Title

The *Omiwatari* religious ritual: an example of climate change-driven non-economic loss

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Abstract

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Climate change impacts can lead to irreversible losses for which there is no possible substitute, such as the loss of homelands, unique landscapes, or biological species. In the context of cultural heritage, it is preferable to respond to inevitable losses before they occur, or occur fully. Irrespective of the specific loss concerned, response types are reasonably well known: typically, though not exclusively, memorialisation practices such as documentaries and museum exhibitions, or commemoration events. Conversely, what constitutes loss, why, and for whom may vary substantially depending on the specific loss concerned. Such variation has practical and ethical implications for the design of responses to loss. The article reports on one such inevitable losses, namely *Omiwatari*, an ancient Shinto ritual that is at risk from climate change impacts. This case illustrates the practical and ethical implications referred to above, and underscores how ill-prepared society is to manage this type of losses, which are expected to become more widespread. Preparing for these losses involves both assessing impending losses and empowering communities to frame responses to loss. The article concludes with a reflection on two knowledge gaps, namely the notions of human-value trade-offs and value-triggered behaviour. In sum, the case raises awareness about a consequence of climate change that currently escapes decision-making metrics, illustrates the difficulties associated with managing it, and provides pointer on how to do so.

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On February 5th 2018, Rev. Kiyoshi Miyasaka stood on the frozen surface of Lake Suwa. He was wearing his ceremonial attire: a tall rounded hat, black lacquered wooden clogs, and a white robe covering his dark grey ornate tunic. Despite the early hour and the low temperature, members of the Shinto community had gathered in anticipation. Their hopes were fulfilled later that morning, when Rev. Miyasaka, having examined the ice ridges that had formed during the night, criss-crossing the surface of the lake, declared that Takeminakata, the guardian god of Suwa, had crossed the lake during the night, to join goddess Yasakatome, his wife, on the opposite bank.

For centuries, Takeminakata crossed the lake nearly every year. He no longer does.

1. INTRODUCTION

Climate change impacts may result in irreversible incommensurable loss, namely a permanent deprivation from "things" for which there is no possible substitute. Examples include the loss of living creatures, homelands, and cultural heritage sites (1). When widespread, irreversible incommensurable loss can "lead to cascading social and environmental problems", from resources degradation to public health and security concerns (1). Hereinafter, climate change-driven irreversible and incommensurable losses are referred to as losses.

An inventory of losses reported in the literature yielded twenty categories, the most studied of which are "culture, lifestyle, traditions and heritage", "physical health", and "mental and emotional wellbeing" (2). Focusing on cultural heritage, a recent review of the literature notes that there is "a dearth of studies" that explore strategies for managing and responding to loss, and suggests that this is so because of the "dominant focus on future losses", to the detriment of past and impending loss (3).

Understanding past and impending losses is important from both the scientific and practical points of view. First, our ability to reduce loss – and, at times, even prevent it – is contingent upon how well we understand the nature of what is lost, to whom loss matters, and why (4) (5) (6). Second, responses to impending losses are best articulated proactively, as opposed to adopting *post factum* measures (7). This article illustrates the challenges associated with articulating proactive responses to impending losses, through a case of immaterial heritage – a religious ritual named *Omiwatari* and practiced by a Shinto community in Japan.

Against a background of (insufficient greenhouse gas mitigation efforts and) limited effectiveness of adaptation measures, communities will face more and more cases such as that reported in this article (8). Indeed, as documented by the Intergovernmental Panel on Climate Change, examples of impending losses include heritage sites at risk from coastal erosion and sea-level rise, traditions by indigenous groups in the Arctic and in Australasia, and biological species, not least of iconic mammals such a polar bears and giant pandas. Against this background, the importance of understanding how to articulate proactive responses to impending loss becomes self-evident.

2. Case Examination

Shinto is Japan's main religion by number of "adherents", followed closely by Buddhism (9).[1] Although practised to some degree outside of Japan, Shinto remains an intrinsically Japanese religion (11).

Shinto is based on the devotion to the *kami*, a large and growing set of objects of veneration, ranging from landscapes and forces of nature to ancestors and deities (12). Because of the prominence of natural world-related *kami*, Shinto is often described as a 'nature religion' (13).

Until the beginning of the Meiji era, in 1868, Shintoism and Buddhism were functionally inseparable. After a long hiatus that ended in 1946, the close connection between both faiths was gradually restored (10).[2] Today, Buddhists participate in debates about Shinto.

2.1 'God's crossing'

Omiwatari, or God's crossing, is a Shinto ritual that is held annually at Lake Suwa, about 200 km west of Tokyo. The ritual brings together a natural phenomenon and two cultural manifestations associated with it: an etiological myth and weather lore.

Lake Suwa is a tectonic lake, with hot springs under its surface. In winter, when the lake's surface is completely frozen, changes in ambient air temperature cause the ice to expand and contract, leading to the formation of an ice ridge – a miniature mountain range of ice sheets cracked and buckled over each other, forming 30-to-100 centimetre-tall ridges. From one winter to another, the sinusoidal ice ridge appears in the same spot, because of the location of the underwater hot springs and the uniformity of the water currents, the patterns of which are determined by the shape of the lake's basin (15).

The seemingly unnatural regularity of the ice ridge gave rise to an ancient myth, according to which the ridge forms after the passage of god Takeminakata, crossing the lake to visit goddess Yasakatome on the opposite bank.[3] Hanazato (17) recounts the myth thus: both gods once lived in the same shrine, Kamisha, south of the lake; however, further to a dispute, Yasakatome moved to Shimosha, north of the lake, her tears melting the ice as they fell and creating the hot springs at the bottom of the lake; overcome by remorse, Takeminakata visits Yasakatome once a year, walking across the lake during the night.

For centuries, the Shinto community around Lake Suwa has performed purification rites during the three days following the appearance of the ice ridge.[4] Not least, on the day when the ice ridge is

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[1] "According to official statistics, Shinto is Japan's largest religion [...]. Yet only a small percentage of the populace identify themselves as "Shintoists" in questionnaires conducted by the media or by Shinto organizations. This reflects the fact that while many Japanese participate in shrine events and make use of the ritual services offered by shrines, only very few regard Shinto as their religious identity." (10).

[2] The Meiji era spans the period between 1868 and 1912. During this time, the Japanese government severed the connection between Buddhism – a faith originating in China – and Shintoism, to establish a religious underpinning for the nascent Japanese nationalism. Notably, worshiping the emperor as a *kami* was encouraged, as was loyalty to the empire. Further to Japan's defeat after World War II, a new constitution was adopted which, in its article 20, separates religion and state (14).

[3] Ice ridges on lakes have been the object of veneration by different religious groups worldwide. In Japan, the Ainu people, who profess an animist religion, venerated the ice ridges formed on the surface of Lake Kussharo, on the island of Hokkaido (16).

[4] Purification, through ritual practice, is a pivotal aspect of Shinto (18).

declared to have formed, the chief priest of the Yatsurugi Shrine foretells the weather and harvest for the year, as well as events that may affect the cohesion of the local community. He does so by comparing the shape and direction of the ice ridge with those of previous years. The ceremony, which can last over three hours, attracts local and national media.[5, 6] The full set of events – namely, the purification rites, the declaration that that ice ridge has formed or not and, if it has, the weather and harvest foretelling – are hereinafter referred to as 'the religious ritual'.

2.2 Ice ridge formation over time

For centuries, the chief priests of the Yatsurugi Shrine have kept annual records of the date when Lake Suwa froze completely, noting whether the ice ridge appeared (19). To do so, the chief priests were helped by local fishermen (15).[7]

Although the eldest record dates back to 1397, the continuous series of annual records starts in 1443 (19). Despite flaws in the records, mainly associated with the inevitable multitude of observers involved, given that the period of time concerned spans over 20 generations, the data reveal that ice ridge formation is becoming rarer: in the 475 years between 1443 and 1918, the ice ridge failed to form 36 times, whereas in the 104 years between 1919 and 2023, it also failed to form 36 times (21).[8] The increased frequency with which the ice ridge fails to form has been attributed to global warming (22).

Lacking heightened efforts to curb global warming, global average temperatures are expected to continue increasing, to reach about 2.7 °C above pre-industrial levels at the end of the century (23). In light of this estimate, and given the trends summarised in the previous paragraph, it seems plausible to expect that the formation of an ice ridge across Lake Suwa will become rarer still, and will eventually cease to occur.

2.3 Views from the Shinto community

Does it matter if, with the ice ridge failing to form, the religious ritual is eventually lost? If its loss does matter, what can be done to manage the loss process? Responses to these questions were elicited from eight individuals: two Shinto priests, five social-science researchers, and one Buddhist monk. Four of them are based in the Lake Suwa region, and four are based in Tokyo. All respondents were chosen through purposive sampling (24).

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[5] For example, in 2018, the ceremony started at 7 in the morning, at the Hachinjo Shrine. Shinto rituals were performed in Suwa city and Shimosuwa town, which lay along Lake Suwa's northern shores. Shortly after 10 in the morning, the chief priest was engaging in a final ceremony, back at the Hachinjo Shrine. The foretelling started about half-an-hour later. In years when the ice ridge fails to form, the ceremonial observation is conducted to a lesser degree, and the foretelling is omitted.

[6] To a certain extent, the priest himself is the object of media attention, since the chief priest position for the Yatsurugi Shrine has been in the Miyasaka family for several generations.

[7] Between 1444 and 1682, both the date and hour of formation of the ice ridges were recorded (20). Since four-fifths of the observations were made between 4 and 8 in the morning, it is probably safe to assume that the sound produced by the cracking of the ice, as opposed to an actual visual observation, which the night would render impossible, were the basis for the sightings (15).

[8] Between 2017, the latest date reported by Knoll and colleagues (21), and early 2024, the ice ridge only formed once, in 2018.

Figure 1 lists the questions asked and illustrates the relationship between them – namely, the third set of questions that a respondent was asked depended on the response provided to the second question. For all questions, respondents were encouraged to justify their positions.

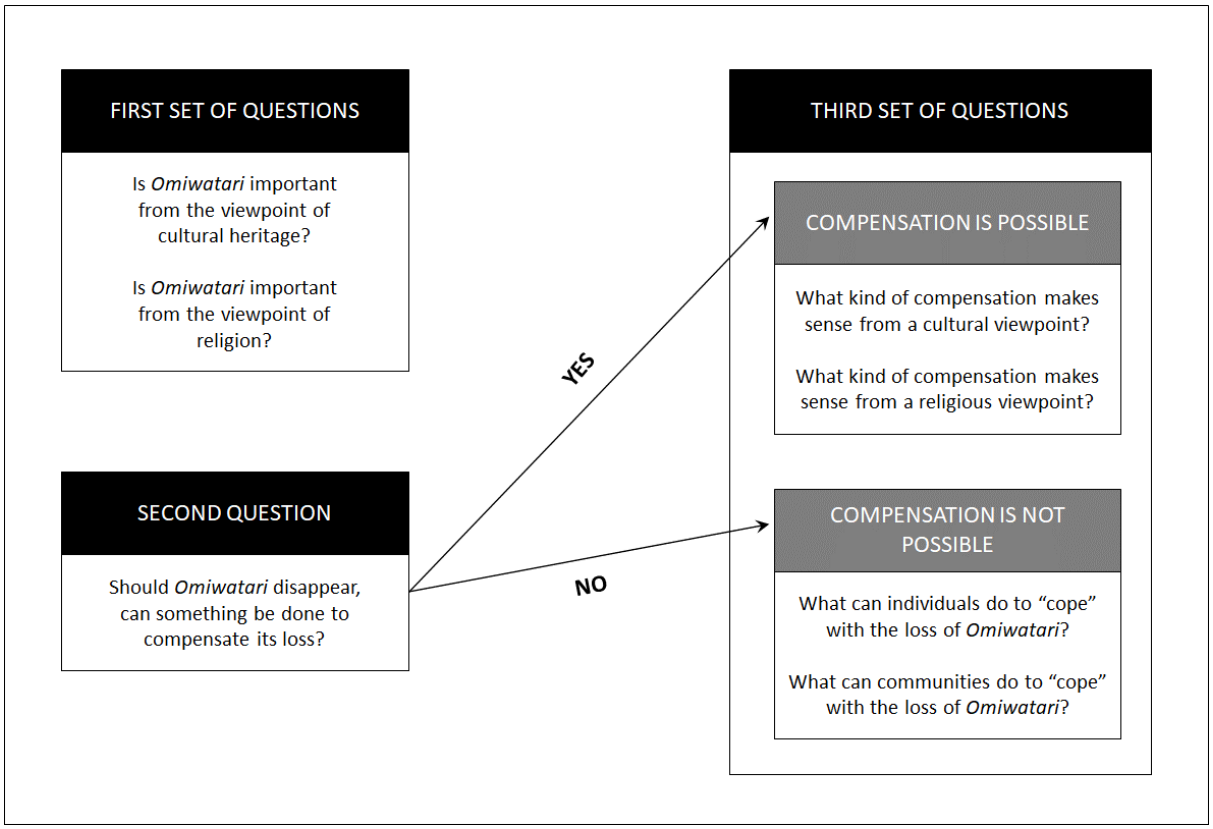

Figure 1: Questions asked and relationships between the questions

2.4 Importance of the ritual

Consistent with earlier research (25), which suggests that consensus is rare, the views expressed were rather diverse. They are summarised in the following paragraphs.

A first set of views suggests that, should the religious ritual be lost, the loss would be of no consequence to Japanese society. According to these views, the ritual cannot be considered a major part of Japan's cultural heritage or Shinto's spiritual patrimony. As such, its loss would be of no significance to the country or even to the Shinto community in the Lake Suwa region.

A second set of views posits that, whereas the loss of the myth would be of concern, the loss of the religious ritual would be of no concern. From this perspective, the myth plays an important function in helping maintain the cohesiveness of the community, which makes the myth a good worth preserving. Conversely, the societal function of the religious ritual is comparatively less important and, for this reason, its loss would be of little significance. Simply stated: compared to the liturgical elements of religious rituals, myths are fewer, more important to the concerned communities, and take much longer to take hold in society. Hence, according to this view, only the loss of the myth would be of concern.

A third set of views holds that the loss of both the myth and the religious ritual would be of great concern, and one cannot separate the myth from the ritual. According to these views, the ritual is the spiritual foundation of the Shinto community in the Lake Suwa region, because the myth corresponds to a *kami* that is unique to that region. Therefore, the loss of the myth and the loss of the ritual weaken that foundation. Already, the absence of the natural phenomenon is reported to have a negative impact on the mindsets of Shinto community members who join other *kami* rituals that take place later in the year in the Lake Suwa region, once the *Omiwatari* ritual is over.

A fourth set of views points toward an epistemological discrepancy concerning the issues at stake. The first question above implicitly contends that all elements in the religious ritual have an intrinsic value worth preserving. (Recall that, in years when the ice ridge fails to form, some of the elements in the religious ritual are omitted.) In contrast, this fourth set of views questions that premise. It does so by arguing that the only value worth preserving is the historic institutional record-keeping function performed by the chief priest at the Yatsurugi Shrine, a function that can be performed irrespective of whether some elements in the religious ritual have to be omitted because the ice ridge fails to form.[9] According to this fourth set of views, humans would be mere observers to changes in the surrounding environment, and should not concern themselves with whether or not the natural phenomenon occurs.

2.5 Management of the loss process

Memorialisation is at the heart of most views on possible approaches to manage the loss of the religious ritual. Media such as videos, still images and books, made available through channels such as television and the internet, and venues such as museums, are commonly suggested. In a similar vein, one of the views expressed advocates for the establishment of an '*Omiwatari* day' – a fixed day in January or February. Such a day would be used to commemorate the loss of the natural phenomenon, and assert the value of both the myth and the religious ritual, thus contributing to prevent that they fall into oblivion.

One step removed from memorialisation is the view according to which the occurrence of the natural phenomenon in places other than Lake Suwa can bring comfort to members of the Shinto community in the Lake Suwa area. Specifically, the example of Lake Kutcharo, in the island of Hokkaido, was mentioned.

A further set of views suggests that both curbing global warming and creating a new Shinto ritual may help manage the loss process. Regarding the first suggestion, reducing greenhouse-gas emissions, directly through one's own actions, and indirectly through purchasing and voting decisions, may help soothe the distress associated with the possible loss of the myth and the religious ritual, by channelling that distress through a proactive action. Here, great emphasis is placed on the need to prevent similar climate change-driven losses, for example in the context of biodiversity. As for the second suggestion, introducing a new *kami* related to managing global warming (地球温暖神) might provide a means to both celebrate the past and ease the transition into a future in which managing the impacts of climate change becomes an even more important societal issue.

The views described in the previous paragraphs focus on the type of potential actions one can take. A final set of views puts the emphasis on the rationale for the actions taken. From this perspective,

[9] Records have been kept in the Lake Suwa area since 1443. Still today, this record is reported from the Yatsurugi Shrine to the Suwa Shrine, and onward to Japan's meteorological agency and to the Imperial Household Agency.

managing the loss process should mainly be about preserving the worldview that the myth and the religious ritual embody – that is, managing the loss process should be about reaffirming the religious belief that would make the possible loss of *Omiwatari* a source of distress in the first place.

Preserving this worldview would entail media and channels similar to those mentioned above. However, the emphasis would be put on the spiritual elements of *Omiwatari*, as opposed to the natural or liturgic aspects of it. For example, recordings of the sound of ice cracking could be used to help members of the Shinto community experience an imaginary *Omiwatari*. Similarly, accounts of how the myth formed, and how and why it gave rise to the worldview referred to above, could help preserve the spiritual aspects of *Omiwatari*.[10]

3. CONCLUSION

We are already experiencing climate change-driven irreversible and incommensurable losses, such as that which is the subject of this article, and we know that more are to be expected (8).[11] Managing this type of losses is better done proactively, as opposed to *post factum* (7). Although we have little experience with proactive responses to loss, some lessons can be drawn from cases such as the climate change impacts that threaten the Japanese religious ritual known as *Omiwatari*.

Even in a relatively small, albeit diverse sample such as that introduced in this article, rather disparate views emerge, ranging from 'no loss experienced' to 'major loss experienced'. What is more, among those who claim to experience loss, the core values that underpin loss relate to different issues, namely the myth, the worldview, or the religious ritual.

These observations bring into sharp focus the difficulty associated with managing the loss process. Simply stated, to whom loss matters and why has great impact on the loss management process. Two issues in particular deserve comment: legitimacy of government intervention, and fairness regarding the actor on which the onus for taking action is placed.

The larger the number of individuals who feel that loss has occurred, the more justified a government-led response might be. Conversely, the smaller the number, the higher the relevance of community- or even individual-driven responses.

This heuristic begs a first open question, namely at which point is government-led action warranted? To answer this question, one needs information about the extent to which the community concerned feels that loss has occurred. At present, the assessments needed to obtain this kind of information are rarely conducted, because the notion of intangible loss escapes public policy metrics (1).

Although the spectrum of options to respond to loss is relatively large, as described above, most such options are inaccessible to individually led efforts. Indeed, preparing museum exhibitions and documentaries, for example, requires community-level involvement at the very least. This begs a second open question, namely is it fair to effectively reduce the number of response options available to those affected by loss simply because they are few in number – and who gets to define

[10] This set of views contrasts greatly with that which contends that *Omiwatari* is essentially a festival (祭り) with social, rather than religious, meaning.

[11] For example, in Australia's Northern Territory, floods damage aboriginal heritage sites that have a spiritual value to the community (26), and in California's Anza-Borrego desert, drier winters reduce the frequency of the socially and culturally significant wildflower 'superblooms' (27).

'few in number'? Social justice and ethics considerations suggest a negative answer, which in turn points toward the need for some degree of proactive governmental intervention.

In sum, *Omiwatari* is an example – and certainly not the only one – that society is ill-prepared for climate change-driven irreversible and incommensurable loss. First and foremost, we must assess this type of losses, while raising awareness about the need to managing them as the best reaction to the inevitability of loss. Second, when a government-driven response is unwarranted, we must empower communities to adopt their own response measures, no matter how small the number of people who feel affected is. Alongside limited resources and awareness, institutional path dependence is likely to be a main obstacle to conducting these tasks (28).

From a scientific perspective, the case reported in this article touches upon two aspects on which research additional research efforts are needed. They are the notions of, respectively, human-value trade-offs, and value-triggered behaviour.

Those who experience loss have different views on where the core value of loss lies – in the myth, the worldview, or the religious ritual. All of them would like to keep all three 'things', but if they can only keep one, their choices differ – ultimately, because human values differ.[12] This observation is entirely consistent with a notion that is novel in a climate change context, namely the notion of human value trade-offs, which is reported elsewhere in the literature (30).

Consistent with the theory of human values (31), there is a difference between the extent to which a value underpins an attitude versus a change in behaviour. Stated differently, the likelihood that an impending loss leads to behavioural change depends on the value that underpins that loss in the first place which, as mentioned above, may vary from one person to the next. Whether or not, for certain losses, there is convergence across values is unknown. Again, in a climate change context, this notion remains novel and warrants further research, given its relevance to managing loss.

Case Study Questions

1. Consider the definition of climate change-driven irreversible incommensurable loss given in the introduction, namely being permanently dispossessed from "things" for which there is no possible substitute. In addition to 'attachment to a place' and 'psychological and physical health' and 'attachment to plants and animals around me', to give but a few examples, what other 'human values' do you think can underpin loss?

2. Consider social norms such as 'peer pressure toward pro-environment behaviour' or 'traditions that guide farming practices', and consider psychosocial factors such as 'risk aversion'. Research is inconclusive as to whether social norms and psychosocial factors underpin loss to the same degree that 'human values' do. What is your opinion? Can you think of examples of social norms or psychosocial factors that could underpin loss?

3. Consider the well-known definition of 'immaterial heritage', according to which oral traditions, performing arts, social practices, rituals and festive events, knowledge about nature and the universe, and traditional crafts all constitute a community's immaterial heritage. Can you think of specific examples of immaterial heritage at risk from climate change in the context of

[12] For example, Graham and colleagues (29) identify five categories of values related to loss driven by sea-level rise: psychological health, safety, belongingness, esteem and self-actualisation. Whereas some people associate loss mainly with the – perceived or real – feeling of reduced safety, other people associate loss with the reduced belongingness that most often goes with relocation.

indigenous peoples – for example fishing practices by Inuit people or nature-based crafts by Sami people? Can you think of similar examples in the context of non-indigenous peoples – for example, *Omiwatari*?

4. Even when loss is irreversible, responses are needed, to help people 'process' the loss. Why do you think this is so? In which ways do you think that a museum exhibition, a documentary or an '*Omiwatari* day' can help the Shinto community in the Lake Suwa region 'process' their loss?

5. Consider the design and implementation of the responses referred to in the previous question. In your opinion, how should government and civil society split responsibilities? Are there cases where you think most responsibility should fall on civil society or even individuals? Are there cases where you think the responsibility should mostly fall on governments? And should it be local governments, or higher levels of government?

6. Consider a case of impending loss that concerns a small number of individuals only. What are the ethical implications of not responding to loss because the share of the population concerned is deemed 'too small'? How do we define 'too small' and who gets to decide on the definition? In the same situation – a case of impending loss that concerns a small number of individuals only –, what are the ethical implications of using taxpayers money to respond to loss? And what are the ethical implications of not responding to loss when only marginalized people are concerned, such as a religious minority or refugees?

7. Past societal transformations have led to the loss of immaterial heritage – for example, in the context of the urbanisation that followed the Industrial Revolution, or in the context of colonisation. Over the next five to ten years, do you think that climate change will have a comparable impact on immaterial heritage? What about in twenty-five years from today?

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