The Adaptation of Local Wisdom as a Solution to Environmental Conservation in Small Islands

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Abstract. As a collection of knowledge, experience, and entrenched human actions, local wisdom is widely believed capable of conserving the environment and its natural resources. However, in other sides, problems related to the wealth and community development where local wisdom has been practiced are not well addressed yet. Similar situation exists in the small islands with their all development restrictions such as low accessibility, lack of infrastructure, local habits that sometimes are not in line with development activities and national strategy which integrates and harmoniously accommodates the development of a cluster of small islands that remains unclear. In environmental management, local communities should deal with socio-ecological issues such as lack of participation, poverty, food security, climate change, water conservation et cetera. In other hand, environmental changes have limited the ability of communities to use and preserve the environment. Therefore, the ability of local communities in environmental conservation of small islands remains questioned. This will have implications to the environmental preservation. Furthermore, local communities should adapt their local wisdom to respond the environmental changes by integrating the wisdom into their life system. It is expected that by doing this, local communities have a chance to better off while in the same time can conserve the environment and natural resources. In the context of development, local wisdom should be adaptive in conserving the environment without ignoring cultural values embedded within the communities.

Keywords: Local Wisdom Adaptation, Environmental Conservation, Small Islands.

BACKGROUND

A Study on environmental changes and ability to adapt require a special attention even though local practices in environmental management imply optimism and provide justification to environmental conservation and natural resource management. The study aims to know the extent of community’s ability in managing the resources because it will affect the wealth of community and stability of ecosystems in future. In this context, a study on the ability of local community within typical geographic area to manage their resource, to respond the changes and to cope with environmental pressures becomes very relevant.

The study on environmental management is not only conducted in mainland but also in areas where land is limited such as in small islands. It is believed that environmental conservation, including forest resource, by local community is widely practiced throughout the archipelago (Suharjito et al., 2000). However, attention to small islands is only targeting marine and coastal management (Dahuri et al. 2001; Satria et al. 2002), leaving only a small piece to local wisdom in environmental conservation. This paper will discuss forest conservation in small islands that is in line with cultural response of the people to environmental changes. Small islands’ community has ability to adapt by utilizing limited environmental condition. In small islands, this adaptation relates to the way of community in using two resources namely farming (Fox 1996) and fishing (Satria et al. 2002; Manan dan Arafah 1999).

Small islands receive attention due to their typical characteristics of physics, ecologies, economics and socio-culture (DKP 2007; Dahuri et al. 2001). According to DKP (2007) and DKP (2004), small islands generally have a number of problems such as less accessible, lack of infrastructures, local custom that is usually not supporting development activities, sporadic development and absence of national strategy to harmoniously and integrally develop clusters of islands and poverty. In Wangi-Wangi for instance, the inhabitants encounter limited resources...
of land, fresh water and high population pressure. All these have jeopardized the existence of forest and water resources (Arafah, 2009).

This paper aims to describe the importance of adjusting the local wisdom with the changes by keeping the local values and by supporting the sustainable wealth of community.

Environmental Changes, Adaptation and Conservation

A study on environmental changes such as demography, economics and politics intends to understand social transformation in community’s life. Alfian (1986:77) in Akhmad (2005:13) describes the transformation as cultural transformation because it relates with value changes which in turn delivers behavioral and attitude changes. It is explained that in one hand, socio-cultural transformation means socio-cultural reform while on the other hand, it means as values reform. There are four stages of transformation process. First, infiltration of external culture changes values’ order such as global communication process. Second, creativity of internal actors is marked by new invention. Third, pressures from the outside are seen from migration process, new technology and trade. Fourth, there are changes from inside such as technology innovation which not only provide easiness of life, but also force a new practice of life that appropriate to generated technology.

Related to changes in environmental aspect, human beings will try to adapt with. Helmi and Ancok (1996) explain that human behavior will be influenced by how far a change happens then it tries to adapt itself with the change by doing or creating social condition and having social interaction such as competitive and cooperative as well. Environmental changes cannot be separated with the interest of human beings to live where depending on their existence to the environment. It means that to keep balancing the life, environmental changes are dialectical influence with civilizations. Changes in civilizations are also influenced by three factors, namely: dependency level to nature, market (economics) and used technology. The less dependency level of human to nature, the more traditional behavior will gradually shift in accordance with time development. Similarly with market orientation shifting trade-offs with money. Politically, changes as a result of community dynamics may change solidarity into conflict. Dynamics in relation among ethnics, cultures and religions will leave problematic traces that are very influencing to the nation integrity for example tensions and conflicts among the dwellers (Alfian, 2013).

People do change in order to survive personally and communally. Adaptation is a process where human beings maintain their life. Adaptation process through changes will be easy if they accommodate or ensure communities’ life (Dyah, 1999), and if they conserve the environment and its natural resource as well (Aryadi, 2012). If adaptation process due to changes is associated with time course, then values influencing the changes would automatically change in accordance with demand and readiness of community to undergo the changes. This happens because time and changes are always hand in hand. Moreover stabilization concept as a form of adjustment represents a convention (Sztompka, 2004). It is explained that stability will only have a meaning if refers to something else namely community, environment and membership of other changing groups.

The aims of conservation are long term utilization and preservation. In environmental conservation aspect, Downs (2000) argues that the success of community in maintaining social sustainability and environment is shown to the readiness, social interaction, technology and ethical values that are in line with ecological reality. Population pressure, technology and economics represent inseparable things from human’s life so that in order to get around the things, culture is required. It is also described that the purpose of environmental conservation are (1) ensuring preservation of environmental quality that regards aesthetics and the needs of recreation and its results; and (2) ensuring sustainability of useful results by creating balanced cycles.

Wangi-Wangi Island

This paper explains local wisdom adaptation of community of Wangi-Wangi in environmental conservation that relates to utilization of natural resources. This conceptual relation refers to a synthetic result of community response observed in social organization, technology, arrangement of family labor and development of livelihood (Steward 1955; Geertz 1983; Fox 1996; Kuntowijoyo 2002). The importance to observe the relation between the environment and culture in the context of resource management is supported by Werner (1941) and then cited by Utomo (1975) who claimed three fields of communities’ life namely social organization, the technical and the religious systems.
As a capital of Wakatobi, Wangi-Wangi Island represents a small island and even more small\(^1\). In 2003, Wakatobi became autonomy regency after administratively separated from its main island, Regency of Buton. Wakatobi is situated in the area of National Park of Wakatobi with 13.533 km\(^2\) width, similar to the width of marine area of the regency.

Wakatobi in numbers (2013) recorded that Wangi-Wangi island had 48.000 inhabitants with population density reached 320 inhabitants per kilometer square\(^2\). The total area of Wangi-Wangi is 448 km\(^2\), of which are distributed to Wangi-Wangi sub-district (241.98 km\(^2\)) and to South Wangi-Wangi (206.02 km\(^2\)). This island represents the biggest occupied island in Wakatobi. The people of Wakatobi make a living mainly from farming and also doing trading, sailing and fishing as well.

Like other small islands in Southeast Sulawesi, the island has high temperature (type D). Wind direction consists of two seasons namely West (Waha) and East seasons (Timu). West season happens on December to May where the wind blows from the land of Asia to the equator line through pacific oceans which contains water vapor and sometimes accompanied by the storm. In contrary, east season happens on June to November where wind blows from the east with high wave throughout the season. Wangi-Wangi Island is arid and poor in land resource. There are reeds (Padangkuku) in the East, North and South of the island. Fertile land is found in the west and in the middle of island where forests exist. Out of total area, only 8.2% that can be used to plant cash crops throughout a year.

In general, land use in Wangi-Wangi is not based on administrative system but on customary rules. Swidden becomes prominent land use in this island. The farmers plant cassava, corns, nuts, sea cucumbers, some fruits et cetera. For construction, the dwellers plant teakwood, red wood, stone wood and the like. They also raise livestock such as goats, ducks and domestic chicken. Moreover, there are 12 plantation species that they plant namely palm, tamarind, cloves, cashew nuts, cocoa, kapok, coconuts, hybrid coconuts, hazelnut, coffee, pepper and nutmeg (Wakatobi Dalam Angka, 2013). In the beginning, the citizens hunted fish, looked sea shells and by now they do fish and seaweed culture and sell their derivative products.

### Local Wisdom of Community in Wangi-Wangi Island

Since the beginning of civilization, communities in the island have allocated land function from the mountains to the sea reflected from customary governmental structure. This appeared from the names of officials in the structure which reflected the area function such as Kaindea (protected), Motika (woods and conversion) and Padangkuku (reeds as farming reserve area). Furthermore, farming areas have been also established such as Koranga (garden), Padha Nto’oge (the reeds), Ontoala (fields), Motokau (garden which is forested temporarily) and the like. In the coast, there are local wisdom such as Kolo (bay), Rompo (fishing gears made from bamboo), Sava (fishing grounds at the reefs), Tondo’a (a specific area fenced by stones to catch particular fish) (Manan and Arafah, 1999).

The existence of local community wisdom is inseparable from the efforts of community in adjusting their social institution, farming technology, and arranging their family labor and development of income sources.

### Local Wisdom Adaptation

Adaptation aims to ensure sustainable uses of natural resources. Downs (2000) argues that the success of communities in maintaining social and environmental sustainability is demonstrated by readiness, social interaction, technology and ethical values which are in line with ecological reality. Population pressure, technology and economy cannot be removed from human’s life so that culture as the way of human live is required to get around. In this context, local wisdom adaptation as a solution on environmental conservation practiced by the peoples of Wangi-Wangi is adjustment to social institution, technology system, arrangement of family labor and development of livelihood.

1. Adjustment of Social Institution

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\(^1\) Definition of small islands is an island with an area less than 2,000 km\(^2\) or same. The similar definition is also used by UNESCO (DKP 2007:8-9; DKP 2004:7).

\(^2\) According to Beukering, population pressure is measured from farming activities namely land ability to accommodate farming activities or the ratio between population number and land width. It is explained that in Indonesia maximum ratio for farming activities is 50 people/km\(^2\). If it is exceeded, there will be ecological deterioration (Fox 1996:33-34).
In 1960 customary government was disbanded and was switched to district system by the central government. During the transitional era from 1960 to 1970, the government control was in the form of district. The inhabitants in Mandati have responded the changes of customary institution by strengthening Sara religion centered at the mosque (Sara Mesjid) for religious affairs and empowering the big family (Santuha) as customary holders for managing customary affairs and the uses of natural resource. Meanwhile, the role of Meantu‘u was taken by the village head as facilitator. The roles of Meantu‘u at village level were handed to local Sara at mosque together with head of sub-village.

In forest resource management, coordination between the village head (government) and customary holders (Santuha) lead by Sara Mesjid at Mandati mosque has determined the effective uses of the resources. The effectiveness of such institution has been practiced and recognized until today. As a proof, completion of community and government affairs and resource controls are well manageable. Moreover, a number of social and environmental problems are more effectively solved if compared with the involvement of police officers or the head of district (Camat). In this context, the role of Santuha as representative of customary affairs is very important in enforcing the values within the community including environmental management as well.

2. Adjustment of Technology System

Marine, farming land and forest represent cultural identity which cannot be separated from the life of community (Dahuri et al., 2001; Suharjito et al. 2000; Awang 2004). This also applies to Kaindea (forest), Koranga (farming land) and Mawi (marine) in community of Wangi-Wangi. Farming area and marine represent main source of staple food for family, while forest serves as fertility and water sources (Pamonini‘a u’togo). Forest, marine and farming areas also represent economic activities and confirmation of social system in community. To fulfill economic needs, the inhabitants grow some cash crops such as cassava, corns and some vegetables. There are also plants interlude such as coffee and coconuts. Furthermore, marine is recognized as sources of animal protein and inter island traffics of trading.

3. Arrangement of Family Labor

Women were originally staying at home, taking care of the family while men would be responsible for economic needs including agricultural business. At that time, agricultural system was still subsistence. Apart of the yields of agriculture were brought home and the rest were sold at traditional markets. The wives would help their husbands in farming land. This situation was changed because increased numbers of family members, limited farming areas and increased other needs. Some of them began to sail, to trade and to wander both to inter islands and to overseas.

Economic changes that brought effects to arrangement of family labor have resulted changes in roles and activities of family members including women in families’ economy. Central market and some traditional ones in Wangi-Wangi are dominated by women. Even though men have responsibilities to feed the family, but after economic changes, women have also participated for their family living. This role is not replacing the ultimate role of a wife and a mother at home. Meanwhile, teens are not only going to school but also helping their parents to clean and maintain the farming land. They work together at the land of one of their relatives and after that they do the work in other relatives’ land.

4. Development of Various Livelihoods

Various livelihoods represent income sources from non agricultural sector that become a means of livelihoods such as migrating, sailing and trading. Migration is defined as movement of community members to out of their village for sailing, trading and looking for other jobs. Limited migrations happen long before independency. In addition to have negative impacts, migration and trading have also caused positive impacts. Limited migration could reduce pressure to the environment because some of dwellers change their income sources. However, it changes behavior of the rest jeopardizing local wisdom in natural resource management. Increasing demand by population pressure and economic development is responded by migration. Migration is the way of people to encounter the pressures and avoid poverty such as what have been practiced by Maduranese in coping with the limited ecology condition (Kuntowijoyo 2002).
Conclusion and Implication

Communities have responded the environmental changes by building adaptation strategies in the form of adjustment of social institution and farming technology, arrangement of family labor and development of various livelihoods. Adjustment of social institution has been conducted through customary institution’s adjustment and strengthening kinship relation (Santuha) that control social system and natural resource management. The appointment of village head must be agreed by customary holders or community. Kinship relation (Santuha) from blood ties is extended to relation in service/dedication. Furthermore, adjustment of farming technology namely land intensification through the use of fertile land around the forest, land management, arrangement of planting distance, and adoption of technology, aquaculture and seaweed. Meanwhile arrangement of family labor has included all family members in economic activities of families. Lastly, development of various livelihoods has been practiced by migrating, sailing and trading and being civil servants.

Local wisdom adaptation of community in Wangi-Wangi Island could conserve customary forest of Kaindea for more than 350 years and could also preserve farming land and marine resources (Arafah, 2009; Manan dan Arafah, 1999). With its great environmental vision, Wakatobi becomes the world destination of ecological tourism. It was also awarded World Biosphere Reserve for its environmental conservation efforts (Bappeda Wakatobi, 2013).

Policy Implication

In Wangi-Wangi, community has responded the environmental changes through two main strategies, namely internal and external. Internally, they have strengthened the social institution and have adjusted their farming technology. Externally, the dwellers have arranged the family labor and have developed various livelihoods. External adaptation strategy focused to work outside of the village has become a good indication that the community has social carrying capacity to adapt with limited ecological condition.

Policy strategies that are suitable to be applied in Wangi-Wangi and in other small islands are community capacity building, the use of handy technologies and development of various non agricultural livelihoods such as the use of marine for fisheries, environmental services and trading. To ensure the revitalization of local wisdom, it should be formally institutionalized in a local decree.

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