

COMMUNITY PARTICIPATION IN BAMBOO FOREST MANAGEMENT IN KITAKYUSHU CITY, JAPAN

Kana Tamiya*

Department of Law, The University of Kitakyushu, Japan

Abstract

The fast growing bamboo causes problems in Kitakyushu as it is able to invade other plant areas. Bamboo forests that are growing too fast are often left without being properly cared for by landowners. This worsens the condition of the balance of the ecosystem in this bamboo forest area. In this study, an investigation was carried out on efforts to manage bamboo forests in Kitakyushu City, especially those involving the community. Efforts to manage bamboo forests are carried out by the government and the community in Kitakyushu City. The volunteers come from students and the general public. Activities carried out include providing experience for community members to cut bamboo trees, make musical instruments from bamboo and perform performances using these musical instruments. This activity instills awareness in the participants to better maintain the balance of the existence of this bamboo forest. The potential for the use of bamboo is actually very wide open, both as a musical instrument, souvenirs, cooking ingredients, construction materials, activated carbon and others. However, efforts to increase the benefit value of these products still have to be made to compete with other raw materials.

Keywords: *bamboo forest, community involvement, fast growth, invasion, bamboo utilization*

Introduction

Bamboo is a plant that is easily found in tropical and sub-tropical regions (Mei et.al, 2015). There are more than 1000 species of this bamboo with its use since time immemorial. Bamboo is a plant that grows well in Japan, especially in the central and southern regions of the country. Kitakyushu is a city located on the island of Kyushu, in the southern part of Japan. Bamboo forest is very easy to grow in this area. Types of bamboo that grow in Japan include *Phyllostachys pubescens* and *Phyllostachys edulis*. Moso bamboo is a type of giant bamboo which is very famous in Japan. This type of

bamboo is found in the tourist areas of the bamboo forest.

Due to its fertile growth, bamboo forests are easily expanded, meanwhile the use of bamboo as a building material has been increasingly abandoned. The nature of bamboo that dominates other plants is also a problem because it causes bamboo forests to invade other plantations (Kusaba et.al, 2008). Apart from being used as a building material, bamboo shoots can also be taken which are still very easy as a food ingredient. Bamboo shoots just emerging from the ground are an expensive menu. This resulted in reduced demand for Japanese bamboo shoots when cheaper imported bamboo shoots were made available from China (botaniboy.org, accessed March 19, 2021).

The condition of the expanding bamboo forest which can cause this problem needs to be

*)Corresponding Author:
E-mail: z8421048@law.kitakyu-u.ac.jp

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handled properly. Several activities are carried out voluntarily by the community to manage this bamboo forest. This study aims to investigate the activities that have been carried out to anticipate the problem of this very rapid growth of bamboo. Activities that are focused on are those carried out by the community, especially groups of university students. In this study, it was also obtained the sustainability of the activities of the community that carried out the management of the bamboo forest. In addition, this study also aims to identify the potential uses of bamboo to offset the fast growing growth of bamboo in Japan.

Methodology

This study is formulated using several activities. In the first part, we identified the problems faced by the existence of bamboo forests in Kitakyushu City. Then, reporting on participation in voluntary activities for bamboo forest management. In the implementation of this activity, things that are done by the community are observed in relation to their routine events. In addition, observations were made regarding the duration of involvement of community members in participating in the management of this bamboo forest. The discussion in this study is also enriched with the identification of the potential uses of bamboo through a review of the literature, both from popular and scientific publications.

Result and Discussion

Bamboo Forest Problems

For more than 10 years, bamboo forests in Japan have become one of the ecological problems due to their rapid growth. The growth rate of bamboo can reach 30-100cm per day depending on the season (Francois et.al, 2019). This fast growth is not balanced by its utilization. As a building material, bamboo has been replaced by plastics and other materials. In terms of durability, bamboo is weaker than plastics and other materials. But actually bamboo really

supports the use of environmentally friendly materials.

Another problem caused by the bamboo forest in Kitakyushu City is its ability to invade other plant groves. The dominance of bamboo growth resulted in reduced growth of other plants. Moso bamboo has a high allelopathic effect, resulting in other plants not being able to grow well in the vicinity (Teixeira da Silva et.al, 2015).

Community Activities

Bamboo forest management is promoted to the people of Kitakyushu City and is associated with programs to achieve the SDGs (Sustainable Development Goals). Communities are formed from voluntary communities with the aim of introducing more bamboo plants and participating in managing bamboo growth in Kitakyushu. Many of the general public think that bamboo forests are not a problem for nature, so one of the activities of this community is to provide an understanding of the issues faced due to the rapid invasion of this bamboo forest.

Some of the events carried out in the bamboo forest management community are the cutting down of bamboo trees that are expanding too fast (Fig. 1). In this event, volunteers can feel that fresh bamboo is quite difficult to cut down manually. Some of the land invaded by bamboo forests is owned by old people who are unable to maintain their land by cutting down these bamboo trees. Community members were also given experience in making musical instruments made from bamboo such as the violin, cello, ukulele, and percussion, assisted by a community organization called Chikurin Kyoshin. The use of bamboo as a material for making musical instruments has been done for a long time (Horner, 1998).



Figure 1. Bamboo cutting down experience.



Figure 2. Musical instrument made of bamboo.

Not only were they given experience in making musical instruments made from bamboo, volunteer members also performed live performances playing these instruments at the Kitakyushu Eco Live Stage. This event is the biggest SDGs event in Western Japan. Another event that was attended was the Satoyama Matsuri (Satoyama Festival) whose activities were aimed at bringing people closer to nature. At this event, bamboo is used for tableware.

The people involved in the volunteer activity for bamboo forest management come from various institutions. Kitakyushu University has an

educational center called Lab421 which aims to involve student activities in solving problems in the local community together. Students joining this education center can choose the activity topics they want, for example peace, environment, etc. Each topic is carried out in collaboration with local organizations. Student involvement in Lab421 activities can be carried out since the first year and each year they can choose a different topic. Bamboo forest management is one of the topics that can be followed by Lab421 members. Apart from universities, volunteers for bamboo forest management also come from other parts of the community, both individually and in groups.



Figure 3. Bamboo as tableware.

Voluntary community involvement in the management of this bamboo forest is not limited to the duration of time. There are quite a lot of people who continuously carry out activities to promote the use of bamboo and maintain the balance of the bamboo forest in Kitakyushu. University students are usually intensively involved in bamboo forest management activities for 1 to 4 years. This duration is determined according to the topic taken

according to existing projects. The duration of student involvement is also determined by the length of the lecture. The volunteer activities of students who have graduated from university are usually continued by their juniors.

For people who are involved in the bamboo forest management community, awareness of the anticipated problems they are facing is increasing. Newly joined volunteers, including students from university, gained new knowledge and experience related to environmental issues due to the rapid growth of bamboo forests. In addition, additional information was obtained regarding the use of bamboo for several purposes. The motivation to choose bamboo as an environmentally friendly daily necessity is also increasing. The important result obtained is that efforts to contain the invasion of bamboo forests can be carried out properly.

Potential Utilization of Bamboo

The use of bamboo as a musical instrument is still carried out by certain communities, especially in areas that preserve the culture of their ancestors. However, the number of bamboo musical instruments is rarely used for professional musician activities, so the absorption of bamboo for the purpose of making musical instruments is not significant. However, it is hoped that each school can complement its music lesson activities by having this bamboo musical instrument as material to enrich students' knowledge.

As a building material, bamboo has also been popular since time immemorial. Although bamboo is relatively strong against earthquake shocks, its nature as an organic material that can be decomposed makes it more widely used for non-construction materials. Efforts are needed to increase the durability of bamboo in an environmentally friendly manner so that it can be used as a construction material for a long time (Kaur, 2018).

Bamboo shoots, the new growing part of young bamboo, are a food ingredient that is on the menu, especially in Asian countries. China exported bamboo shoots to Japan at low prices, so the use of bamboo shoots in Japan did not develop. However, bamboo shoot harvesting should continue for bamboo that has the potential to invade other crop areas. Thus, the price of bamboo shoots can compete with imported bamboo shoots. The benefits of consuming bamboo shoots include improving digestion, reducing excess body weight, treating cardiovascular disease and cancer (Chongtham et.al, 2011).

Bamboo charcoal has been proven in research to function as a water purifier as activated carbon works, especially when used in multilayers (Han et.al, 2017). The use of activated carbon has been carried out by the community to improve the quality of rivers in the upstream areas. Bamboo charcoal has good potential as a promising precursor in the production of activated carbon to offset existing activated carbon products on the market (Mahanim et.al, 2011).

There are several other uses of bamboo such as fiber raw materials for textile and paper products. However, the production process requires supporting materials and energy which are still questionable in relation to environmentally friendly processes. It is feared that these processes will actually damage the environment.

To support the potential for intensive use of bamboo, it is necessary to increase the benefits that consumers can get from using bamboo. In addition, increasing public awareness of the need to participate in solving the issue of bamboo forests must also be continuously pursued.

Conclusion

The existence of communities that carry out activities in bamboo forest management is very impactful, especially in terms of increasing public awareness of the importance of maintaining a balanced ecosystem in Kitakyushu. Events held in this community also increase the knowledge of its members about bamboo and its uses. This activity needs to be carried out continuously, balanced with technological improvements to the use of bamboo so that consumers can steadily replace the materials they usually use with bamboo-based products.

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