



## Short communication

## Culture and climate change: Japanese cherry blossom festivals and stakeholders' knowledge and attitudes about global climate change

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## ABSTRACT

Most global climate change models predict serious ecological and social problems. In Japan, biologists have found climate change is affecting species and ecosystems, including the earlier flowering time of cherry trees which are an important cultural symbol in Japan. Cherry blossom festivals are also important to local economies. This study explored the perceptions of Japanese residents regarding climate change impacts on culturally significant events such as flower timing of cherry trees. We conducted interviews of stakeholders of three cherry blossom festivals, including sixteen organizers of festivals and 26 managers of festival-dependent businesses, to understand their awareness, attitudes and behaviors toward global climate change and impacts on cherry blossom festivals. Most organizers of the festival in Kakunodate were concerned about global warming and its impact on cherry blossom times while organizers of festivals in Nakano and Komoro felt it was unimportant if flower timing affected the festival schedule. Most (92%) managers of festival-dependent businesses mentioned that global warming is occurring and affecting the flower timing of cherry trees, but there were diverse perceptions of global warming impacts on their business. Managers more dependent on income from cherry blossom festivals indicated greater concern for the effects of climate change.

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### 1. Introduction

#### 1.1. Culture and climate change

Climate change has started to affect people's livelihoods and culture worldwide in the last decades (Crate and Nuttall, 2009). In Siberia, native Sakha horse and cattle breeders are having difficulty raising livestock due to increased snow from warmer winter temperatures (Crate, 2009). The Inuvialuit people in Canada's western Arctic are adapting to climate change with short-term responses, such as switching prey species, and long-term cultural changes, including intercommunity trade and new hunting seasons (Berkes and Jolly, 2001). These cases reflect the importance of examining the influence of climate change to the survival of the world's diverse cultures (Crate and Nuttall, 2009).

An analysis of 37 international polls, which included Japan, showed that a majority in all countries agreed that global warming is a serious problem (World Public Opinion.org, 2007), yet little individual or collective action has occurred to address this problem. In Japan, public opinion polling between 2005 and 2007 revealed that 10–52% of respondents thought the environment/global warming was a serious issue for the world, yet only 1–6% listed it as a serious issue in Japan (Sampei and Aoyagi-Utsui, 2009). The majority of Japanese recognized the term “global warming,” yet could not explain what it was (Aoyagi-Utsui, 2006). This study examines the perceptions of people involved in Japanese cherry blossom festivals, a culturally significant annual event for centuries, their awareness of the impact of climate change on flowering time, and how they are adapting to changes. Further, we investigate if people who are more economically dependent on cherry blossom festivals have a greater concern about the effects of climate change in Japan.

#### 1.2. The effect of climate change on cherry blossom festivals

Cherry trees, the national flower of Japan, have symbolic meaning and cultural significance in Japan. Japanese people have

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traditionally appreciated the flower; the oldest song book in the world, *Manyōshū*, edited around 600AD, has songs about the beauty of cherry blossoms (Ando, 2004). Millions of Japanese enjoy picnics and parties under the cherry trees during peak cherry blossom flowering (ABC News, 2009). Hundreds of festivals are hosted across Japan. Among several species of cherry trees inhabiting Japan, the Japanese mountain cherry (*Prunus jamasakura*) and *Somei-yoshino* (*Prunus yedoensis*) are the most famous, and widely planted (Primack and Higuchi, 2007; Primack et al., 2009a).

Ecological and biological studies report that climate change is affecting species and ecosystems in Japan (Doi and Takahashi, 2008; Kojiri et al., 2008; Primack et al., 2009b), and is contributing to the early flowering of cherry blossoms (Aono and Kazui, 2008; Higuchi, 2008; Ministry of the Environment, 2008). According to research in Kyoto, the average flowering date during 1971–2000 was 7 days earlier than an average of the previous 1200 years (Aono and Kazui, 2008). At Mt. Takao, 45 km west of Tokyo, cherry trees are flowering an average of 5.5 days earlier than the previous 25 years (Miller-Rushing et al., 2007). Flowering dates were earlier in urban than rural areas; cherry trees in central Tokyo flowered 8 days earlier than nearby rural areas (Primack et al., 2009a).

Change of flower timing has ecological implications and social impacts. However, few studies have explored whether Japanese residents understand the link between climate change and culturally significant events such as cherry blossom flowering. In order to involve the public in adapting to climate change, it is necessary to understand what they already know and believe about global warming, and where misperceptions or knowledge gaps occur (Bostrom et al., 1994). In this study, we conducted a survey of stakeholders associated with three cherry blossom festivals in two rural sites and one urban site. Communities differ in how people perceive risks (Crate and Nuttall, 2009) and it is critical to focus on the regional perception of climate change because people experience environmental change locally and not as a global average. Although people normally have little direct contact or experience regarding global warming (Stamm et al., 2000), we expected that stakeholders of these festivals might have more awareness toward this issue since they need to be sensitive to flower timing. In other words, stakeholders of cherry blossom festivals are on the “front-line of climate change” since their livelihoods depend on matching their festival dates to the flowering of cherry trees (Broadbent and Lantto, 2009). Our objective was to understand their knowledge, attitudes and behaviors regarding climate change, and their perception of the influence of climate change on cherry blossom festivals. The goal is to understand how consideration of the impacts of climate change on a culturally important event influences stakeholders’ perceptions of climate change.

## 2. Study site

Surveys were conducted at two rural and one urban festival sites (Fig. 1). Rural Kakunodate town in Akita Prefecture is located in the northeastern part of Japan and the cherry blossom festival attracts 1000,000 visitors every year from the end of April to the beginning of May. As will be described later in the paper, the economy of Kakunodate is more dependant on the cherry blossom festival than the other two sites. Rural Komoro city is a mountainous area located in Nagano prefecture, central Japan. The cherry blossom festival in Komoro attracts about 100,000 visitors every year and is held from the middle to the end of April (Mapple Net, 2009). Urban Nakano-ku in Tokyo attracts around 250,000 visitors every year and is held in the first weekend of April (Fig. 2) (Mapple Net, 2009).

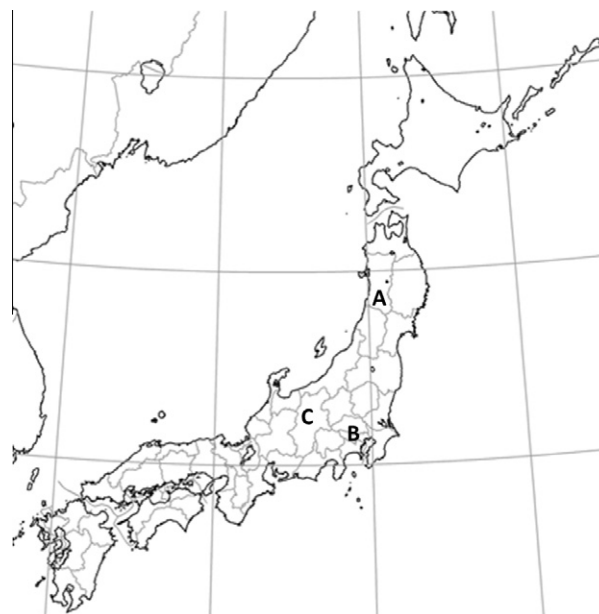


Fig. 1. Study sites: (A) Kakunodate in Akita, (B) Nakano-ku in Tokyo, and (C) Komoro in Nagano, in Japan.

## 3. Survey design and implementation

We conducted personal interviews with: (1) organizers of the cherry blossom festivals, which included staff of local governments and neighborhood associations, and (2) managers of nearby festival-dependent businesses, which included food and curio shops. We arranged in advance the time and date of interviews which followed a semi-structured interview format (McCracken, 1988). In Kakunodate, we interviewed 11 people individually who have been organizing the cherry blossom festival. These included five Department of Tourism and Commerce officials of Senhoku City, two Department of Industry officials of Senhoku City, two board members of the Tourism Association of Kakunodate, one Kakunodate Hotel manager and one Japanese restaurant manager who were members of the Cherry Blossom Festival steering committee. In Nakano, we interviewed the president, vice president, and manager of the Nakano Street Cherry Blossom Festival steering committee. In Komoro, we interviewed the director and manager at Kaiko Park, where the cherry blossom festival is held, who have been organizing the Komoro Kaiko Park Cherry Blossom Festival.

For festival-dependent business managers, in Kakunodate, we interviewed all business managers ( $n = 18$ ) of the stores that depended on business generated during the festival. In Nakano and Komoro, we visited all stores that would be affected by the festivals within 100 m from the sites of cherry blossom festivals (seven stores in Nakano and five stores in Komoro). We interviewed managers at four stores in Nakano and four in Komoro. We could not interview managers at the additional four stores located within 100 m from the festival sites because two were absent and two were too busy to participate. We recognize that sample sizes are small for certain categories.

The interview for organizers consisted of 28 items in three categories: (1) attitudes (e.g., What is your opinion of global warming?), (2) knowledge (e.g., What factors are contributing to the change of climate?), and (3) behavior (e.g., Will you change actions to cope with any change in flower timing?); and took an average of 40 min to be completed. The interview for business managers consisted of 12 items and took around 10 min. In Japan, the word for “global warming” is more commonly used than “climate change.”



**Fig. 2.** A main festival site of the Nakano Street Cherry Blossom Festival in Tokyo (Nakano City, 2009).

and “global warming” implies “climate change” as well (Climate Change Network, 2009). Therefore, we used the word “global warming” in all interviews. The questionnaires are available in the on-line supplemental materials.

All interviews were conducted in Japanese by native Japanese speakers. Although all interviewers reviewed and followed the same interview protocol, interviewer bias at different sites is possible (Groves et al., 2004).

## 4. Results

### 4.1. Effects of global warming

Organizers varied in their responses concerning the effects of global warming on the timing of the cherry blossoms. Ninety-one percentage of organizers in Kakunodate believed that the global warming is occurring and most of them identified global warming as causing changes in local phenomena, such as decreasing snowfall and declining harvest of wild plants and fish around Kakunodate. In Nakano and Komoro, the answers were divided between “yes, global warming is occurring” and “global warming is not occurring much.”

Most festival-related business managers (92%) in the three sites responded that global warming is occurring; only a few were not sure about it. Examples given of evidence of global warming included: “the timing of flowering of cherry blossoms is changing;” “the amount of snowfall is decreasing;” and “summer is hotter than before, so I use the air conditioner more often.”

In response to the question, “what would happen if the festival date missed the blossoms,” 82% of Kakunodate organizers answered that it would be a serious problem if cherry flowers bloom before the Golden Week holidays, the four national holidays during the period of April 29th–May 5th (Fig. 3). Most thought it would influence the local economy of Kakunodate, reducing revenues of shops, booths and hotels. In Nakano and Komoro, some organizers believed people would visit regardless of whether the festival missed the blooms (e.g., “People will feel satisfied even if there are no flowers.” “People will visit the festival even to see the falling petals rather than the full bloom.”) Only one organizer said people would not show up.

The majority of managers believed that changes in the flower timing would influence their business (e.g., “it will affect the number of people coming to the store,”) while others saw little influence of flower timing (e.g., “No problem. Visitors come even though there are not any flowers during the Golden Week holidays.”).

### 4.2. Individual response to climate change

Most organizers at all three sites answered that television and newspapers are their sources of information about global warming. Most business managers answered that television and Internet are their sources of information about global warming in Nakano and Komoro. In Kakunodate, television is the major information source, followed by newspapers.

In response to the question, “how can the festival organizers and business managers cope with the change in flower timing,” eight organizers in Kakunodate proposed specific actions to cope with the change in flower timing and three of them suggested changing the date of the festival depending on the flower timing (e.g., “we will change the festival schedule according to the flower timing”) (Fig. 4). The organizers in Nakano and Komoro also agreed on the importance of changing the festival schedule to meet the flower timing (e.g., “it was all right this year, yet some people concerned are suggesting that we need to revise the date”).

The majority (67%) of managers said that they would not take any special measures to cope with changes in flowering (e.g., “nothing special. I will open my shop as usual.”) However, some proposed specific measures, such as planting different cherry tree species which bloom later. Some managers mentioned that they would cope by checking the blooming forecast and/or increasing their staff only as needed.

In response to the question asking what an individual can do to help minimize global warming, all 11 organizers in Kakunodate, and half the organizers at the other two sites, proposed specific actions that individuals could take. Actions included reducing garbage, not using a car, and saving electricity. Two organizers did not mention any specific action to address global warming, saying “there is a limit to what individuals can do.”

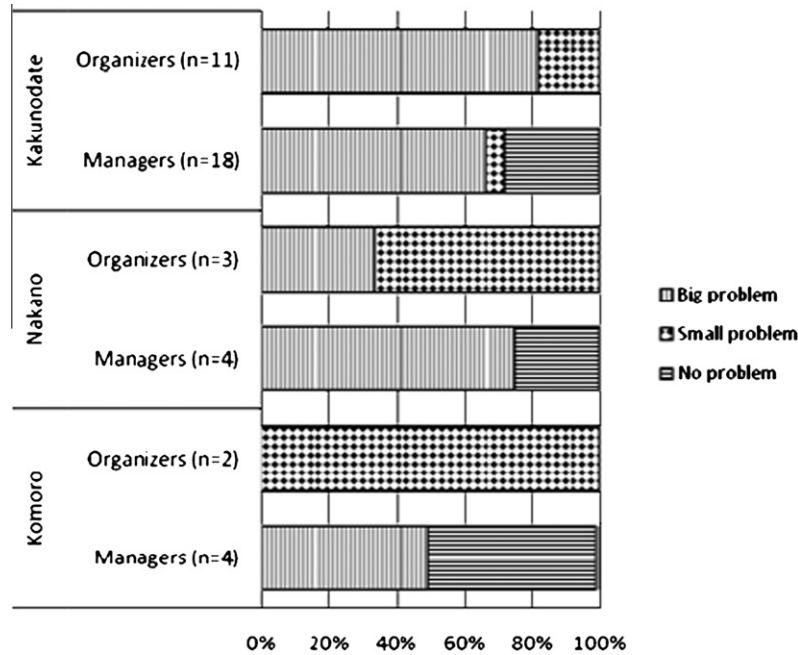


Fig. 3. Responses to the question, "What if the festival missed the blossoms?".

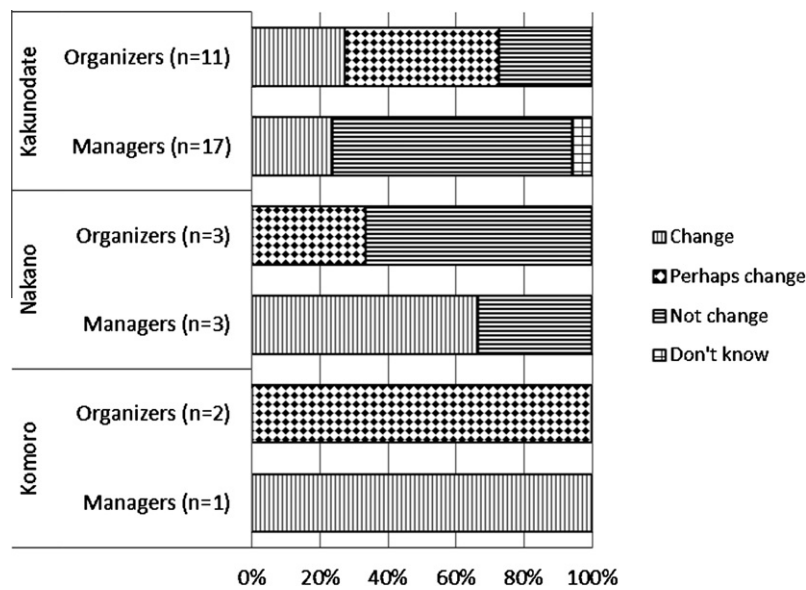


Fig. 4. Responses to the question, "How can you and the festival/store cope with the change in flower timing?".

Most managers in the three sites provided general and specific individual actions to address global warming, such as conserving electricity and turning off lights.

### 5. Discussion

Global climate change has the potential to impact normal citizens' daily lives. In Japan, the Ministry of the Environment (2008) launched campaigns to emphasize the importance of individuals, companies, and local and federal governments to actively adapt to and mitigate impacts of global warming. Most respondents said that newspaper, television and Internet are the main sources of information about global warming, indicating the significant role of these media in disseminating environmental informa-

tion to the public, and influencing people's perceptions of environmental problems (Russill and Nyssa, 2009; Sampei and Aoyagi-Usui, 2009). Researchers have found that mass media are contributing to public understanding of global warming (Stamm et al., 2000). Yet the large-scale and future time-frame of the impacts also can result in public inaction or apathy.

The goal of this study was to examine if changes in a centuries old, culturally significant event, the springtime cherry blossom festivals, might influence people's awareness of and concern about the need to adjust to or address the impact of global warming. However, in Nakano and Komoro, festival organizers did not feel that it was important whether the festival schedule had to change because of flower timing. This might be because few visitors have complained about the festival missing the flower timing, as the



organizers reported. In contrast, in Kakunodate, the majority of respondents felt global warming was occurring and that it would cause a major problem if the festival missed the flower timing. More organizers in Kakunodate than the other two sites mentioned the necessity of changing the festival schedule depending on the flower timing and mentioned specific actions that individuals could do to help mitigate global warming.

The majority (92%) of managers of festival-dependent businesses thought that global warming is occurring and that it affects the flower timing of cherry trees. While few respondents in Nakano and Komoro mentioned that the change of flower timing is an important issue or pressing matter, the majority of business respondents in Kakunodate thought it would be a large problem if the festival does not correspond to flower timing. Most of the managers mentioned that they would cope with the change of flower timing by checking the national timing prediction, increasing their staff, and/or stocking goods early.

In Kakunodate, the organizers appeared more concerned about the relationship between global warming and the timing of cherry blossoms relative to the other two sites. Several reasons might contribute to this difference. First, the change of the flower timing of cherry blossoms in Kakunodate would result in a sharp decrease of visitors to the cherry blossom festival, if the flower timing missed the Golden Week national holidays. In contrast, few national holidays are included in dates of the festivals in Nakano and Komoro. Second, 90% of income of tourism of Kakunodate town relies on the cherry blossom festival (K. Nakamura, personal communication, 2009) making it the most important event for the town. Visitor numbers for the festival of Kakunodate is 4–10 times larger than those for Nakano and Komoro. In 2009, the cherry blossom festival generated about 71 billion yen (more than \$76,000,000) of tourism income which represents about 40% of annual income of Senhoku city where Kakunodate is located (Tourism Department of Kakunodate Town, 2009). This makes it important for organizers and managers of festival-dependent businesses to focus on the date of the festival and the timing of cherry blossoms. Other studies have found that income dependence can lead to greater environmental awareness or conservation behavior (e.g., Morgan-Brown et al., 2010). Most people visit festivals in Nakano and Komoro for only a few hours and rarely stay in the site more than a day (E. Nakazawa, personal communication, 2009). In those sites, the festivals are just one of many income sources for the town. Third, since Kakunodate is famous as an area receiving heavy snowfall in Japan, a decrease of snowfall which might be associated with increasing temperatures (The Meteorological Agency, 2009) also might have enhanced people's awareness about global warming in Kakunodate.

This qualitative research found that change in a culturally significant event, flowering time of cherry blossoms, may influence people's awareness of global warming and their conceptualization of climate change. We found variation in stakeholders' perceptions of the occurrence and potential impact of global warming which might be related to differences between sites and communities (Crate and Nuttall, 2009). Respondents in the area where the festival had greater economic impact were more aware of climate change issues, suggesting future research is needed on cultural and economic values. Future studies should include a greater number and variety of festival sites and a larger number of stakeholder groups and respondents. A better understanding of people's beliefs and sources of information is needed to effectively mobilize the public to address climate change issues.

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