Community Involvement in Forest Resource Utilization: Case Study of Rural Communities in Japan and Indonesia

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Abstract: Forest resource utilization has been extensively promoted in recent years to encourage forest resource conservation and socioeconomic development. However, the degree of involvement of local people in forest resource utilization varies between communities and between countries, depending on social and policy conditions. To address these concerns, this study compares the involvement of local people in forest utilization in two different communities; Komono, Japan and Desa Taman Jaya, Indonesia. The study explored the involvement of local people in forest resource utilization by analyzing data on benefits accrued from forests, local values, and forest management through the lens of local people. Data for this study was collected by interviewing targeted members of the communities and by sending questionnaires to randomly selected members in both communities. The study affirmed that there are differences in the levels of community involvement in forest utilization in the two communities. Limited access to forest resources and low educational levels are the cause of heavy dependence on forest resources in Desa Taman Jaya. The reverse is true in Komono, where local people are less dependent on forest resources. One take away from this study is that policy makers can increase local involvement in forest resource utilization by promoting the use of non-timber forest products and ecotourism. Another take away from this study is to consider the concerns of local people through the lens of background knowledge such as age, gender, and education levels, when designing programs to encourage local involvement in forest utilization.

Keywords: community participation, ecotourism, forest management, national parks, poverty

1. Introduction

For thousands of years, forests and local communities have enjoyed a symbiotic relationship. In this relationship, forest plays an important role in enhancing livelihood requirements for local communities and in maintaining ecological balance. Local communities enjoy ecological services, food, and forest products from the forests. Forests on the other hand are impacted by activities undertaken by local communities. Examples of such activities include: slash burning, transformation of forestlands into farmlands, plantation forestry and other changes that affect ecological processes in forests (Newton 2007). In this symbiotic relationship, local people or communities can also play an important role in the conservation of forestlands. In some localities, knowledge gained from local or indigenous people play a critical role in forests conservation efforts as well as the wise use of forest resources. Also, effective forest management is enhanced through such practices as the protection of culturally modified trees and building a special relationship between local communities and the surrounding forests (Brown and Lassoie 2010).

Although local communities do derive a great deal of benefit from forests, this benefit stream is not sustainable if there is no optimum utilization and management of the forest resources. This is the problem in most areas in Japan and Indonesia, since the needs of local communities are not integrated into forest management.

In Japan, domestic forestry is facing major crisis because of shortages in forestry labourers and the continuous decline of log prices (Matsumura et al. 2013). Most forests in Japan are privately owned and landowners are solely responsible for carrying out forest management activities. To comprehend the full situation of the crises in Japan, we will like to take you through a flashback of the history of forestry in Japan. It can be said that forests was over exploited during the early years of 600-850, due to high demand for timber in the construction of houses, palaces, monuments, and other buildings (Marten 2005). To meet the high demand for timber production, there was a push for reforestation by landowners. As a result of this push, most plantation forests reached maturity for harvest around the period following World War II (Matsumura et al. 2013). However, because of high management cost most landowners have failed to supply enough timber from their forests plantations to meet the high demand. Another contributing factor to the local timber supply...
problem is the fact that there is a rise in timber imports from other countries with lower timber production costs. This has led to depressed timber prices. This downward pressure on timber prices is having a negative impact on the profit margins for most landowners, as they are unable to compete with cheaper timber from other countries (Matsumura et al. 2013). These difficulties or crises have left most plantation forests, unmanaged or without proper care at a time when the general public has a growing realization of environmental values or benefits from forests. These benefits include, but not limited to erosion prevention, clean water supply, preservation of biodiversity etc., and the interest in these environmental values continues to increase year after year (Iwamoto 2002).

Unlike Japan, most forest areas in Indonesia are owned by the government and the utilization of natural resources is controlled by a central government. Forest plantations are managed by a state-owned company called Perum Perhutani. As a result of government ownership of forests, local communities have limited access to forest resources. The limitations placed on subsistence-dependent communities to forest resources have led to an increase in the poverty rate. Again, to comprehend the full situation of the problem caused by government ownership in Indonesia, we will take you through a flashback of the history of forestry in Indonesia. Under Indonesia Basic Forestry Law of 1967, access rights to forest resources use is based on customary law. This law limits the utilization of all forests resources inside Indonesian territory. All natural resources are controlled by the state. In 1999, the basic forestry law of 1967 was reformed (Forest Law 1999), granting utilizing of forest resources according to traditional areas, which are based on customary laws. The sole existence of a traditional area is determined by the local government (Siregar et al. 2007). Despite these reforms, there are still border disputes between local communities and forest areas controlled by the state (Kusumanto and Sirait 2002). To minimize conflicts between governments and local communities, it is prudent to involve local communities in the decision making process in forest conservation areas.

From the aforementioned problems outlined in the previous paragraphs, it can be concluded that local communities or people in both countries no longer enjoy much economic benefit from the forests. It can also be said that apathy or none involvement of local community members in forest management decision making is the cause of abandonment or over exploitation of forest resources. This study aims to educate readers to understand the challenges of evaluating forest resource utilization, management and conservation in diverse communities. This study has both local and global relevance because results from this study can help policy makers and governments around the world to come up with suitable policies to encourage local involvement in forest utilization which can alleviate poverty and benefit rural communities all over the world. This research is unique in the sense that it employs a quantitative approach to evaluate how the promotion of local values and public participation in forest management can impact forest conservation activities. This research therefore contributes to literature by increasing our understanding of how rural communities or local people can be encouraged to partake in forest management and conservation activities.

In this paper the term local people and local community members are interchangeable. Local or rural communities as used in this paper refer to local people who live around forests and participate in forest utilization, management, and conservation activities. Two research locations were chosen for this study: Komono in Japan and Desa Taman Jaya in Indonesia. To compare local involvement in forest utilization in the both communities, we evaluated the benefits derived from forests in the two communities by considering local values in the two communities; and we took into account the perspective of local people on forest management through the lens of government control, non-profit organization (NPO) participation, and local community control. Data gathering was conducted by interviews and questionnaires.

The results of our study reveal several interesting findings. This study brings to light the significant difference in benefits derived from forests in Desa Taman Jaya and Komono Town. In Desa Taman Jaya, the direct benefit gained by local people was significant. Local communities rely heavily on forest products. Limitations placed on access to forests in local communities are seen as a major obstacle to the development of local communities. In Komono, local people no longer derive direct benefits from forest areas. Local people in Komono undertake conservation activities by deriving more satisfaction from non-timber forest products. The study also reveals how the background of local people influence their attitude towards the benefits derived from forests, local values, and forest management. Variability in the background of local people, e.g., age, gender and educational levels was more pronounced in Desa Taman Jaya compared to Komono. Finally, the study concludes that policy makers and decision makers in government should consider encouraging...
more local involvement in forest utilization by promoting the use of non-timber forest products and ecotourism.

2. Methodology

2.1. Research area

Two research localities were considered for this study. The first is located in Komono, a town in northern Mie Prefecture, which covers an area of approximately 107.28 km². The location of Komono in Mie Prefecture is shown in Figure 1. Komono is populated with 13,568 households, 39,978 residents; of which 19,424 are men and 20,554 are women. Of the total land area of Komono, 5,371 ha or 52% of the land area is forested. The forested area is made up of 1,605 ha of manmade forest and 3,488 ha of natural forest. In terms of forest ownership, 5,220 ha or 97% is privately owned. The privately-owned forest is further divided into 3,442.83 ha of private forests and 1,777.7 ha of forests owned by former ruling families.

Figure 1. Location of Komono on the map of Japan (up) and an enlarged map of Komono in Mie Prefecture (down) (Mie Prefecture 2011).

Forestry was once the economic engine of Komono. Like many areas in Japan, property rights for private ownership of forests in Komono are derived from previous generations, known as “land lords”. Forests are used for both timber production and non-timber forest products, and to sustain timber production, forest landowners plant Japanese plantation species like: *hinoki* (Japanese cedar), *sugi* (Japanese Cypress), *Matsu* (pine – Japanese), and other plantation species. For non-timber products, landowners collect such products like sansai (wild vegetables – Japanese), taro, onions, strawberry, etc. (MoAFF Japan 2015).

In recent times, forestry is no longer the economic power it used to be in Komono. Among all residents, only 968 people (or 2.4%) are farmers or in forestry. Of this figure, 40.59% are subsistence farmers and 59.40% are also sellers (MoAFF Japan 2015). Besides working on the farm or forestry in Komono, people in Komono predominantly work in factories in neighboring towns and cities such as Yokkaichi, Kuwana and Nagoya. These days because of the low economic activities in Komono, it often referred as a sleeping village (Hirose et al. 2016).
The second study area considered in this study is located in Desa Taman Jaya, a village in Kecamatan Sumur, province of Banten, Indonesia. The location of Desa Taman Jaya in Java Island is presented in Figure 2. The village is approximately 675 ha in size and is populated by 741 households or 2,846 residents, of which 1,441 are men and 1,405 are women (BPS Pandeglang 2015). Desa Taman Jaya is a typical representation of a rural area in Indonesia which is characterized by high population growth, low economic income, low level of education and poor infrastructure. The average income in these communities is about IDR 600,000.00 (about 45 USD) per month, considerably lower than the monthly minimum wage in Banten Province, which is about IDR 1,050,000 per month (BPS Pandeglang 2014).

Figure 2. Location of Desa Taman Jaya in Ujung Kulon National Park (Balai Taman Nasional Ujung Kulon, 2010)

Desa Taman Jaya is one of the buffer zones of Ujung Kulon National Park (UKNP). Local people are allowed to carry out forestry activities within the traditional zones of UKNP. Traditional zones in UKPN are parts of the national park where benefits of traditional use by the local community members are encouraged, based on evidence of historical dependence on natural resources. There is evidence that in the past; forest management was practiced in the forested landscape of UKNP before the area was designated as a national park. Historical activities of the local people who live near this forested landscape are taken into account before the government allows access to these traditional forest zones for the extraction of forest resources. In the traditional zone, they are allowed to collect fuelwood, vegetable, and medicinal plants. They are also allowed to cultivate and grow food crops.

Both research locations are rural areas bordered by national parks. While Desa Taman Jaya is bordered to UKNP, Komono Town is located in the buffer zone of Suzuka Quasi National Park (SQNP). National park is an important area of the countryside, protected by government for the enjoyment of the general public, or the preservation of wildlife. In other words, it is a kind of conservation area designed by government for natural protection, tourism, and environmental education. These two locations were determined by considering their closeness to forests and national parks, where the conservation efforts are being conducted.
### 2.2. Data collection

In this study, primary data were collected to support both qualitative and quantitative research methods. For the qualitative method, the primary data was collected by interviewing predefined or targeted members of the rural communities. In the case of the quantitative method, the primary data was obtained by distributing questionnaires to randomly selected members of the rural communities in both research areas. Secondary data was obtained from journals, books, reports, and documents from government, Bureau of Statistics, libraries, and Non-Governmental Organization (NGO) or Non-Profit Organization (NPO).

Data collection was conducted in Desa Taman Jaya from November to December 2014. In Desa Taman Jaya, interviews were conducted on 12 people: 4 municipal officers and employees of Balai Taman Nasional Ujung Kulon in Desa Taman Jaya and Labuan District, 2 staff members of WWF Ujung Kulon, 1 owner of a hotel in Desa Taman Jaya, 3 local residents employed as guards of TNUK, 1 craftsman, and 1 tour guide. In Komono, data collection was conducted from September to December 2015. Interviews were conducted on 8 people: 1 municipality officer in the tourism department, 1 staff member of NPO also referred to as Mori No Kaze, 2 public relations managers of hotels, 1 campsite owner, 2 managers of Forest Company, and 1 local farmer who spent most of his life in Komono. The sample size of interviewees in Komono and Desa Taman Jaya is shown in Table 1. Besides interviews, we collected questionnaire data from local community members in Komono and Desa Taman Jaya; 61 people from Komono and 92 people from Desa Taman Jaya. Number of respondents in Komono and Desa Taman Jaya are presented in Table 2.

Table 1. Number of interviewees by institution in Komono and Desa Taman Jaya.

| No | Represented institutions                           | Komono | Desa Taman Jaya |
|----|---------------------------------------------------|--------|-----------------|
| 1  | Government officials or staffs                    | 1      | 4               |
| 2  | NGO / NPO officials and staffs                    | 2      | 2               |
| 3  | Tourism investor (hotel owners)                   | 2      | 1               |
| 4  | Local people who are active in conservation activities | 1     | 3               |
| 5  | Craftsmen                                         | 1      | 1               |
| 6  | Local people who are active in tourism activities | 1      | 1               |
|    | Total                                             | 8      | 12              |

Table 2. Number of respondents in Komono and Desa Taman Jaya by gender and age.

|                   | <20 yr. | 20-40 yr. | 41-60 yr. | 61-80 yr. | 81-90 yr. | Not Mentioned | Total |
|-------------------|---------|-----------|-----------|-----------|-----------|---------------|-------|
| Komono Male       | 0       | 7         | 6         | 18        | 1         | 3             | 35    |
| Female            | 0       | 2         | 11        | 8         | 0         | 5             | 26    |
| Total             | 0       | 9         | 17        | 26        | 1         | 8             | 61    |
| Desa Taman Jaya   | 3       | 49        | 23        | 0         | 0         | 0             | 75    |
| Male              | 0       | 15        | 2         | 0         | 0         | 0             | 17    |
| Total             | 3       | 64        | 25        | 0         | 0         | 0             | 92    |

### 2.3. Research design

This study combines the use of both qualitative and quantitative methods (mixed method); through a “less dominant-dominant sequence” (Creswell, 1994). Qualitative method is used as the principal approach or the dominant approach in analyzing the differences in the roles played by rural communities in forest conservation for both Komono and Desa Taman Jaya. The analysis was done by evaluating data on the activities of rural communities and their perception of the roles forests
plays in their communities. The quantitative approach or method was used as a less dominant method to supplement the qualitative analysis.

From literature (Kothari et al. 2013), local participation in forestry can be learned by analyzing the benefits enjoyed by local communities, the values of local communities, and the local governance in the area. In this study, we compared forest resource utilization benefits, the role played by local values, and the perspectives of local communities on collaborations between government, NGO, and local communities with respect to forest management. Descriptive results of the qualitative analysis are presented in the results and discussions section of this paper.

In the results and discussions section, we also analyzed the role a respondent’s background (i.e., age, gender, and level of education of the participating local community members) in both Desa Taman Jaya and Komono play in providing answers to the questionnaires. This study used regression models including logistic regression and proportional odds model to investigate the relationship between respondents’ backgrounds as an independent variable (i.e., age, gender and level of education) and the answers to the questionnaires, as the dependent variables. The quantitative results based on statistical analysis using regression models and cluster dendrogram are presented in the results and discussions section. For the analysis, we used R-functions (R Core Team 2013) including generalized linear models (glm), cumulative link model (clm) and hierarchical clustering (hclust). AIC (Akaike’s information criterion) was used to select the best model. The models clm and glm were used in the case of Desa Taman Jaya and Komono to analyze the regression relations. Furthermore, hclust function is used in the case of Komono, to make cluster dendrogram that shows the relationship between the answers in the questionnaire.

3. Results and Discussions

The involvement of local communities in the forest resources utilization was first analyzed through the lens of benefits accrued from forests, values held by local community members on forestry issues, and how local people view forest management in these areas. The results of the questionnaires are summarized in Table 3.

3.1. Forest benefits, local values, and forest management in Desa Taman Jaya

In Desa Taman Jaya, forests support the livelihood of local people as they depend heavily on forests for their survival. Local communities use firewood from the forest for heating and cooking, and collect fodder from forests to feed their livestock. Other benefits from forests enjoyed by local communities include minor forest products such as medicinal plants. Since forests in Desa Taman Jaya are under the ownership of the state, activities undertaken in forests must be with the consent of the local government. Timber harvesting in these areas are strictly prohibited as the forests are set aside mainly for wildlife protection and conservation. There is limited access only to minor forest products within these “benefit zones” and “traditional zones” of the national park. Although activities in these protected areas are prohibited, there are recorded instances where local community members trespass and steal woods. Illegal logging in Desa Taman Jaya is the biggest hindrance to forest conservation efforts in these areas.

In Desa Taman Jaya, tourism activities in Desa Taman Jaya is seen as an alternate source of income to most local community members. It is seen as a win-win solution for forest conservation and economic development (Butcher 2007), and is encouraged in the development of rural areas around national parks. In addition to supplementing the livelihood, tourism activities in Desa Taman Jaya also helps minimize further exploitation of forests by the local inhabitants. Local people in Desa Taman Jaya are the main benefactors of tourism activities. Tourism activities in Desa Taman Jaya are concentrated within the vicinity of Gunung Honje. The dominant tourism activity is hiking. Others tourism activities are found in the area close to the sea, bordered by Desa Taman Jaya. The influence of tourism is very profound in Desa Taman Jaya, as most local inhabitants are gainfully employed as tourism guides, drivers, and part-time cooks in hotels or inns. There are even fishermen and farmers who work on part time basis as tukang ojek (riders of motorcycles, Indonesia) - a form of taxis. They play an important role by driving tourists to and fro, from the nearest urban areas to Desa Taman Jaya. This system of transportation is used because of the under developed nature of the transportation system in Desa Taman Jaya. As a result of the significant role tourism plays in the local economy,
Table 3. Results of questionnaires about forest benefits, local values, and perspective on forest management in Komono and Desa Taman Jaya.

| Questions                          | Komono Jaya | Desa Taman Jaya | Questions                          | Komono Jaya | Desa Taman Jaya |
|-----------------------------------|-------------|-----------------|-----------------------------------|-------------|-----------------|
| Access to get firewood, fodder,  | Yes- very easy | 9% | 34% | Yes | 20% | 56% |
| and medicinal plants              | Yes - easy | 7% | 40% | No | 76% | 41% |
|                                  | Yes - neither easy or difficult | 7% | 3% | No answer | 4% | 3% |
|                                  | Yes - difficult | 4% | 1% | No answer | 4% | 3% |
|                                  | Yes - very difficult | 2% | 0% | No answer | 4% | 3% |
|                                  | No | 71% | 22% | Total | 100% | 100% |
|                                  | No answer | 0% | 0% | Total | 100% | 100% |
| Benefits from non-timber forest products | Yes - high profit | 4% | 1% | Yes - low profit | 6% | 24% |
|                                  | Yes - low profit | 2% | 24% | Yes - high profit | 7% | 2% |
|                                  | No | 94% | 74% | Yes - low profit | 2% | 43% |
|                                  | No answer | 0% | 7% | Yes - high profit | 2% | 43% |
|                                  | Total | 100% | 100% | Total | 100% | 100% |
| Benefits from selling timber     | Yes | 55% | 34% | Yes | 89% | 46% |
| products                         | No | 38% | 64% | No | 11% | 50% |
|                                  | No answer | 7% | 2% | No answer | 0% | 4% |
|                                  | Total | 100% | 100% | Total | 100% | 100% |
| Participation in traditional gathering and national park | Yes | 91% | 89% | Yes | 22% | 24% |
|                                  | No | 7% | 9% | No | 76% | 75% |
|                                  | No answer | 2% | 2% | No answer | 2% | 1% |
|                                  | Total | 100% | 100% | Total | 100% | 100% |
| Understanding about forest conservation | Yes | 44% | 71% | Yes | 22% | 24% |
|                                  | No | 51% | 27% | No | 76% | 75% |
|                                  | No answer | 5% | 2% | No answer | 2% | 1% |
|                                  | Total | 100% | 100% | Total | 100% | 100% |

it is heavily promoted by government. Beside government, ecotourism is also promoted by NGOs such as World-Wide Fund (WWF). WWF supported the establishment of Paniis Lestari Group, a local group that focuses on ecotourism and have been involved in coral transplantation in the area since 2002. Their products have been widely distributed by a company called PT. Aquamarindo, Jakarta. In 2007-2011, Paniis Lestari Group collaborated with Java Sea Charter Tour Operator to develop “Build Your Own Reef” program that allowed tourists to participate in the preservation of coral reef.

How forest resource is utilized in a community is also influenced by the values held by the local people who live in that community or their attitude towards traditional knowledge. Rural communities are generally more knowledgeable than city dwellers, foreigners or migrants, on issues related to the environment in which they live (Chambers 1983). In the olden days, it was believed that local people in Desa Taman Jaya believed that rhinos were sacred animals with supernatural powers to protect forests. They believed that rhinos were so powerful, both physically and spiritually. This feeling of reverential respect mixed with fear or wonder, helped in the efforts to protect rhinos. Most locals are also reluctant of entering the habitat of rhinos because of the fear of harming the rhinos or be killed by the rhinos. Government of the day helped to propagate this belief after it was discovered that the population of rhinos had declined and was subsequently classified as endangered species. The belief helped authorities to regulate the activities of the local communities, as well as enhance forest conservation in the area. Until recently this kind of belief was popular among the elders, who believed in supernatural powers or magic. They regularly performed special mystical ceremonies as a tribute to the rhinos. For the population of local people as a whole, pride in parks...
and wildlife supports the efforts to protect endangered species.

Several cultural events on conservation values are held in Desa Taman Jaya. These values include dances such as Tari Rengkok and Tari Panis Lisung. These dance festivals are held to celebrate the harvest of rice, a tradition of the Sudanese people, which is the dominant tribal group in Desa Taman Jaya. Unfortunately, these festivals and celebrations are becoming rare. Another influential factor on conservation activities in Desa Taman Jaya is the impact of the Muslim religion. Muslim culture is part of the fabric of this community and has had a big influence on the Sudanese culture and subsequently, a positive influence on conservation activities.

Knowledge, environmental awareness and educational background on environmental protection play a key role in the efforts to encourage forest conservation activities. Returns from the interviews, concluded that the people in Desa Taman Jaya are less educated, unaware and less knowledgeable on issues related to forest and environmental protection. It is generally believed that local people assign value to resources based on how much utility they derive from the resources or simply how many those resources contribute to their economic wellbeing. The people in Desa Taman Jaya view forests as an economic resource rather than a conservation resource. Hence, the local people in Desa Taman Jaya are less inclined to undertake conservation activities.

Efforts to undertake conservation activities were also analyzed through the lens of the involvement of local people in forest management activities in Desa Taman Jaya. Forests in Desa Taman Jaya are considered part of UKNP and are therefore zoned based on conservation function. The zonation provides traditional areas where local people are allowed a degree of utilization based on their utilization history. The core zone of UKNP is designed to protect endangered wildlife species so that any activity that encroaches into the boundary of the traditional zone is considered a threat to flora and fauna in UKNP. Based on our interview with officers of the law in UKNP, violations are frequent in Desa Taman Jaya. Local people do not interact directly with wildlife, but do so through activities such as bird trap and local husbandry which may indirectly impact wildlife population. In addition to above, there are also practices of animal husbandry by rural community dwellers in Desa Taman Jaya, such as raising buffaloes for meat. Buffaloes can roam freely in agricultural and forestry areas. Buffaloes use the same wallow as rhinos and this may allow transfer of diseases between domestic and wildlife.

Local community members do also undertake biodiversity protection in UKNP, by collaborating with government and NGOs such as WWF, under the umbrella of a program known as Program Pengelolaan Badak Terpadu (Integrated Rhinos Management Program). This program involves undertaking activities such as monitoring rhinos using capture camera, as well as performing annual rhino census (Balai Taman Nasional Ujung Kulon, 2011). Among the buffer zones of UKNP, Desa Taman Jaya was chosen to represent the main post for conservation activities in which routine monitoring activities of wildlife were carried out. Analysis of the data from WWF Ujung Kulon, revealed that at least 35 residents from Desa Taman Jaya were employed in monitoring activities at Desa Taman Jaya. Financial support for the conservation activities in Desa Taman Jaya were provided by the government (DIPA), WWF, foreign agencies such as JICA (Japan International Cooperation Agency), and partner companies of UKNP.

3.2. Forest benefits, local values, and forest management in Komono

The subsistence lifestyle as found in Desa Taman Jaya is absent in Komono. Compared to Desa Taman Jaya, Komono is an advanced society that is reliant on oil, gas, or electricity for fuel instead of the traditional firewood. That being said, there are some forest owners that enjoy the benefit of traditional use of firewood from their forest. Traditional charcoal production is a common occurrence in most forests in Komono. Since forests in Komono are privately owned, the forest owners are the main actors in forest resource utilization in Komono. They manage their forests with the sole objective of timber production. Forest owners in Komono are over burdened with high timber production costs as well as labour shortage in the forest industry. The high production costs is due to lagging technology and high machine costs, while labour shortage is the result of fewer young people interested in working in the forest industry. The younger generations are mostly interested in other jobs in bigger cities.

In addition to owners benefiting from timber production, they also derive lots of benefit from non-timber forest products such as mushrooms, medicinal plants, and decorative plants. These benefits are also harvested by other local inhabitants of Komono. Harvesting wild plants directly
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from the forests such as sansai (mountain vegetables – Japanese) are actively promoted by NPOs (Schumann 2013).

Tourism also plays an important role in forest conservation in Komono. This study reveals that ecotourism activities in Komono are focused on the protection of ecosystem services, unlike Desa Taman Jaya, where the focus of ecotourism has been on benefit sharing (Foucat 2002). In Desa Taman Jaya tourism benefits are directly transferred to members of the local communities. These findings are in line with the work of Nurinsiyah et al. 2015, who suggest the application of different ecotourism approaches in different countries.

The local government in Komono plays an important role in promoting ecotourism. The main tourism areas in Komono are Gozaisho Ropeway (the highest ropeway in Japan that shows the beauty of forested mountainous areas in Suzuka Quasi National Park) and Yunoyama Hot spring (one of the famous hot springs in Japan, located in the valleys of mountains in Komono). To promote benefit sharing, the local government in Komono uses a model of benefit sharing with the dual objective of raising the profile of local products and increasing economic returns to the local farmers. Hotel owners in Komono are encouraged to buy local products that are used on a daily basis, such as rice, vegetables, and other ingredients for food preparation. Even though the benefits are disproportionally enjoyed by local farmers in Komono, this policy helps to increase revenue or income level of the local community in Komono. Furthermore, to support local farmers and to promote tourism in Komono, the local government has implemented regional branding (Jones et al. 2009), by promoting original agricultural products and industrial products manufactured in Komono. This includes Komono rice and Makomo. Makomo is a perennial plant which grows in Komono and is used for foods, medicines, and cosmetics material. The regional branding in Komono is seen as an efficient way to promote pride and sense of ownership of the natural resources.

Another factor that influences conservation or how forest resource is utilized in Komono is the values held by the local communities and their attitude towards traditional knowledge. The willingness of local communities to preserve traditional values in Komono can be seen through their participations in traditional gatherings. Traditional events and local gatherings are often used to promote culture, conservation values, environmental education, and technology. In Komono, the locals have a festival called Ikeboshi (which means; drying pond). This festival is often held in Tabica District. The festive activities are motivated by environmental protection initiatives. Recognitions of the concept of forest conservation by members of the rural communities in Komono are numerous, ranging in importance from the most important to the least important, as follows: natural protection from natural disasters, protection of flora and fauna, protection of the landscape area, thinning activities, replanting activities, protection, economic development, and maintaining population. It is clear from the results of the survey that, members of the local communities’ perception of forest value are very high. They value forest more for its environmental and protection functions.

Conservation values have been growing among Japanese people (Hiwasaki 2006). These values have been preserved in the form of traditional events such as, matsuri (festival – Japanese) which is held on seasonal basis. Komono has the himatsuri festival (fire festival – Japanese). This annual festival is held in memory and honour of the “struggling monks”, who were part of a feudal system, many years ago. They were highly respected for their way of life, which enhanced forest conservation. Local people believed their way of life was noble and encouraged forest conservation.

Forest ownership has a big impact on forest management decisions in Komono. Forest ownership in Komono is private, and it is very much like forest ownership in any part of Japan, which is different from most parts of the world. Forest landowners in Japan continue to face declining timber pricing, as a result, most landowners are unable to compensate for the high production costs. The result is, less invested in forest management activities such as silviculture, leading to poor forest management (Matsumura et al. 2013). The combination of declining timber prices and high production costs has led to abandonment of forests by most landowners.

Results of the survey suggests that, in Komono, most respondents advocate for forest conservation to be carried out by NGO/NPOs instead of allowing the government to play a central role. NGOs continue to play an important role in the development of forest conservation activities by assisting in research and volunteering in forest conservation activities such as thinning and final harvest. Local community members mostly view the government as responsible for encouraging tourism and product development. Government plays an important role by assigning most resources to the development of infrastructure in the forest industry and other public sectors. There is another view that government should consider forestry and agriculture secondary, to other sectors such as water
supply or public transportation (Komono Town 2014). Komono has Mori No Kaze, a forest NPO that operates in the Mie Prefecture. Mori No Kaze supports conservation by encouraging local communities to partake in conservation activities such as forest thinning, providing assistance in research, promoting new technologies and knowledge on conservation and environmental protection.

3.3. Further discussions

The results of this study suggest that the relationship between respondent's background (i.e., age, gender and education) and their answers reveal the attitude of local community members towards forest resource conservation and management. Data on age and gender of respondents can be found in Table 2 while the data on educational background is shown in Table 4.

Table 4. Number of respondents by education in Komono and Desa Taman Jaya.

| No | Education                  | Komono (people) | (%) | Desa Taman Jaya (people) | (%) |
|----|---------------------------|-----------------|-----|--------------------------|-----|
| 1  | Elementary School         | 0               | 0   | 14                       | 15  |
| 2  | Junior High               | 3               | 5   | 39                       | 42  |
| 3  | High School               | 24              | 39  | 28                       | 30  |
| 4  | Undergraduate             | 23              | 38  | 5                        | 5   |
| 5  | Graduate and Post Graduate| 2               | 3   | 0                        | 0   |
| 6  | Not mentioned             | 9               | 15  | 6                        | 7   |
| Total |                        | 61             | 100 | 92                       | 100 |

The results of the regression analysis between respondents’ background (age, gender, and education) and the answers to several important questions for the study in Desa Taman Jaya and Komono, are displayed in Tables 5, and 6.

The results indicate that in Desa Taman Jaya, the variation among independent variables are wider compared to the case of Komono. The data gathered reveals the relationship between the independent variables and the answers provided by the respondents. The variable, age, has positive relationships with question numbers 1, 3 and 9, in Table 5. These positive values explain that older interviewees, responded “yes” to questions 1, 3, and 9 in Desa Taman Jaya. This analysis supports the results of the finding that older people are more involved in forest harvesting and/or working on farmlands. The variable gender (male over female) has positive relationship with question numbers 4a, 9, 10, and 13, and a negative relationship with question numbers 3 and 4b. This explains that males are more involved in farming and forest utilization, but when it comes to non-timber products, women are more involved in that forest utilization benefit. The variable education has a negative relationship with question 6 and a positive relationship with question number 14. This explains that the more educated the respondent, the less likely they are to believe in the sacred value of wildlife and also, fewer local community members have knowledge about conservation in Desa Taman Jaya. This study shows that policy makers can use these findings to encourage the involvement of more local people in forest resource utilization or involvement in forest management and conservation activities.

Statistical analysis of the results from the study in Komono shows that we could not establish a strong relationship between the respondents’ background as independent variable and the answers to the questionnaires because most respondents did not provide information on their background. The homogeneity of the data also made it difficult to find the regression relationship. Instead of the relationships with respondents’ backgrounds, we analyzed the relationship between one and other questions by analyzing the trend of answering yes to the questions using hierarchical clustering model. The clustering model was done for questions with multi-answers.

The cluster dendrogram for question 9 in Table 6, shows the trend of respondents answering questions based on their understanding on environmental protection. The cluster dendrogram shows the following protections: protecting nature (A), protecting precious flora and fauna (B), protecting natural landscape (C), thinning activities (D), eliminating uncultivated lands (E), moderating economic development (F) and keeping the population moderately (G). From this cluster dendrogram we found two groups with similar answer patterns; [group 1] people who chose A, B, and C and [group 2] people who chose D, E, F, G. The dendrogram for question number 12 shows the trend
Table 5. Regression relationship between respondents’ backgrounds (age, gender, and education) and answers in Desa Taman Jaya.

| Quest. No. | Questions                                                                 | Age  | Male /Female | J. High | High | Educations* | Not Mentioned |
|------------|----------------------------------------------------------------------------|------|--------------|---------|------|-------------|---------------|
| 1          | Do local people get forest resource for fire fuel, fodders, and medical plants | 0.080| -            | -       | -    | -           | -             |
| 2          | Is it easy to get them                                                     | 0.053| -            | -       | -    | -           | -             |
| 3          | Do local people cut wood from forest to be sold                             | -    | -            | -       | -    | -           | -             |
| 4          | Do local people harvest non-timber products to be sold                       | 0.102| -1.200       | -       | -    | -           | -             |
| 5          | Do local people participate in ecotourism activities                         | -    | 1.507        | -       | -    | -           | -             |
| 6          | How often do local people actively join the discussion of regulations in UKNP | -    | -            | -       | -    | -           | -             |
| 7          | Do local people believe in the sacred value of Javan Rhino                 | -    | -            | -1.674  | -0.685| -1.540      | -17.720       |
| 8          | Do local people join religious meeting actively                            | -    | -            | -       | -    | -           | -             |
| 9          | Do local people have land to farm                                           | -    | 17.000       | -       | -    | -           | -             |
| 10         | Do local people rent field to farm                                          | 0.083| -            | -       | -    | -           | -             |
| 11         | Do local people participate in Village Conservation Organization             | -    | 0.956        | -       | -    | -           | -             |
| 12         | Do local people understand about conservation                               | -    | -            | -       | -    | -           | -             |
| 13         | Do local people know about NGO that’s active in conservation activities in the area | -    | 1.074        | -       | -    | -           | -             |
| 14         | Do local people know about the leader of the Government Association of UKNP | -    | 0.270        | 1.792   | 1.204| 0.105       | -             |

of answering by local people through the lens of promoting thinning activities in Komono Town. Here the cluster dendrogram show the following: leave it to the forest owners (A), leave it to forest union and forest entity (B), promoted by the municipality with subsidy (C), leave it to NPO (D), promoted by municipality without subsidy (E), promotion of the use of biomass (F) and promotion of the use of wood stove (G). Answer B and C has the greatest number of respondents with the same level in the dendrogram, followed with A and F, then E with the same level as D and G. From dendrogram analysis, there are two groups that show concern of natural protection and concern of economic development from forest. From this study we can say that encouraging people who are actively involved in forest utilization activities (e.g. ecotourism) to share their experience can be one way to attract younger people to become active in forestry.

4. Conclusion

Comparative study of the involvement of local people in forest resource utilization in both Japan and Indonesia has enhanced our knowledge on the role of public participation in forest management. The results of this study revealed that limiting access of local people to forest resources, resulted in a reduction of the benefits enjoyed by local people in Desa Taman Jaya, as well as an active over exploitation of forest resources. The study also shows that in Komono, a landowner’s decision to carry out forest management is highly dependent on economic returns to the landowner. The study has also shown that forest resource conservation is enhanced through governmental actions such as the promotion of local values. This was found to be more pronounced in Komono compared
Table 6. Regression relationship between respondents’ backgrounds (age, gender, and education) and answers in Komono.

| Quest. No. | Questions                                                                 | Age | Male/Female | Educations * |
|------------|---------------------------------------------------------------------------|-----|-------------|--------------|
| 1          | Do local people get forest resource for fire fuel, fodders, and medical plants | -   | -           | -            |
| 2          | Do local people cut wood from forest to be sold                            | -   | -           | -            |
| 3          | Do local people harvest non-timber products to be sold                     | -   | -           | -            |
| 4          | Are local people actively working on natural conservation activities in the park area | -   | -           | -            |
| 5          | Do local people participate in ecotourism activities                       | -   | -           | -            |
| 6          | Do local people participate in local festivals actively                    | 0.082 | -           | -            |
| 8          | Are local people proud of SQNP                                             | -   | -           | -            |
| 9          | Do local people understand the meaning of environmental protection         | -   | -           | -            |
| 10         | Do local people know about NGO that’s active in conservation activities in the area | 0.045 | 1.169       | -            |

Figure 3. Cluster dendrogram for Question 9 and 12 in Komono

to Desa Taman Jaya. In Komono local people take pride in natural resource conservation such as the preservation of national parks and this was exhibited by their willingness to partake in local gatherings and festivals. At these gatherings and festivals, they share all kinds of conservation values among the local people. It was also clear from the study that in Desa Taman Jaya, there were varying degrees of the awareness of conservation values by local people which was dictated by their educational background. We concluded from the responses on the questions related to forest management, that in both study areas local community member prefer to see NGO’s play a more significant role compared the government.

We also concluded from the study that low levels of education and employment in Desa Taman Jaya can be blamed for the low standard of living or poverty in most rural areas in Desa Taman Jaya. In the case of Komono, the study showed that most of the local people are gainfully employed. Most work in various industries in neighboring cities. We were able to establish a difference in standard of living in the two locations using background information on the respondents. From this information we also concluded that respondents in Komono were more homogenous compared to those in Desa Taman Jaya.

For a take-away, this study suggests that policy and decision makers should encourage the participation of local people in forest resource conservation and management by taking measures to highlight economic benefits from forests. These measures could include using the “bully pulpit” of government policy makers to promote things like non-timber forest products and ecotourism. Policy makers should also be more concerned with local people’s perspectives on forest benefits, local values, and forest management, by considering background information such as age, gender, and education levels. Finally we conclude that by encouraging the involvement of local people in forest management, it will make them pursue an active role in forest conservation and wildlife protection in Desa Taman Jaya and may increase the economic returns to landowners in Komono.
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