

# The Covid-19 Pandemic and eQOL (Environment-Related QOL)

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## Abstract

This paper not only discusses human QOL (related to happiness and well-being) but also defines the concept of eQOL (environment-related QOL) as human satisfaction in the co-existence of both humanity and nature in a sustainable manner. Among the causes of Covid-19 pandemic, we the authors identify two key factors: excess human contact with nature and the globalization of the human world. Considering Satoyama culture from the perspective of the relations between humans and nature, we can find, in Satoyama, that the ecosystem's balance within nature is maintained and human lives blend into nature as well. On the contrary, excessive human contact with nature inevitably demolishes the balance and harmony between humanity and nature, with the result that eQOL is lost. The Covid-19 pandemic suggests what human might do for the future.

**Keywords :** eQOL (environment-related QOL), Satoyama, COVID-19, Environmental hazard, Sustainability

## 1. Introduction

The Covid-19 pandemic that we are currently faced is changing daily life on a worldwide scale. To avoid the “three Cs” (closed spaces, crowded places, close-contact settings), we are forced to refrain from the most social of actions, that is interacting with other people face-to-face. Japan is also in a very serious situation, with a second state of emergency declared in January 2021, calling on people to stay at home, shortening restaurant business hours, and prohibiting travel across prefectural borders. Daily life is being lost.

The novel coronavirus that has caused all this was already in existence, becoming a threat through contact with human beings. At this time, we have just managed to develop a vaccine to control the infection, but there is still no cure for Covid-19. All we can do just now is to take preventive measures, including vaccination, to reduce the risk of infection.

Academic research is doing all it can, in various formats, to work toward the suppression of Covid-19. Analysis and examination of the coronavirus and its infectious results are taking place from specialist perspectives within the humanities, social sciences, and natural sciences. One of the roles to be played by the humanities here is the investigation of human behavior with regard to infectious diseases created by the contact between nature and humanity. The objective of this paper is to consider this issue in the sense of the relations between humans and nature, that is between human actions and the natural environment. In particular, the discussion of the concept of eQOL (environment-related quality of life) so far provides a key concept for the directionality of this issue. This paper presents a perspective on the coronavirus issue based in the relationship of humanity with nature.

## 2. The coronavirus as an environmental hazard Introduction

Covid-19 is an infectious disease caused by the existing coronavirus, which is transmitted human-to-human. We might refer to this as a kind of biohazard. This virus, which presumably existed somewhere within nature, came to light when something triggered its infection of humans. That is, its beginning was in the contact between humans and

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nature. Currently, the virus is to be found everywhere through its existence in infected people; those who make contact with it are infected and go on to infect others further. In short, the field of the coronavirus has expanded from the natural environment to the social environment known as human society.

In this sense, the coronavirus can be considered an environmental hazard<sup>1</sup> in more than one aspect. First, the virus originally existing within nature has been released into human society through “excessive” human contact with nature, unleashing its force within the social environment. Second, it is based in the global social environment constructed by humans and the economic activity maintained therein likewise, on a global scale. That is, while differences in political ideology remain, economic activity across national borders has ended up spreading the pandemic much more widely.

To begin with, what kind of relations has humanity built with nature?<sup>2</sup> The natural world has changed constantly over its 4.6 billion years of history. Living organisms have done the same. These changes are “natural disturbances,” and for living things, “ecological disturbances.” On a grand scale, these disturbances lead to the destruction and recreation of ecosystems. Biologically speaking, humans are just another kind of organism, and affected by natural disturbances in the same way. Sometimes these take the form of natural disasters. The problem here is how human beings make contact with nature (exposure), and to what degree we can endure natural disturbances (vulnerability). Further, the issue of to what extent we can recover ourselves after the damage caused by natural disturbances (resilience) is also important. In fact, humanity has acquired science and technology and made use of them over and over again to cultivate, and sometimes to exploit, nature. At the same time, we have worked, in a sense coercively, to overcome the environmental hazards of nature through science and technology.

Considering the coronavirus from this aspect, our current human activity consists of a frantic effort to make use of science and technology to overcome this virus encountered by chance. However, we do not seem to have discussed sufficiently the question of why we encountered the coronavirus in the first place. If anything, we need to examine whether we ran up against it by chance or whether we ourselves advanced in its direction.

Further, the second aspect of the “environmental hazard” above is also a serious problem. There is no question that one of the factors in the current Covid-19 pandemic is the worldwide trend toward globalization. Once a pandemic arises, each country attempts to protect itself by means of entry restrictions or closed borders. Even then, business travel cannot be entirely halted. As well, globalization for the purpose of economic development has also significantly influenced lifestyles and cultures, leading to a loss of diversity in the face of homogeneous values. This context is also a factor in the uniform spread of coronavirus infection, once the virus made itself known.

### **3. Relations between humans and nature (I): Satoyama culture**

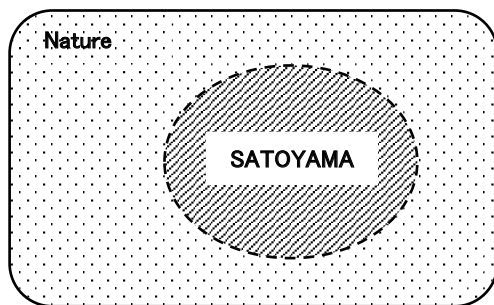
The previous section discussed the status quo of the coronavirus from the perspective of the relations between humans and nature; how have humans related to nature to begin with? Below, we shall consider satoyama culture, one example of this<sup>3</sup>.

“Satoyama,” a part of the essential scenery of Japanese mountain villages, refers to nature amended by human hands, in which the ecosystem’s balance within nature is maintained and human lives blend into nature as well. It also evokes humanity in coexistence with nature.

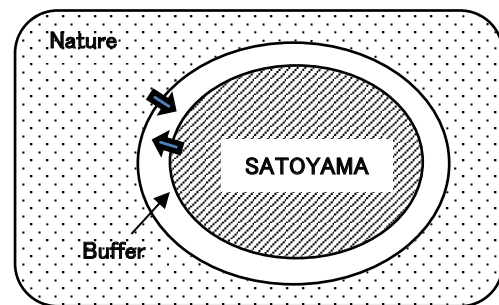
One of Japan’s best-known fairy tales is the story of Momotaro (Peach Boy). It begins “One day, the old man went into the hills to cut grass, and the old woman went to the river to wash clothes.” “Going into the hills to cut grass” refers to scything grass and withered branches among the mountainside trees: the old man is caring for the

trees on the mountain. The clear water which flows from these well-cared-for mountains allows the old woman to wash clothes and clean rice in the river. This is truly a depiction of the primeval context of life adjacent to nature, life integrated with nature. This is the context at the root of “satoyama.”

Incidentally, how is the relation between humans and nature maintained in satoyama areas? If humans and nature coexist, or are integrated, in satoyama, then the boundaries between the human organism and nature are fuzzy, or else there are no boundaries (Fig. 1A). However, even in an absence of boundaries, continuous coexistence with nature means that humans do not encroach excessively upon nature or exploit natural resources. That is, humans care for nature, thus gaining resources such as grass or fallen branches, but do not invade it to the point of tearing trees out by the roots. In short, the balance between the two is maintained.



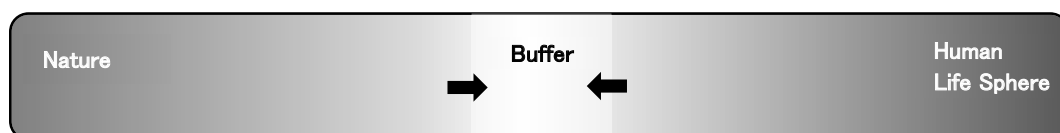
**Fig. 1A Relation between Human Life and Nature (I)**



**Fig. 1B Relation between Human Life and Nature (II)**

Let us consider this relation from another perspective. In satoyama, humans respect nature and cherish its continued existence; this is why they live at a given distance from nature. Conversely, this distance protects humans from natural disturbances. In other words, there is a tacit buffer between humans and nature, which mitigates the effects of natural disturbances (Fig. 1B). This buffer reduces the vulnerability of the human organism exposed to nature. The other way around, humans live in accordance with an unwritten rule against crossing this buffer into nature.

This relationship between human and nature is not limited to satoyama areas. Humans live in part of the immense vastness of nature. As well, nature possesses interior areas which humans cannot approach. From this perspective, it makes sense to assume that a given distance exists between humans and nature (Fig. 2). The distance kept between the human organism and nature is the buffer mentioned above.



**Fig. 2 Structure of the Relationship between Human Life Sphere and Nature**

This is just one conceptualization, of course, and this kind of region does not actually exist in reality. However, it provides a schematic idea of sorts for considering the relationship between humans and nature.

One example is the “planetary boundary” proposed by Johan Rockström<sup>4</sup>. This is an analysis of the effects of human activity on nature throughout the earth, based on nine processes, examining the threshold values of each for

irreversible effects of human activity on the earth. Of these nine processes, climate change due to global warming has already exceeded these limit values, the rate of biodiversity loss is soaring, and the maintenance of this biodiversity has reached critical status. All these problems are directly caused by human behavior. That is, they are the results of humans armed with science and technology, who have invaded nature or exploited its resources. When this behavior goes too far, nature's capacity is exceeded, and it can never return to what it was.

If we describe this situation with Fig. 2 above, the boundary point is within the buffer. If humans approach nature too closely as a result of their own behavior, they encroach on nature. Conversely, in such a case, a larger contact surface of the human organism is exposed to nature, increasing its vulnerability. Therefore, natural disturbances are more likely to become natural disasters from the human perspective. That is, correctly judging this buffer supports the sustainability of nature and the human organism.

#### **4. Relations between humans and nature (II): From the perspective of eQOL (environment-related QOL)**

The previous section examined satoyama areas in the discussion of the relations between humans and nature. Important here is the maintenance of the relationship of coexistence. With regard to this issue, this study has introduced and examined the concept of eQOL (environment-related quality of life) (Hirano & Nakashima, 2017, 2018)<sup>5</sup>. QOL is an indicator of human satisfaction with life and its quality<sup>6</sup>. Therefore, even if the “QOL of the entire human race” can be expressed as a concept, QOL is essentially related to the individual. In contrast, in modern times when the future and continued existence of humanity on a global scale are now up for discussion, eQOL has been introduced as an indicator for the examination of the sustainability of both humans and nature. That is, this concept is used with a view to balancing the fullness of human life and the maintenance of the natural environment, based on the awareness that the continued existence of human civilization is underpinned by the sustainability of the earth.

Certainly, the natural environment is diverse and complex from a human perspective. Nature became a physical target for humans when Christianity and Western philosophy expressed it as an object in opposition to humanity. Nature was a resource for human life and the target of cultivation; therefore, it could also be a threat. However, to put it more radically, the stance that humans are also a part of nature is valid as well. When we consider the current status quo, in which human activity harms nature and humans receive the backlash thereby, the issue of how humans are to coexist with nature is already important, and eQOL is one perspective from which to consider this.

As QOL indicates the satisfaction of a given individual with their life, eQOL is likewise related to human satisfaction. In the latter case, humans find value and satisfaction in the balance of the fullness of their lives with the continued existence of the natural environment. To this end, items such as those below must be set.

- [1] Improvement of values consciousness toward the physical state of nature
- [2] Improvement of values consciousness toward human spiritual satisfaction with nature
- [3] Mitigation of natural threats against humans (disaster prevention/mitigation)
- [4] Improvement of the social value of nature for humans

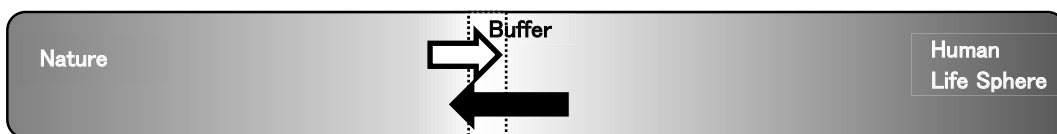
Here, [1] means the maintenance of nature in its original state as a rule, but also includes the maintenance of the coexistent sustainability of humans with nature, as in satoyama areas. [2] depends basically on individuals' values

consciousness of nature, which must be shared within society. As well, [3] refers to humans protecting themselves from natural disasters. However, the temporary use of science and technology will not lead to permanent coexistence with nature. [4], finally, will lead to the maintenance of nature in coexistence with humans, which in turn will increase the satisfaction of humans themselves.

Most important for the construction and maintenance of an eQOL environment is awareness of the coexistence of humans with nature. In order to attain this, we must consider carefully how humans make contact with nature: the problems of “excess contact” and “excess encroachment.” The example of satoyama previously evinced is one possible solution.

In the Momotaro story, when “the old man went into the hills to cut grass, and the old woman went to the river to wash clothes,” we see an exchange between humans and nature. Cutting grass in the mountains is the maintenance of nature, based in respect and awe of nature in the form of mountains. Its blessing takes the form of the flow of clear water which returns to humans. The old man does not make any further inroads into nature. The space here called a buffer symbolizes this relationship of mutual dependence between nature and humans. Conversely, if the old couple’s house were to be fitted with electricity and gas, the old man would no longer go into the mountains; abandoned, the nature of the mountains would run wild. Or if he were to start cutting down the trees on the mountain and selling their lumber in town, the forests might be reduced to bare mountains. The buffer in Fig. 2 expresses this kind of coexistence between humans and nature. Humans’ awareness of respect for nature, including nature’s blessings, is equivalent to [1] and [2] above. As well, nature’s threats can be mitigated through avoiding excess contact ([3]). Living within nature in this way will confer peace and stability on the human spirit ([2] and [4]). In short, eQOL can be ensured here.

Conversely, let us consider a region where the tropical rainforest has been felled for economic reasons, with the land planted with rubber trees. The rainforest is in itself a diverse complex of plants, which has thus preserved an autonomous sustainability. However, the same does not apply to the uniform planting of rubber trees. The rubber forest, with grasses trimmed precisely away, cannot maintain its own natural environment. It must be watered depending on the amount of rainfall, and may need fertilizer as well. That is, artificial care is required. However, floods or droughts might also impose serious damage. The artificially planted rubber tree forest has increased exposure to nature and thus increased vulnerability, to the extent that it encroaches upon nature. Therefore, it is severely influenced by natural disturbances, in terms of the effect on the rubber harvest as well. Of course, this is an extreme example. The rubber tree forest is a part of human economic activity intended to obtain rubber. If it encroaches too far on nature, humans will be reducing their own buffer—or eradicating it by crossing it—and coming that much closer to nature (Fig. 3).



**Fig. 3 Reduction or Extinction of “Buffer” Field by Human Activities**

This is not intended as a rejection of human economic activity in the form of planting a uniform rubber tree forest. It is natural for humans to use nature to their own benefit. What is important is their awareness of how that

activity affects their relationship with nature. The concept of eQOL is closely related to this point. When humans destroy nature for the sake of development, they are inevitably encroaching on nature. However, considering nature’s capacity and keeping the encroachment to a measured degree enables the impact of humans on nature to remain within a mild range. This includes the awareness of the buffer, and can lead to the improvement of eQOL.

To measure eQOL, we must examine both the degree of encroachment on nature and the satisfaction of humans themselves. However, like QOL, eQOL cannot be easily expressed quantitatively. It is important here that humans respect nature and maintain an awareness of coexistence with nature.

## 5. The Covid-19 pandemic and eQOL

2020 saw worldwide disruption due to the Covid-19 pandemic, which has continued into 2021. As noted in section 2, this is a biohazard of sorts and, in terms of the relationship of nature with human society, an environmental hazard. From the perspective of human activity, the major factors causing this pandemic include humans’ excess contact with nature and the global society.

Here, let us take a somewhat extreme view of the relationship between humans and nature. As noted in section 3, satoyama areas represent a gentle form of human contact with nature (Fig. 4A). In contrast, what image does the urban society, heavily concreted and lined with tall buildings, represent? In satoyama, a buffer (a given distance) exists between humans and nature. However, in the urban society, nature is in some ways forcibly encroached upon in order to build a town. Even the artificial nature such as parks which may be included therein are not true nature. Rather, the city minimizes its buffer so as to negotiate with nature in the outside world. This means that the urban society exposes itself to nature, and this increases its vulnerability. Conversely, natural elements may also take a negative turn, such as the heat island phenomenon unique to cities, or locally strong winds around high buildings (Fig. 4B).

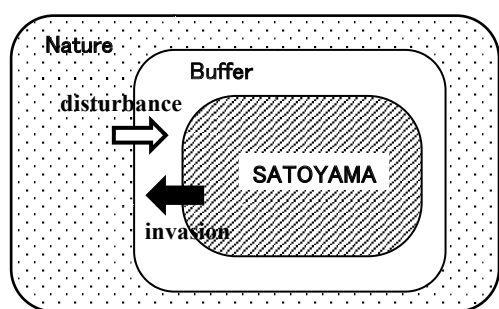


Fig. 4A Structure of Relation between Human Life and Nature (Satoyama)

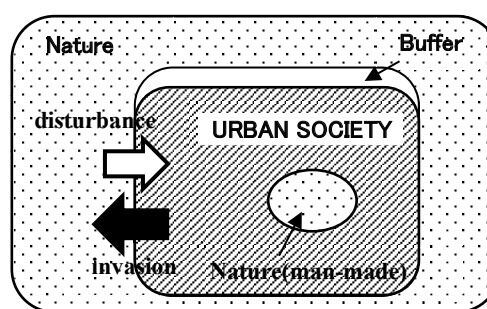
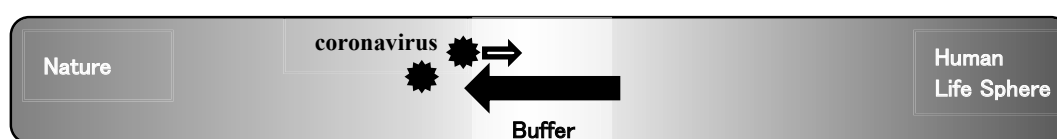


Fig. 4B Structure of Relation between Human Life and Nature (Urban Society)

Using the urban society as a model in this way is not in order to reject its existence but to analyze and consider its relationship with nature. In modern civilization, in fact, humans use science and technology to pursue comfort in their own lives, creating infrastructure for lifestyle convenience such as residences, transport, education, medicine, leisure facilities, and so on. The result of this is that houses are built on mountainsides near cities as well, dams are constructed to supply cities with water, and high-rise buildings are erected on filled-in land. Humans are actually forcing nature aside to create their own space for activity. This indicates an excessive approach to or contact with nature. No buffer maintaining a distance from nature can exist there, and even if it did it would be minuscule. While human QOL appears at a glance to be improved in this context, the same does not necessarily apply to eQOL. If

anything, it is seriously affected by climate changes such as global warming and acid rain as well as floods due to decreased water retention capacity in the mountains.

In fact, the current Covid-19 pandemic can also, in a sense, be said to derive from excess human contact with nature. We do not know what the source animal originally carrying the coronavirus was—whether or not it was a bat of some kind—but it had to have existed within nature. Humans may have approached this source animal, or something else again, by accident. It is clear that recent human activity involves invasion of the original “natural region.” Concerns arise such as whether humans have come too close to nature out of their own desires and will, and whether they have been in too close contact with animals (Fig. 5). That is, one factor in the human encounter with the coronavirus may be that humans have made contact with nature while forgetting, or ignoring, the given distance to be kept.



**Fig.5 Human Activities beyond “Buffer Field”**

From the perspective of this paper’s model, this means that humans have progressed beyond the buffer existing between themselves and nature. At the same time, it shows that humans have lost their sense of respect and awe for nature. This is where this paper’s topic of eQOL comes in. The issue of the environment is by no means an individual one. The subject which finds the nature in view beautiful, considers it soothing, and treasures it is the individual. However, when this awareness of nature as an essential environment with regard to human society is expanded from the individual to the multitudes, it is significant to consider eQOL when developing it into a further shared awareness. Conversely, when human society goes past the buffer existing between humans and nature, it can be considered the result of failing to take eQOL seriously enough. The world is now frantically putting every aspect of science and technology at work in order to develop a vaccine for the Covid-19 pandemic. We can only hope for good results at this point, but must not forget that at the root of this issue is the problem of the relationship of humans and nature, in that sense the problem of eQOL.

## **6. In lieu of a conclusion: The possibility of new threats**

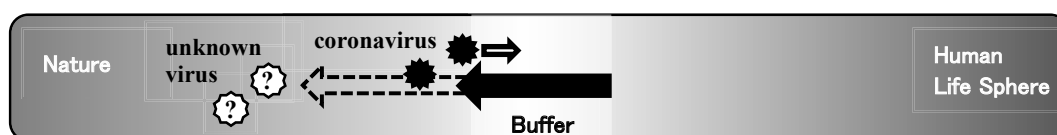
While vaccination for the rampaging Covid-19 has finally begun, humanity has still managed no more than preventative measures or basic symptomatic treatment. In the end, the everyday normal has not returned to lives around the world.

This paper has discussed Covid-19 as an environmental hazard, in particular from the perspective of the relation between humans and nature: the perspective of why a virus originally extant in nature was brought into human society. One of its factors is the excess contact with nature caused by human activity in search of our own comfort. Another is the world-scale globalization taking place. This is related to the first factor in terms of closely adjacent regions and the loss of diversity, but must remain here a topic for discussion in the future.

The Covid-19 infection was derived from a coronavirus in the natural world. While we have acquired some information on this virus, this is probably humans’ first experience with it, and its details remain unknown.

Incidentally, how much of the natural world is still beyond humans' ken? It is, perhaps, these unknowns that appear due to excess contact with nature on the part of humans.

An interesting report has appeared with regard to this point. In its 2016 news, AFP (L'Agence France-Presse) reported that the permafrost in Russia's Yamal Peninsula was melting and that an anthrax infection had spread from the carcass of a reindeer found therein<sup>7</sup>. Other similar examples have also come up. The American researcher Nicholas Parazoo and his group<sup>8</sup> have pointed out that when the frozen soil called permafrost melts, it releases large amounts of carbon compounds. At the same time, concerns have been expressed that the permafrost will generate a range of viruses, including those unknown to humans. The melting of the permafrost is due to global warming; as humans push global warming further, greenhouse gases will be increasingly emitted. Unknown viruses are an even greater threat. This is another example brought about by humans' invasion of nature—their contact with nature beyond the buffer—which has, in the end, constituted a threat to humans (Fig. 6).



**Fig.6 Possibility of the Existence of an Unknown Factor to Humans**

This paper has described a conceptual “buffer” existing between humans and nature as one way to avoid excess contact of the former with the latter. At the same time, it has applied the concept of eQOL as an indicator for human respect for the natural environment and maintenance of mutual sustainability. In the end, human maintenance of the buffer's existence and contact on that premise with nature will lead to heightened eQOL. This perspective may be of help in reconsidering the Covid-19 pandemic created by the coronavirus as well.

This paper has also cited worldwide globalization as another factor in the Covid-19 pandemic. This is also related to the first factor in terms of the close adjacency between regions and the loss of diversity, and requires further consideration. This paper has also treated nature as a single overall object; however, the nature with which humans are faced includes primitive aspects as well as those integral to human activities. For example, the problem of food includes farmed marine products and livestock animals. These fall within the range of human intervention with nature. Alternatively, take the problem of avian influenza, which has not yet come completely under human control. Further, nature itself includes inorganic nature grasped as chemical substances as well as organic nature created by biological organisms. How are humans to address these various forms of nature, and how do they influence us? These issues also require further examination.

The Covid-19 pandemic has forced a shift in daily life on us willy-nilly, from the “normal” to the “new normal,” or life restricted by the coronavirus. At the same time, humans are called on to discover a “new normal” as the result of a reconsideration of our relationship with nature.

**Notes**

<sup>1</sup> Generally, the negative effects of various environmental factors on humans and other living things are called environmental risks, while harmful environmental factors are called environmental hazards.  
<sup>2</sup> Ministry of the Environment, *Brochure: Ecosystem-based Disaster Risk Reduction in Japan - a handbook for practitioners-*, edited and published: Nature Conservation Bureau, 2016.



<https://www.env.go.jp/nature/biodic/eco-drr/pamph04.pdf>

- <sup>3</sup> Cf. Homepage: The International Partnership for the Satoyama Initiative (IPSI).  
<https://satoyama-initiative.org/>
- <sup>4</sup> Rockström, J. et al., “A safe operating space for humanities”, *Nature*, 461(24), 2009, pp. 472-475.
- <sup>5</sup> Hirano, Y., and T. Nakashima, “The Core Project Research Report: An Essay on the Introduction of Environment-Related QOL”, *Civilization*, Institute of Civilization Research, Tokai University, No.22, 2017, pp.35-44 (in Japanese).  
Nakashima, T., and Y. Hirano, “The Relation Between Human Activities and the Natural Environment: An Essay on the Introduction of Environment-Related QOL”, *Civilization*, Institute of Civilization Research, Tokai University, No.23 (Special Issue: Dialogue between Civilizations), 2018, pp.87-94 (in Japanese).
- <sup>6</sup> In the document (WHOQOL, 1997), the WHO has determined six domains for the evaluation of QOL, such as 1) Physical health, 2) Psychological health, 3) Level of Independence, 4) Social relationship, 5) Environment and 6) Spirituality/Religion/Personal beliefs.  
Cf. WHOQOL, (1997), Measuring Quality of Life, [http://www.who.int/mental\\_health/media/68.pdf](http://www.who.int/mental_health/media/68.pdf).
- <sup>7</sup> AFP (Russia), August 11, 2016 “Scientists warn anthrax just one threat as Russian permafrost melts.”  
Cf. <https://www.abc.net.au/news/2016-08-11/scientists-warn-anthrax-just-one-threat-as-russian-permafrost-m/7720362s>
- <sup>8</sup> Nicholas C. Parazoo et al., “Detecting the permafrost carbon feedback: Talik formation and increased cold-season respiration as precursors to sink-to-source transitions”, *Cryosphere*, 12, 2018, pp. 123–144.