

THE FEATURES OF INDICATOR OF THE ENVIRONMENT-RELATED QOL (QUALITY OF LIFE)

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ABSTRACT. *The sustainability of our planet is payed attention to live with the same way in civilized world. Environmental problems affected by the science and technology caused global warming, flooding and natural disaster. The factor of “environment” should be considered to live with well-being. In this paper, we will combine the concept of QOL (Quality of Life) and environment, and propose the new index of environment-related QOL (e-QOL). The QOL parameters meaning the well-being in one’s life are extracted of the model of Hygge, and evaluate the related words used in SNS. Finally, we propose the indicators of e-QOL as the results of experiments. These results show the Japanese people’s way of thinking for well-being and the importance for environment.*

Keywords: QOL, Environment, Indicator, SNS

1. **Introduction.** The current civilization developed by the science and technology generated the environmental problems such as global warming, which climate change will produce drought or floods accompanying heavy rain. This current earth has been changed to the new epoch called the Anthropocene influencing the human on Earth’s geology and ecosystem. The Anthropocene was widely popularized in 2000 by atmospheric chemist Paul J. Crutzen [1], who regards the influence of human behavior on Earth’s atmosphere in recent centuries as so significant as to constitute a new geological epoch. The United Nations and many scientists and individuals are pushing toward removing dangerous tipping points. It is now indisputable that the planet and people’s needs are interconnected and need to be addressed. The United Nations has created 17 Sustainable Development Goals (SDG) and 169 targets in 2015. The civilization and environment are tightly connected each other and the approach for the climate change, climate action is the number 13 in SDG’s, and should be taken in the global level. In these days, a lot of earthquake, typhoon damaged country side in Japan. These damages caused the economic loss and loss of life space. In this civilization, we should not only consider the natural environment confronting our life, but also the new comfortable life supported by the science and technology. This discussion finally aims to solve the problem of the global sustainability. On the other hand, QOL (Quality of Life) is taken attention to worldwide in health care field. Roots of the term “quality of life” in health care can be traced back to the definition of health by the World Health Organization in 1948. The enhanced concept of QOL should be the realization of “well-being” for human life and the establishment of sustainable world. The difference of political and economic policy in each country, however, could not behave together to realize the same goals. In this paper, we will evaluate the QOL indicators in EU, and choose the concept of Hygge in Denmark as the happiness indicator, and then will propose environment-related QOL (e-QOL) indicators. We will finally show

the experimental results conducted to gather the QOL information using Google service and Twitter API. These experimental results could be unique in Japan compared to the concept of Hygge.

2. Related Researches. [2] proposed the environmental indicators for the assessment of quality of life. They defined the environmental dimension is one of the major influences on quality of life and assessed to apply the following groups of indicators: environmental quality, environmentally responsible behavior and consumption of environmental services. This research, however, focused on natural environment resources, such as carbon dioxide, fresh water, and evaluated based on the economic indicators. We want to discuss the more human feeling for well-being than social economic indicators. [3] examined the relationship between the free time allocation with the perceived Quality of Life (QOL) and the satisfaction with life in Greece. They classified the categories into physical or mental health and it is time allocation and leisure and allocated the calculation functions for each category. The questionnaires are applied to gathering the feeling and information. These quantitatively measured values, however, are limited and depending on the selected persons.

3. Concept of QOL and Well-Being.

3.1. Definition of QOL in WHO and EU. QOL is known to express one's life satisfaction meaning that the quality of human existence and life with well-being. The Constitution of the World Health Organization (WHO) defines health as "A state of complete physical, mental, and social well-being not merely the absence of disease...". It follows that the measurement of health and the effects of health care must include not only an indication of changes in the frequency and severity of diseases but also an estimation of well being and this can be assessed by measuring the improvement in the quality of life related to health care [4]. WHO has developed two instruments for measuring quality of life: WHOQOL-100 and WHOQOL-BREF. In these documents, 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. The domain of "Environment" is explained that the environment surrounding the personal life influences personal physical and mental conditions. The facets incorporated within "Environment" domain include "participation in and opportunities for recreation" and "physical environment, such as pollution/noise/traffic/climate". These elements show that QOL should be described within the relation of natural environment and human activates over the natural environment.

The European Union established the statistical office called Eurostat in Luxembourg (LU). Eurostat publishes official statistics on the European Union and the euro area, offering a comparable, reliable and objective portrayal of Europe's society and economy. The publication [5] presents a detailed analysis of 8 + 1 dimensions which can be measured statistically to represent the different complementary aspects of quality of life, complementing the indicator traditionally used as the measure of economic and social development, Gross Domestic Product (GDP). We should require the new metrics beyond GDP. GDP is very useful for measuring market production. It would be said if GDP is increased today, the natural resources will be depleted for tomorrow. The 8+1 dimensions of quality of life are defined as follows: 1) Material living conditions (income, consumption and material conditions), 2) Productive or main activity, 3) Health, 4) Education, 5) Leisure and social interactions, 6) Economic and physical safety, 7) Governance and basic rights, 8) Natural and living environment and Overall experience of life. In this definition, the environment element has been included and should be evaluated in detail. The Earth's activity sometimes causes the huge damages especially in Japan. We should consider the collaboration between human life and Earth's environment to maintain the

global sustainability. To establish this collaboration, we consider the following two points. 1) Humans seek to maintain their livelihoods, i.e., civilization, and seek satisfaction in their lives. 2) Humans need to conserve and maintain the natural environment. We should be conscious for natural environment should be connected to the happiness.

3.2. Social concept of happiness in Denmark. In 1971, Denmark firstly established the Ministry of the Environment in the world after that the name was changed to the Ministry for Pollution Control in 1973 and now changed to the Ministry of Environment and Food [6]. In addition, Denmark has got the most honored award, Gift to the Earth Award, from the WWF (World Wildlife of Fund) in 2013, and was evaluated most kind country for climate change by the CCPI (Climate Change Performance Indexes) in these years. These facts have a symbolic significance that Denmark has been focusing on the environmental problem for a long time. On the other hand, Denmark was positioned on top level for happiness in different research.

We decided to select the best sample of Denmark’s Hygge representing words as the typical happiness keywords. Table 1 shows the one example to represent Hygge words [7].

TABLE 1. The manifest of Hygge: concept of happiness in Denmark [7]

Atmosphere: Turn down the lights
Presence: Be here now. Turn off the phones
Pleasure: Coffee, chocolate, cookies, cakes, candy
Equality: ‘We’ over ‘me’. Share the tasks and the airtime
Gratitude: Take it in. This might be as good as it gets
Harmony: It is not a competition. We already like you. There is no need to brag about your achievements
Comfort: Get comfy. Take a break. It is all about relaxation
Truce: No drama. Let us discuss politics another day
Togetherness: Build relationships and narratives. Do you remember the time we...?
Shelter: This is your tribe. This is a place of peace and security

3.3. Proposed e-QOL (environment-related QOL) and indicators. The organization of Eurostat shows the quality of life indicators – measuring quality of life [5]. The depleting resources and natural disaster are directly connected to the QOL. We select environment-related QOL indicators to discuss the trade-off between individual person’s well-being and global sustainability. We proposed the space-oriented e-QOL (environment-related QOL) [8] in Figure 1. The e-QOL was classified into four levels: individual level, local community level, society or country level and global level. The individual level is close concept of original QOL. This level has the indicators such as living conditions exposed to environment, healthy life under environment. The local community level has the indicators such as noise from neighbors, surrounding natural environment, disaster risk and happiness living in a community. The society or country level includes indicators such as migrants, greenhouse gas emissions, no-generating carbon dioxide, and happiness living in this country. The global level has the indicators in terms of natural and living environment such as pollution and global warming or greenhouse gas emissions. The concept of each level sometimes conflicts each other due to the different sense of value. We should discuss the relation between each level indicator because we think the total happiness is induced of the equal performance and role on each level. In this paper, we will focus on the relation between society level, meaning country level, and global level.

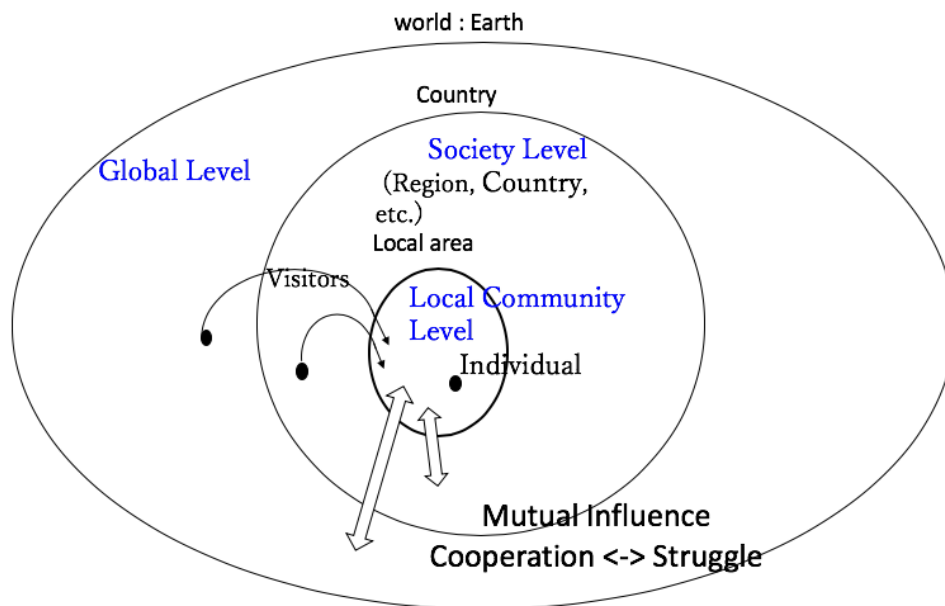


FIGURE 1. Our proposed environment-related QOL concept

4. Experimental Evaluation.

4.1. **Search results using Google alert.** To gather the consciousness about the keywords of “QOL” in Japanese people, we input this word in the Google alert [9], and gathered the information for two months: August and September in 2018. Google alert can collect the new contents related the designated keyword from the Web site all over the world. As the results of experiments, most of information were relevant to “Healthcare”, “Medical care”, and “Nursing care”. As other fields, “IoT”, “Smart city” and “Marriage promotion service” appeared a few times. These results show that the meaning of QOL is limited in the healthcare and medical care in Japan, and does not expand to comfortable life or emotional well-being.

4.2. **The specification of our proposed evaluation system.** To extract keywords representing happiness, we conducted the evaluation system. Our goal of this research is to make the same concept of both country level and global level in our proposal. We firstly gathered the tweets in Japanese as the country level data using Twitter API. Firstly, we used the keywords of Hygge, as the concept of happiness, and gathered the co-occurrence keywords. We will conduct to gather keywords in other languages in the future and compare the feature of happiness feeling.

4.3. **Co-occurrence words related to Hygge.** We conducted the experiments gathering the tweets information with co-occurrence of the Hygge keywords for one week. The total tweets are 67,247 lines for 10 keywords. We could get the following features. 1) Futon, cushioned mattresses to sleep in Japan, appears in “Pleasure” and “Gratitude” meaning that sleeping and rest is the big element in pleasure and gratitude. 2) The elements of “Gratitude” come from the event or festival. We suppose that people in Japan have no close gratitude such as for family or community. 3) “Harmony” is very restricted scene such as feeling of taste. In this sample, the different taste sweet generates the taste of harmony. 4) Co-occurring words of “Truce” and “Shelter” are related to the war in Japanese. In Japan, these words are rare to use in normal communication and social shelter or truce is merely commented in communication. 5) “Togetherness” is commented in the field of music live. We suppose the chance of togetherness such as the volunteer activity is not so popular in tweets community.

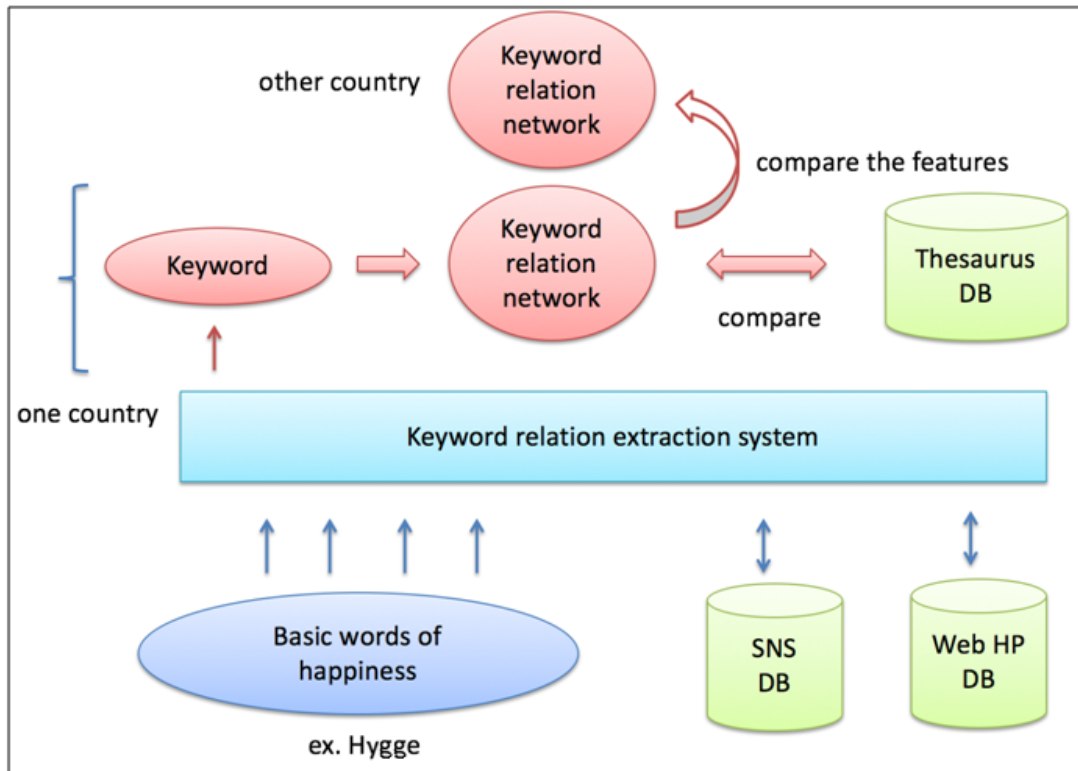


FIGURE 2. Evaluation system for the concept of e-QOL

TABLE 2. Frequently appearing tweets with Hygge’s keywords

Atmosphere: like, good, feeling, photograph, photo, hall, everybody, myself, happy, nice
Presence: myself, good, feeling, me, human, Japan, society, god, world, value
Pleasure: futon, me, earth, cotton, gratitude, mother, peace, sadness, lyrics, problem
Equality: human, men-and-women, woman, everybody, freedom, country, man, Japan, society, discrimination
Gratitude: anniversary, early, everybody, campaign, festival, futon, hold, character, max, win
Harmony: human, tomorrow, schedule, delicious, limit, marvelous, sweet, Kyoto, max, win
Comfort: car, Chinese character, space, comfortable, crown, room, life, train, vehicle, video
Truce: once, agreement, war, South Korea, consideration, Korea, army, me, self-defense force, necessity
Togetherness: hall, maximum, tour, precedent, performance, Yokohama, emotion, live, great, stage
Shelter: flight, America, school, army, sky, human, Futenma, place, children, government

5. **Conclusion.** When considering global sustainability in particular, people are required to maintain the natural environment while they seek rich lives. From each of our proposed premises, we will also discuss and examine the general concept of “environment-related QOL” for posing the question of how the environment ought to be for humans. We also examined the feeling in Japanese compared to the Hygge in Denmark, will conduct to gather information written in other languages and compare the features of culture.

REFERENCES

- [1] P. J. Crutzen and E. F. Stoermer, The Anthropocene, *The International Geosphere-Biosphere Programme (IGBP) News Letter*, no.41, 2000.
- [2] D. Streimikiene, Environmental indicators for the assessment of quality of life, *Intellectual Economics*, vol.9, pp.67-79, 2015.
- [3] D. I. Maditinos, D. Papadopoulos and L. Prats, The free time allocation and its relationship with the perceived Quality of Life (QoL) and Satisfaction with Life (SwL), *Procedia Economics and Finance*, vol.9, pp.519-532, 2014.
- [4] *WHOQOL Measuring Quality of Life*, http://www.who.int/mental_health/media/68.pdf, 1997.
- [5] European Statistics (Eurostat), *Quality of Life Indicators – Measuring Quality of Life*, http://ec.europa.eu/eurostat/statistics-explained/index.php/Quality_of_life_indicators_-_measuring_quality_of_life, 2015.
- [6] <https://en.mfvm.dk/the-ministry/>, 2018.
- [7] M. Wiking, *HYGGE – The Danish Way to Live Well*, Penguin Random House, 2016.
- [8] T. Nakashima and Y. Hiranom, The relation between human activities and the natural environment: An essay on the introduction of environment-related QOL, *Proc. of the 3rd Dialogue between Civilizations International Symposium*, pp.6-16, 2018.
- [9] *Google Alert*, <https://www.google.co.jp/alerts>, 2018.