sustainable architecture. The sustained values and its power to shape the way of life, places it as an important and decisive element in the sustainable development. Another amazing thing is in some regions; the culture is still continuously done by the inhabitant without any forces. So, cultural based implementation will lead to the success because of the willingness of the society. For those reasons, there is a need to examine and enhance the sustained culture to be used as the ground in implementing the concept of sustainability. In terms of architecture and built environment, the investigation will focus

on any culture based production and consumption of space in the society. It will show that space can accommodate people need, the daily life need since a long time ago. This mode is not a trend which pops up in a certain time and vanishes in another time. In fact, it has roots in the society, cannot be removed and continuously produced and consumed based on the local knowledge. The locations of investigation are Banda Aceh, Indonesia, and Gozo, Maltese Islands. Through the case study, the research will also examine the role of culture in implementing sustainability concept in selected areas. The expected finding is the discovery of sustained culture which can be developed further and used by practitioners as the foundation of sustainability implementation.

## 2. Method

This study is done using the qualitative method. Qualitative method is one of research methods which allows the research done in its habitat, engages the researcher to make a sharp interpretation, focuses on respondent's perspective which places them as the object of research and allows the use of various tactics which suitable with the real situation [5]. As the objective of the study is to examine the cultural based production and consumption of space, the setting should be in a real environment. One of the qualitative method's characteristics is "emphasis on the natural situation" [5] which is suitable for this study. The daily life situation allows the observer to examine cultural production and consumption of space done by the inhabitant without any intervention which results in solid findings. As the focus, the scope of the study is in a domestic setting.

The data are collected by doing both the interactive and the non-interactive engagement. The interactive mode is done through participant observation and face to face interview while the non-interactive engagement focuses on non-participant observation. The collected data is analyzed using the theory of sustainable development regarding the contribution of finding towards the environment, social and economic sector. Moreover, the sustained culture will also be analyzed using the theory of the role of culture in sustainable development to examine which position fits in with the selected area. Finally, the conclusion can be drawn based on the analysis, which leads to the making of recommendation at the end.

## 3. Results and Discussions

As the study uses two case studies, the finding of the investigation will be explained further in two subsections which are cultural based production and consumption of space in Gozo, Maltese Islands, and Banda Aceh, Indonesia. Furthermore, it will also discuss the contribution of the result towards the environment, economy and social pillar.

### 3.1. Gozo, Maltese Island

Gozo is one of the islands of Maltese Island. Located in the Mediterranean Sea, Gozo offers the combination of terraced landscape and limestone building. The agricultural area which equipped with rubble wall, takes place in some of the terraced landscapes. Roughly, the cultivation area covers almost half part of the island which means it is one of the main income for the Gozitans. Another characteristic is the consumption of limestone as the building material. Limestone is one of Gozo natural resources and used in all buildings in Gozo. In fact, it is supported by the government policy to preserve the condition of limestone settlement or building. Although nowadays the number of limestone decreases, they still try to keep the same appearance of the building using the other material. Gozo itself seems to be more rural compared to Malta as the main island of the Maltese Archipelago because the undeveloped areas cover the island. The center of activity takes place around the Parish Church, which label this area as "the urban" part of Gozo. Meanwhile, "the rural" part belongs to the area which is directly adjacent to the undeveloped landscape or agricultural area.

Based on the observation, there is one cultural production and consumption mode in Gozo. It is the culture of gardening in the form of a kitchen garden. Over half of the Gozitan – Gozo's inhabitants, have the kitchen garden [6] whether in large or small scale. In fact, the farmer uses the smaller scale parcels for supporting the household while the owner utilizes the larger plots for the commercial purpose [6].

The culture of gardening or cultivation exists for the first-time human occupies the land. It is done to provide food for the own consumption. While this culture is vanishing in another region, the Gozitan still keep it until this present time. In the past, the production and consumption of the kitchen garden in Gozo were for personal. The location, the accessibility, and the boundary of the space emphasized the privacy. At that time, the garden was located next to the house or on the back side of the house which provided no access for the public. High stone wall with no opening was used as the boundary to prevent public saw the activities in the garden which mainly done by the women. The assumption raises that this way of garden consumption is influenced by Arab colonization in Gozo because that way of consumption is quite similar to the existence of the inner courtyard in the traditional Arab house.

Nowadays, Gozitan offers another way of consuming the garden. Besides consuming privately, the inhabitant starts using the kitchen garden collectively. Some groups utilize the shared garden which emphasizes it as a semi-public space. This new way of consumption allows the inhabitant to improve the social life through communication, discussion, or working together in the kitchen garden. This situation will strengthen the social bond in the society. However, the transformation of the personal garden into sharing space will decrease the value of privacy. Bearing in mind that semi-public garden means there is no private boundary; the user of the garden consumes everything within the shared space together. This fact shows that concerning semi-public garden, the quality of space decreases in term of privacy. For the physical characteristic, the current garden still has the same quality with the past time garden. The garden still located around the house with the limestone wall as the boundary. However, some of the gardens nowadays take place in the front of the house which strengthens the idea of space negotiation. It shows that the inhabitants still maintain the existence of kitchen garden although the location differs from the past time. The height of the wall is varied and depends on the owner of the space. The Gozitan cultivates the garden by growing some vegetables and fruit trees as well as some chickens, rabbits and a few goats and sheep. The most common plant that is grown in kitchen gardens is potatoes, followed by onions, beans, and grape [6]. In the rural area, planting vegetables and some fruit trees allows the Gozitan to have an own supply of food. In another word, the existence of kitchen garden on Gozo fulfills the need of household for food.

The gardening activity succeeds producing more productive space instead of abandoning the land. This notion gives the benefit not only for humans, but the environment also. Gardening is also one way to bring nature into daily life. In a day, people spend some of the time, cultivate the land as part of the life. The idea of farming means that people have thought the responsible way in consuming the nature. It has shown that garden as space has rooted in Gozitan daily life and the garden is a culturally based production of space. Establishing in the early time of the civilization, garden in Gozo still contributes to the life of people in Gozo. Culture, in the shape of kitchen garden, has proved that it can survive through space negotiation. It also gives many advantages to the environment, economy, and social aspect as the pillar of sustainability concept.

From the environmental perspective, there is no doubt that the kitchen garden is one way to bring nature into daily life which improves the quality of life. Kitchen garden contributes positive effects concerning the environment. The root of the plant saves the underground water and protects the soil from erosion. Furthermore, the garden provides a home for another small organism such as insects, birds, etc. Garden also acts as small forest or artificial ecosystem for animal where several kinds of the animal can live and feed themselves. Moreover, the plants in the garden absorb carbon dioxide from the air for photosynthesis and therefore reduce the air pollution. From the same process, it also produces oxygen, which generates fresh air. It creates a better micro climate around the garden itself. Kitchen garden on Gozo Island also covers all the lack of greenery in public side. The explanation shows that the contribution of kitchen garden means a lot for the island itself.

The existence of kitchen garden also contributes positive value for the economy aspect. It increases the income of the inhabitant. The owner uses the product from the kitchen garden as kitchen supply. This idea saves the money since the inhabitants do not have to purchase some foods in the market. The surplus of the product can also be sold which later increases the family's income. The value of the land also increases as it becomes a productive space. Therefore, the existence of garden gives advantages for

the economic pillar. Moreover, social aspect also benefits from the presence of a shared garden. It consolidates social cohesion which already occurs in society. It also strengthens social behavior towards others such as respect and sharing sense. The shared garden allows the labor works together, help each other, shares responsibility and ideas. It teaches the user to share, not only for the management of the work itself but the product also. In the other word, the shared garden acts as a social space where the society can socialize each other and transfer knowledge. Amongst other fancy space, the shared kitchen garden can be one choice to maintain social cohesion.

The explanation above has shown that as the cultural based production of space, the kitchen garden has sustainable value. It gives advantages to the environment, economy and social aspect. It also contributes to the culture itself as the culture is preserved by produced continuously. Hence, it can be considered as one basis to implement the concept of sustainability. Moreover, in this study, the culture has a position and value as the foundation of sustainable development. The basis is promising because this activity is a daily life based, contextual, and well adapted to the surroundings.

### 3.2. Banda Aceh, Indonesia

Banda Aceh locates on the Sumatra Island and the western city of Indonesia. As part of Indonesia, it has diversity and uniqueness. The variety includes cultural richness such are language, traditional dance, traditional song, and architecture. On its time, Banda Aceh held a vital position as a port city. That situation allowed the traders from other country came and spread their own culture. It is one of the reasons for the diversity that Banda Aceh has. The ethnics who live in Banda Aceh also influence the diversity. However, the Muslim citizen is another characteristic of Banda Aceh. The majority of the population is Muslim. This condition affects the culture of Aceh, which mainly related to the Islamic values. In terms of architecture, the traditional house is one of cultural creation. All traditional houses are produced to accommodate human activities including cultural interest. In fact, the ancestor inherits the local knowledge about the house itself in the society from generation to generation. The interesting thing is the traditional house is well known for its high adaptation to the climate and the geography; wherever people build the traditional house, its ability to adjust is always proven [7]. For that reason, it has achieved the living comfort standard from the ecological side [8]. Some people argue that traditional house is a sustainable product which needs to be preserved, enhanced and developed further so that it can be an answer towards the issue of sustainability.

Since Aceh has many tribes, various kinds of traditional houses have risen. However, in general, it has the same component. The main elements of the Aceh traditional house are the front porch, the back porch, and the lady's house which located in the middle of the building; some houses have the additional elements such as the kitchen [9]. As many other Indonesia traditional house, it is a lifting house. The inhabitant builds the house above the ground level. It creates space underneath the building around 2,5 – 3 meters high. This area is as wide as the house above. This kind of structure is a solution to flooding which occurs in the past. In the case of it, the flood will flow under the house. It also prevents the inhabitant from animal attacks. For the information, in the past time, the Aceh traditional house is surrounded by the forest. Therefore, sometimes animal attacks the village. The elevation of the house prevents the animal from injuring the citizen.

Another benefit of this lifting house is the smooth air circulation. The floor material is bamboo slats which have a small gap in between. The gap allows the air to flow from under the house into the building. This condition creates comfortable interior space which leads to the energy efficiency. The smooth air circulation also creates a healthy building which gives the advantages to the inhabitant of the house. Moreover, many activities take place in this underneath space. In the past time, people often socialized in this area. The women also did their job such as weaving or looking after the children. Sometimes, the informal meeting also happens in this underneath space. Nowadays, some of the activities are still done by the citizen. In a certain place, the area is used to hold "*Maulid*" event when the day is rainy. All underneath space owned by the citizen are used together to organize the event. It shows that the society consumes it as a multifunction area. This way of consumption is very effective and efficient. Space is used maximally and can save the land.

Furthermore, the construction of the Aceh traditional house is known as the building without nails. All the connection does not use any nail; it uses the wedge. That allows the building to adjust in case the earthquake happens. 2004 earthquake has shown that Aceh traditional house is resistant toward earthquake. Moreover, the material used in the construction is the green material [10]. It is the renewable raw materials and has better durability so that reduces the replacement cost [11]. It is also available in the neighborhood which reduces the transportation cost and carbon footprint. The use of nearby material also increases the income of families around the site and improves the economy aspect of the inhabitant. The material is also a non-toxic material. It keeps the health of the householder and at the end increase the quality of life of the house owner.

Although it has many advantages, the Aceh traditional house is starting vanishing because of many reasons. One of them is the material issue. The price of the wood as the building material is quite high which makes people turn away from the Aceh traditional house. Moreover, the physic of the house itself is believed to be incompatible with the changing needs. However, this cultural based production mode is sustainable proven. The Aceh traditional house gives the positive contribution to the economy, social, and environment aspect as the pillar of sustainability concept.

The existence of the Aceh traditional house, in fact, does not endanger the nature. The traditional house is well-known with its high well-adapted concept. Some implementations in the Aceh traditional house is the idea to lift the house which allows air circulation and allows the flooding to flow freely. Another evidence is the west-east building orientation. The shape of the Aceh traditional house is a rectangle with two sides longer than the other two. This orientation is chosen to avoid strong west wind, which happens in Aceh. In this adjustment, the building façade which faces the west side is a small size. So that, the wind load of the building is not too big. The material used in building construction is the green material such as wood, bamboo, and sago palm leaf as the roof material. The material is also non-toxic material which keeps the health of the house owner. Minimizing the waste and emission to the environment, reducing disadvantages to the human health, using renewable raw materials and eliminating the use of toxic substance are the indicators of sustainability achievement in the environment [12]. The implementation in Aceh traditional house has shown that environment does not gain destruction from the existence of the house.

The economic aspect also benefits from the existence of traditional building. The use of underneath space has shown the effectiveness and efficiency. The idea to consume it as a multifunction space has saved the space itself and reduced the construction cost. The inhabitant can optimize the saving money for other important things. Moreover, the air circulation, which flows from the area beneath the building into the interior of the house through the small gap in the bamboo slat floor creates a better room quality. Natural air has cooled the room. So that, the house owner does not need additional air conditioner which leads to the reducing of energy consumed in the building. Efficiency, improvisation, and cost reduction are some indicators of sustainability of the economic side [12]. The use and maximization of air as the natural resources are also one of sustainable architecture concepts which also gives advantage for the environment aspect.

As its closeness with nature, the quality of life of the house owner also increases. Moreover, the activities in the underneath space involve interaction amongst society. Informal discussion takes place in this multifunction area. Waving activity which is done by the housewife is also done together with the neighbor. All activities involve the interaction and communication amongst the inhabitant. It strengthens the social cohesion and leads to the better quality of life of the people. Better quality of life is one indicator of sustainability achievement of the social side [12].

The explanation regarding Aceh traditional house shows that it is a sustained cultural production and consumption mode. So that, it can be considered as a basis to implement the sustainability concept. However, the implementation itself does not have to be in the form of "Aceh traditional house." Since it is not compatible with the modern need anymore, it can focus on the values attached to the Aceh traditional house. It can be applied to any other building as long as it does not minimize the standards itself. This way, local knowledge as part of culture can be preserved all the time. In this study, the culture acts as the foundation to create the sustainable development. By using it as the basis of implementation,

it gives advantages to the culture itself and three other aspects. This notion of implementation can be developed further as it faces “the modern need” issue.

#### 4. Conclusions

Taking everything into consideration, kitchen garden in Gozo, Maltese Islands and Aceh traditional house in Banda Aceh, Indonesia is the sustainable cultural production and consumption mode. It has been transferred from one to another generation and still exists in this present time, although in the case of the Aceh traditional house the number is smaller. The sustainability values are proven. Thus, in selected area, related to the implementation of sustainability concept, those two can be used as a foundation.

Both case studies show that the culture has the position as the basis for creating sustainable development because it is a holistic way of life that considers all aspects including the environment, social, economy and the culture itself. It is one solution to the issues in the surrounding. It teaches people to respect the nature, to improve the quality of social life, to live independent economically and to preserve the local knowledge. The culture itself is well-adapted to the nature and adjustable with the surrounding. There is no doubt that, it can be used as the foundation to implement the concept of sustainability.

Further research should be done in another region, to find a proper basis to implement the sustainability concept. The investigation should focus on local knowledge and daily basis to get solid root. As the scope of this research is the production and consumption of space, the further research should narrow it down to the architectural production. That way, the result of study will have a stronger bond with the subject of architecture. Furthermore, the next investigation should also observe how the perspective of the society is regarding the culture itself. “Can it be a foundation for the sustainable development?” “Should it be modified to fit to the current need?” The answers will help the implementation itself as the inhabitant is the implementer of it.

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