

Title	登山者の知識が高山植物の貨幣価値決定に与える影響 白山国立公園における高山植物保全を事例にして
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The contribution of knowledge to the evaluation of economic value of natural resources:  
A case study of climbers for alpine flower conservation at Hakusan National Park

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The National Parks of Japan are places that allows the Japanese people to explore nature and untouched wilderness. The parks are scenic areas where visitors can enjoy nature as well as the culture of the people living there. There are many attractions and activities available in the National Parks, like climbing, visiting hot springs, skiing, and scuba diving. Furthermore, national parks promote the protection and responsible use of the natural environment. On the other hand, the excessive utilization and breach of regulations by users have a negative influence on the eco-systems and natural landscapes, for example the destruction of vegetation (like alpine flowers) being tread upon by climbers. It has been reported that climbing trails are being widened on the sides because of visitors walking beside the trails at Hakusan National Park. Rehabilitating these areas is difficult and will be very costly in terms of money and time.

The conservation of natural resources in the National Parks is dependent upon tax money paid by Japanese citizens. However, the budget for the conservation of natural resources tends to decrease every year. Furthermore, a law which the administrator can impose one of administration expense of the park on beneficiary was established. However, for all the National Parks of Japan, the amount of collected fees—such as admission fees—does not reach the expected level, except for one of the Parks. Therefore, an environmental assessment of the means necessary to convert environmental value—which is free and often taken for granted—into money needs to be developed in the academic field of environmental economics. The purpose of this environmental assessment is to support better decision making by creating a visualization of the often confusing environmental value of national parks.

The first action for the study concerning the administration of the Park is dividing the concept into “a discussion in a capacity as administrator” and “a discussion focusing on the trends of users.” The former section addresses constructing an appropriate framework for maintaining climbing trails. However, it is a philosophy that is how concert and get the show on the road as an administrator, and it fails in philosophy that utilization experience also has been conserved well as a user. The latter examines whether putting these frameworks in place will satisfy the user or make them uncomfortable. However, the study needs to analyze the relationship between conservation and the economy as well as the knowledge of users while looking ahead to ensure the efficiency and sustainability of implementing these new frameworks.

Furthermore, there are existing studies concerning the relationship between knowledge and

environmental consciousness. These studies propose that knowledge of the environment has an influence on interest, incentive, and action regarding being environmentally friendly. Additionally, from an education perspective, the manner of learning or teaching also affects the environmental consciousness modification of people. However, studies analyzing how learned knowledge exerts an influence on environmental consciousness are very few.

The purpose of this study is to analyze the relationship between the willingness to pay (WTP) of climbers for alpine flower conservation and the knowledge of climbers about the alpine flowers, while assessing the alpine flowers at Hakusan National Park using the contingent valuation method (CVM). First, we calculate the economic value of alpine flowers by determining how the climber felt at Hakusan National Park. Second, we analyze the effect on the WTP decisions for alpine flower conservation, focusing on the difference in the amount of knowledge and the acquisition process concerning the alpine flower.

The Hakusan National Park is located near Ishikawa, Toyama, Fukui, and Gifu. The height of the main peak “Gozenamine”—which located the center of the Park—is 2702 m. The Hakusan National Park was declared as a Quasi-National Park in 1955, and a National Park in 1962. The area size of Hakusan National Park is 49,900 hectares. Because the climbing path has been under maintenance, people of all ages can climb the mountain, and therefore the main application of Hakusan is climbing. According to popular conjecture, the number of the climbers is between 50,000 and 60,000 per year. There are over 250 species of alpine flowers growing in Hakusan, and approximately 100 species grow only in the far western area of the park. Although there are no endemic species in Hakusan, 18 species of flowers are named with the word “Hakusan” in the standard Japanese names. This is the result of a plant survey which was carried out in ancient times, with Hakusan being the first place where these plants were discovered. Moreover, there are presently 16 species of introduced plants that have been confirmed. Three problems concerning the overgrowth of the introduced plants have occurred. The first is a change in the landscape, and the second is that the local species’ habitat is under strain and getting smaller. The third is that the local species are hybridizing with the introduced plants, leading to crossbred species growing in the Park. There are also reports concerning hybridization in Hakusan, and the removal of these introduced plants has become a priority.

There are three reasons why Hakusan National Park was chosen as the target for this study. First, the budget for Hakusan’s deteriorating facilities and scientific research is not enough. Second, there are many climbers who have an interest in alpine flowers and that have become involved in the protection of these plants. Third, there is no mechanism for collecting fees for using the park, for instance the collection of entrance fees at the Park gate.

This study uses a questionnaire that includes CVM to gather data concerning the climbers of Hakusan National Park. CVM is an evaluation method that determines the value of the environment by presenting a virtual scenario that the environment has changed to the questionnaire respondent and asking them how much money should be paid for the scenario. In this survey, a scenario was presented assuming that the alpine flowers which can be observed from the mountain climbing path will disappear. Furthermore, according to the method of CVM, the names and the features of “*Fritillaria camtschatcensis*,” “*Geranium yesoemse* var. *nipponicum*,” and “*Campanula lasiocarpa*” were presented to the climbers to quantify their knowledge of the plants.

The results show that the WTP for protecting the alpine flowers in Hakusan is 846 Yen (median value) and 896 Yen (average value). This means that if there are 50,000 climbers per year in Hakusan National Park, the WTP can be translated into annual benefits of 4,230 Yen and 4,480 Yen respectively. As the direct cost to the government for Hakusan from 2010 to 2018 was 130 million Yen, the annual benefits in the results could contribute 30% of this cost.

These results show the relationship between environmental knowledge and WTP concerning the alpine flower of the climbers by using a statistical analysis. As a result, a significant 1% difference has been confirmed. This indicates that people who are familiar with alpine plants have a higher WTP. Moreover, we analyzed the relationship of intention to pay and the difference in the acquisition process of knowledge, but no significant relationship was confirmed. Lastly, the results also show that many of the climbers acquired their knowledge as follows: “Learned from friends,” “learned at facilities like mountain huts,” and “self-taught through books and the Internet.”