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The Analysis of Results of Research into ‘the Ideal Society’ in Japan, Sweden and Bhutan -- Using the indicator of Human Satisfaction Measure (HSM)

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Abstract

The human satisfaction measures (HSM) as a sustainable social welfare indicator includes the triple bottom line (society, environment and economy) inevitable for Sustainable Development under six categories, namely, labour, health, education, gender, environment and income. HSM version 1-3 was developed by assigning equal weight to the indicators of the six categories. Considering interpersonal differences in the value to six categories, the author tried to calculate weighting coefficients using Analytic Hierarchy Process (AHP) methods. A web-based survey “The Questionnaire on Ideal Society” was conducted in Japan, 2007 (2109 samples collected) and Sweden, 2008 (300 samples collected). In addition in Bhutan, the author asked five experts to answer the questionnaire on her visit to Bhutan in 2007. Using the results of weighting coefficients of Japan, HSM ver.4 was developed, and from those of Sweden, HSM ver.5 was developed.

Introduction: progress of the study and its prospects

The Human Satisfaction Measure (HSM) includes the Triple Bottom Line (society, environment, and economy) that is necessary for HSM to be a sustainable development indicator, and was first developed by Ohashi (2000). Later, versions 1, 2-(1), 2-(2) (Ohashi, 2005) 3-(1), and 3-(2) (Ohashi and Nguyen, 2006) were further developed in collaboration with Hong Nguyen in 2005.

Until 2007, the six categories of HSM were calculated by assigning equal weights. However, considering interpersonal differences in valuing the six categories, the author, in collaboration with Nobuyuki Kimata, calculated weighting coefficients by adopting the Analytic Hierarchy Process (AHP) method. As a result, HSM version 4 was developed (Ohashi 2007, 2008). This version is based on a web-based survey “The Questionnaire on Ideal Society” conducted in Japan in 2007. Furthermore, this survey was also conducted in Sweden, which resulted in HSM version 5. In the latter part of this paper, the survey results from Japan, Sweden, and Bhutan are compared.

Observing the Consistency Index (C.I.) of the weighting coefficients of the six categories, the consistency in the Swedish data is significantly higher than that of Japanese data, which indicates that the survey questions were easy and clear for the Swedes. On the other hand, C.I. of the survey data of six categories in Japan was low, perhaps because the respondents had difficulty in answering the questions. Analyses of the mapping of words given to open-ended question using *True Teller* text mining software developed by Nomura Research Institute show that there are common key words appearing both in Japan and Sweden (consideration for environment, stabilization of life), and that there are key words that are characteristic in Japan (society without social gap and anxiety). On the other hand, those key words “democracy”, “education”, and “equality” appeared only in Sweden. In order to deepen the analyses of these answers, it seems necessary to conduct next step survey that can be utilized for policy implications for Japan.

1. What has been learned so far?

1.1 “Sustainable development” should be guaranteed to secure theories on wellbeing and satisfaction

The richness of ideal society can be indicated by satisfaction and wellbeing of the members of the society. However, the marketing

theories, sociology, and economics discuss only individual satisfaction (wellbeing), and to the author's knowledge, no thesis has discussed that sustainable development should be guaranteed for human satisfaction (wellbeing). For example, scholars of marketing define the purpose of marketing as "the availability of enough goods and services to consumer's expectations and needs" (Oliver, 1997, 13). But the author believes that the consumptions should not exceed the degree that allows sustainable development of the society. The conventional marketing theories are not linked with sustainability, except for the environmental marketing theories that are specified in environmental sustainability.

Although there are at least about 400 Japanese books (Shingu, H. 1998) discussing human wellbeing, no one has pointed out that sustainable development must be secured as a prerequisite for human wellbeing. In the thesis "Explaining Happiness", Richard A. Easterlin (2003) shows data, and explains that wellbeing is related to individual's life events (such as marriage, divorce, remarriage, bereavement, employment, and unemployment), individual's health, and individual's education. However, he does not mention the importance of the Triple Bottom Line (society, environment, and economy) that is closely related with sustainability of the society.

In "The role of human, social, built, and natural capital in explaining life satisfaction at the country level: Towards a National Well-being Index", Amanda W. Vemuri and Robert Costanza (2006) do not verify that four basic capitals (human, social, built, natural) underlie sustainable development of the society, and that sustainable development of the society is the prerequisite for human wellbeing.

However, both theses repudiate the economic theory that more income makes people happier. Vemuri and Costanza (2006) show that there is no correlation between the real GDP per capita and life satisfaction. Easterlin (2003) notes that allocating more time for

paid work to increase income slight non-monetary values such as family and health, and reduces wellbeing as a result. Regarding "Time Use and Balance", one of the nine indicators for GNH being developed in Bhutan, Karma Galay, of the Centre for Bhutan Studies stated in author's interview (August 10, 2007) that the people in Bhutan allocate more time for work for increasing income, which gives people less time to spend for their family. Therefore, an increasing income does not necessarily result in wellbeing (Galay, 2007).

1.2 Definition of sustainable development

There are a few hundreds of definitions of sustainable development (UNESCO, 2002), of which the author demonstrates two main points. The first one presented by the World Commission on Environment and Development (WCED) defines sustainable development as development that satisfies the needs of the present generation without harming the ability of the future generations to meet their own needs (WCED, 1987). This means that happiness and satisfaction of the present generation should not be intergenerational exploitation.

This way of thinking requires guarantee of environmental rights and rights to survival of future generations. In Germany, Chapter 20a of the constitution states that the State is responsible for the environmental rights of future generations (Ecosystem Conservation Society, 1996). The Chapter One of the Swedish "Instrument of Government" states that the public institutions must promote sustainable development in order to provide the present and future generations with good environment (Abe and Hata, 2005). Also the Swedish Environmental Code (Chapter One, 1999) aims to ensure that present and future generations will live a healthy life in a comfortable environment (Ohashi, 2007). The Constitution of Bhutan (Article Five) states that the nation's natural resources and environment are for the benefits of present and future generations (Constitution Drafting Committee, 2005).

The Constitution of Japan does not mention environmental rights, but the Fundamental Law of Environment (Chapter Three) states that the present and future generations must be able to enjoy the benefits from healthy and rich environment.

The second point of the definition of sustainable development presented by Barbier (1987) emphasizes the harmonization of ecological system (environment), economic system (economy), and social system (society) (Barbier, 1987). Similarly, Elkington (1997) wrote the Triple Bottom Line (society, environment, and economy) must be audited.

1.3 HSM is sustainable development indicator that adopts triple bottom line

HSM adopts the above-mentioned second point of sustainable development (harmonious balance of the Triple Bottom Line), and consists of six indicators in three categories that can be broadly collected in many countries (see Table 1).

Table 1: HSM adopting society, environment, and economy

Triple Bottom Line	
Society	Labour category: unemployment rate Health category: infant mortality rate Education category: primary school enrolment rate Gender category: female advancement rate to 4-year university
Environment	Environment category: Ver.1 popularization rate of water supply Ver. 2-1 CO ₂ emission Ver. 2-2 ecological footprint Ver. 3-1 CO ₂ emission Ver. 3-2 ecological footprint Ver. 4 ecological footprint Ver. 5 ecological footprint
Economy	6. Income category: Gini coefficient

HSM, as a sustainable indicator consisting of Triple Bottom Line, is superior to many other social indicators (see Table 2).

2. Version-up of HSM

2.1 Equation of HSM and the shift of environmental category variables

HSM selects six categories that are not included in GDP, and establishes as the sustainable social welfare indicators in the following equation:

$$\text{HSM} = W (\text{Labor, Health, Education, Gender, Environment, Income})$$

As shown in Table 1, six categories corresponding to the Triple Bottom Line are selected, and the data sources for the six categories consist of statistical fixed quantity data.

Table 2: Social indicators from the perception of sustainability

	GDP (Gross Domestic Product)	SEEA (Handbook of National Accounting: Integrated System of Environmental and Economic Accounting)	NNW (Net National Welfare)	ISEW (Index of Sustainable Economic Welfare) GPI (Genuine Progress Indicator)	HDI (Human Development Index)	GNH (Gross National Happiness)	HSM (Human Satisfaction Measure)	HPI (The Happy Planet Index)
Economy (Income)	○	○	○	○	○	○	○	×
Society	×	×	△	○	×	△	○	×
Labor	×	×	△	△	○	○	○	○
Health	×	×	×	×	○	○	○	×
Education	×	×	×	×	○	○	○	×
Gender	×	×	△	△	○	×	○	×
Other	-	-	○ Consumer durables service	○ Costs on traffic accidents	-	○ Good governance	-	○ Satisfaction
Environment	×	○	○	○	×	○	○	○
Sustainability	×	△	△	○	△	○	○	△
International comparison	○	Produce by country	×	△	○	Not known	○	○

Note: Whether "society" "environment" and "economy" are included

○: included; △: partly included; ×: not included

International comparison: ○: possible; △: partly possible; ×: impossible

The ecological footprint used for environment category is a conversion of ecological capacity, which is necessary for a human group to support itself and to absorb wastes into land area and

water area. The unit of the ecological footprint is gha (global hectare). The advantages of the ecological footprint are: (1) calculation of ecological footprint includes the CO₂ emission; and (2) if the data of the ecological footprint exceeds the environmental capacity, the services given by environment for human need decreases. Thus, from the perspective of a decrease in human satisfaction, the ecological footprint is well linked with HSM. In Japan, ecological environmental capacity is 0.8 gha, but the ecological footprint is 4.3 gha, which is 5.4 times as much as the ecological capacity.

2.2 Shift in the calculation method for HSM

The versions 1, 2-(1), and 2-(2) of HSM were calculated by the Cross Entropy method (Golan and Miller, 1996).

$$HSM_i = P_{o,j} \sum_{j=1}^6 \ln P_{o,j} - P_{o,j} \sum_{j=1}^6 \ln P_{i,j}$$

(Equation 1)

$P_{o,j}$: standard value of j category in every year

$P_{i,j}$: empirical data value of j category in every year

i : annual data j : every category

The versions 3-(1), 3-(2), 4, and 5 were calculated by the DtT (Distance to Target) method (Itsubo and Inaba, 2005). Although the Cross Entropy method is one of the useful methods, it has a disadvantage that the calculation method is highly complicated and too difficult for policy makers and ordinary citizens to use. The DtT method was developed in the 1990s so that policy makers can make objective and transparent decisions. The advantages of the DtT method are: (1) Calculation method is simple; (2) Scientific transparency is assured; and (3) It can show consistency between policy objectives and the reality. The calculation method measures the distance between the policy objective and the reality. The

United Nations assesses the DtT method as a preferable method (UN (2001). The following equation shows the calculation method of HSM by the DtT method adopted after version 3.

$$HSM = \sum_i \frac{1}{P_i^o} \times \frac{P_i}{P_i^o} \times C \text{ (Equation 2)}$$

P_i^o is policy objective value; P_i is present value

$1/P_i^o$ is a standardization to show relative effect of each category within HSM, and demonstrates focuses of policy makers

P_i/P_i^o shows assessment of the realization of policy objective value; C is constant

2.3 Value changes in 15 countries from HSM Ver. 1 to Ver. 4

The figures below show HSM value shifts in 15 countries from HSM Ver. 1 to Ver. 4 between 1990 and 2002.

Figure 1: HSM Ver. 1

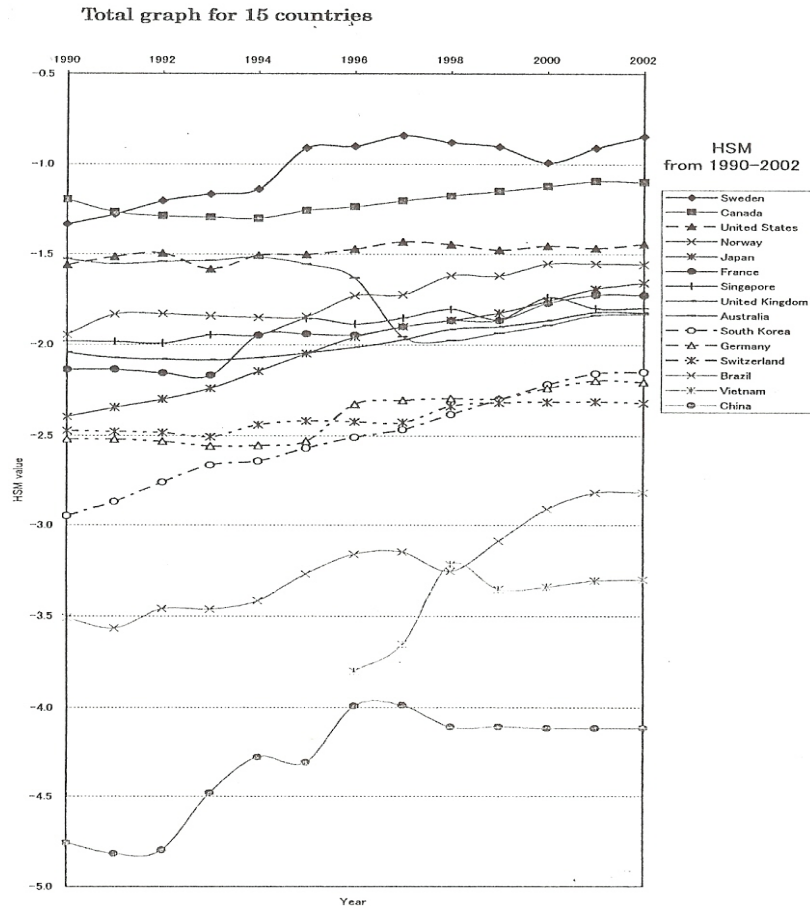


Figure 2: HSM Ver. 2-(1)

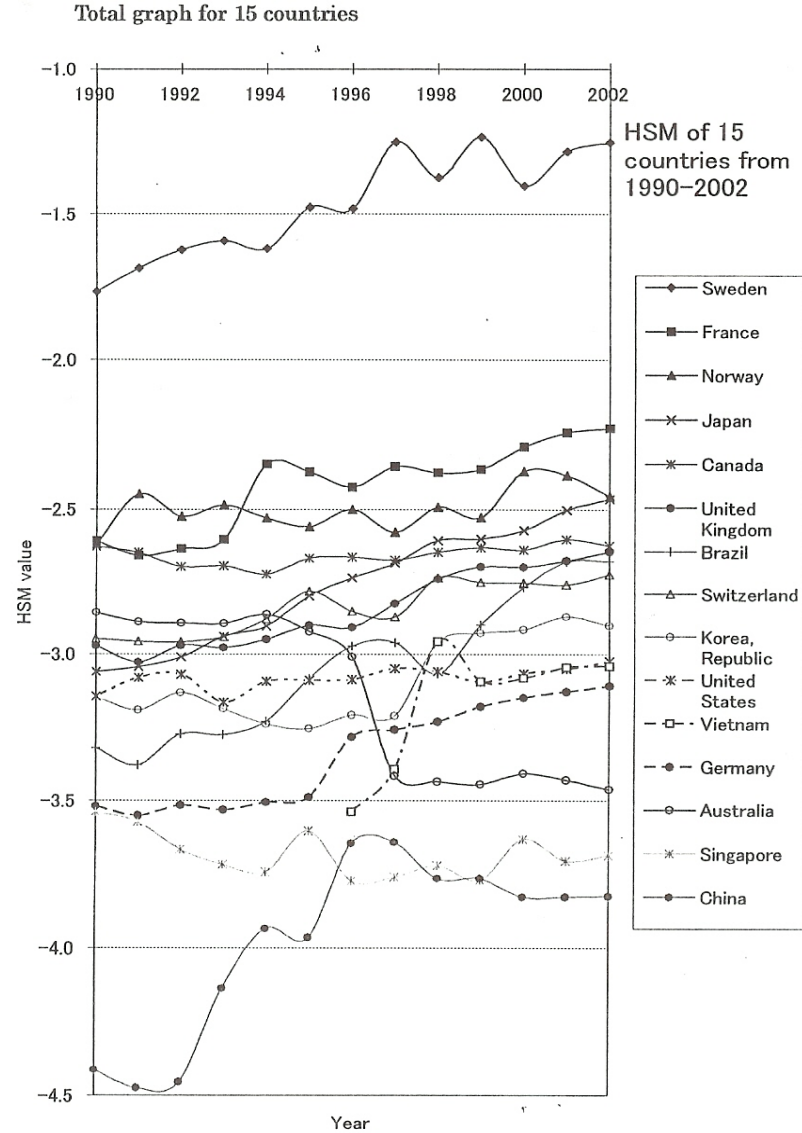


Figure 3: HSM Ver. 2-(2)

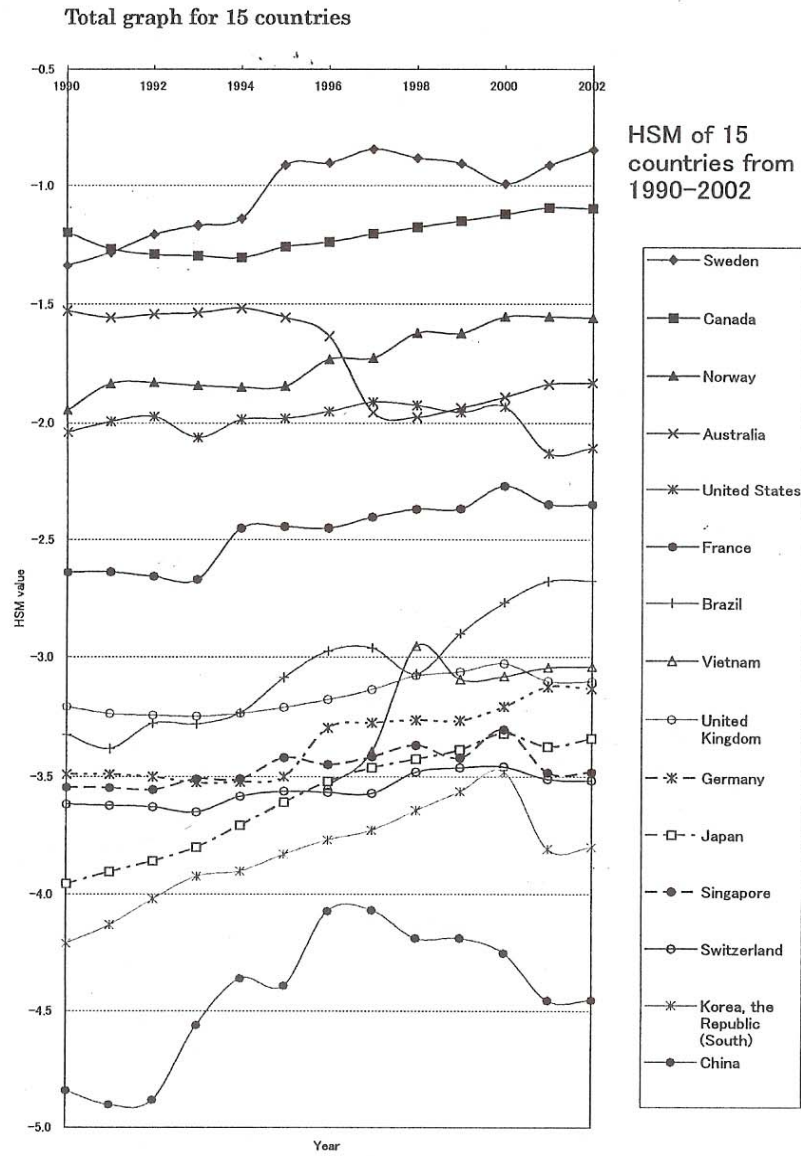


Figure 4: HSM Ver. 3-(1)

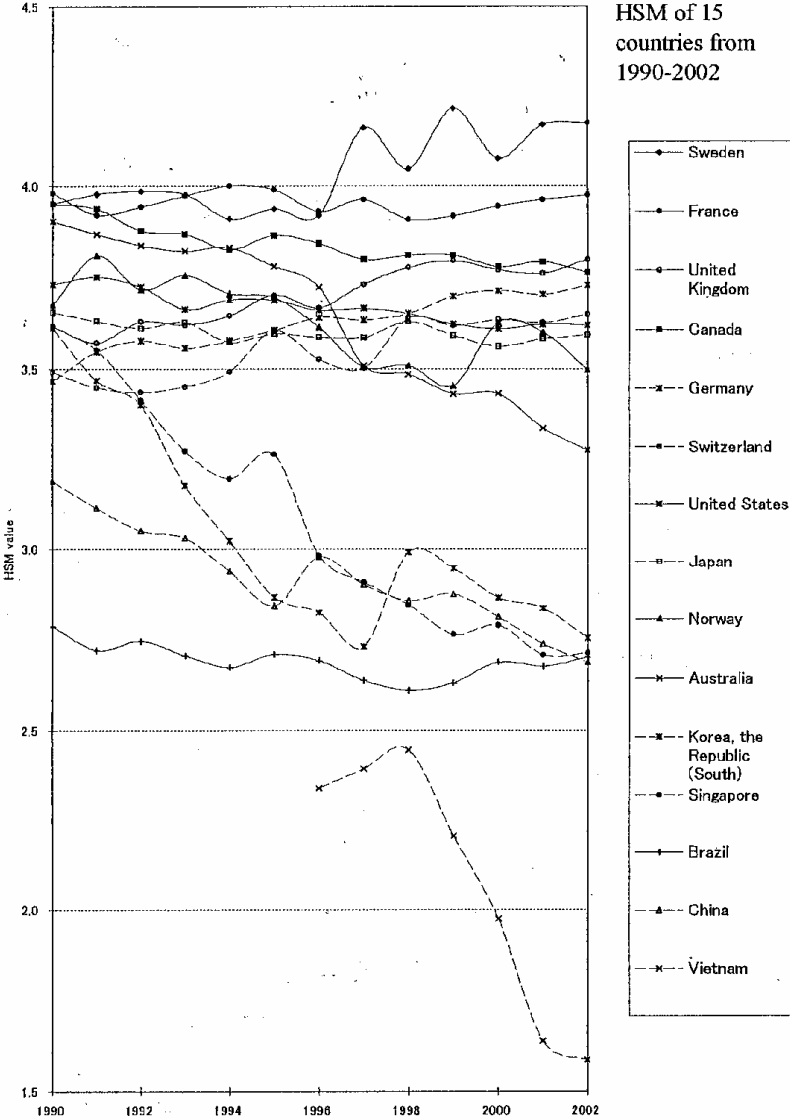


Figure 5: HSM Ver. 3-(2)

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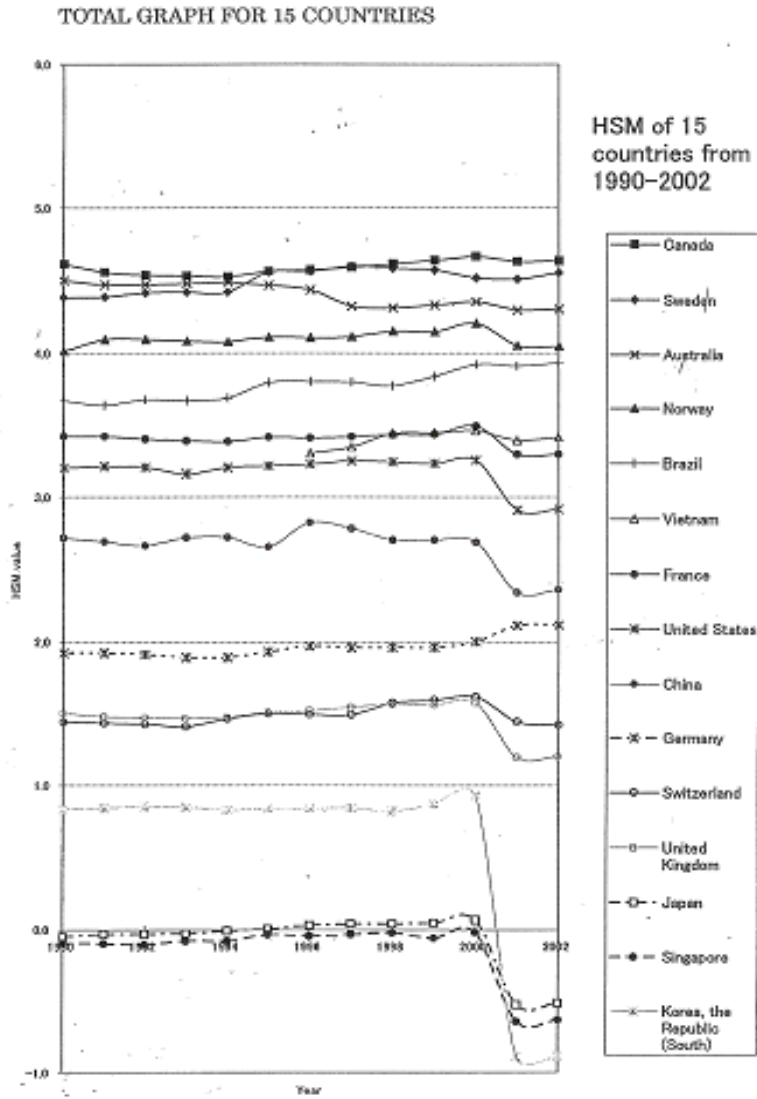
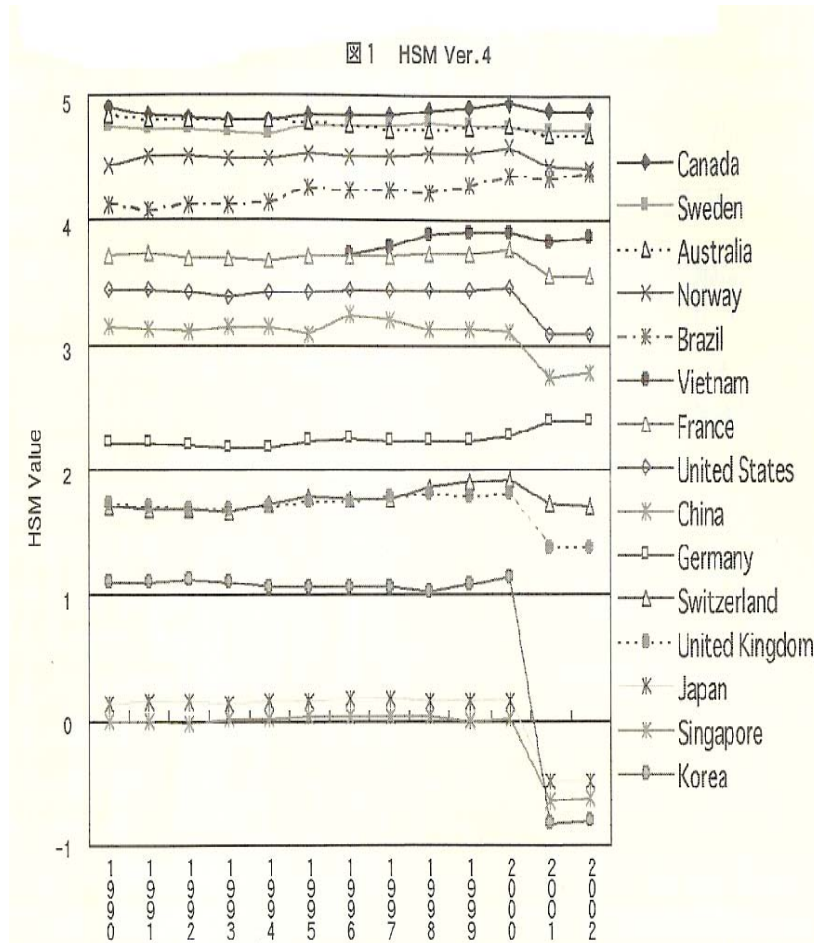


Figure 6: HSM Ver. 4



Since Japan's annual consumption per person is 5.4 times as much as the annual environmental capacity, the ecological footprint overshoots in Japan. Therefore, when the ecological footprint value is included in the environmental category, Japan's HSM ranking falls radically to the 13th place out of 15 countries.

3. Weighting coefficients of the six categories of HSM using the AHP method

3.1 Materialization of HSM and applying it to policy implications

HSM versions 1-3 calculated the composing six categories by assigning equal weight to them. However, considering interpersonal differences in attaching importance to the six categories depending on individual values and awareness, the Analytic Hierarchy Process (AHP) method was applied to calculate the weighting coefficients. First of all, in 2007, a web-based survey on ideal society was conducted in Japan. Then the weighting coefficients drawn from the survey data were adopted in HSM Ver. 3-(2), which resulted in HSM Ver. 4. Similarly, a web-based survey on ideal society was conducted in Sweden in 2008, and weighting coefficients drawn from the data were adopted in HSM Ver. 3-(2), which resulted in HSM Ver. 5.

3.2 The AHP method

The AHP method was refined by Professor T. L. Saaty of the University of Pittsburgh (Saaty, 1980) in 1970, and was applied to real social problems in 1973 (Warren, 2004). This is a method with multi-standards that has been utilized for most of practices in decision-making.

3.3 Method for calculating the weighting coefficients by using the AHP method

Abridged, see notes 4(b) (Page 124) -

4. Empirical methods and results in Japan, Sweden, and Bhutan

4.1 Web-based questionnaire in Japan

(1) Survey theme: Questionnaire on ideal society

The purpose is to find out how Japanese people value the six-category indicators

- (2) Respondents were asked to answer from global perspectives with consideration for sustainable development in both developing and developed countries, not only for Japan
- (3) The technical terms “ecological footprint” and “Gini coefficient” are explained when they are used
- (4) Survey methods
 - Questionnaire survey: conducted by Nikkei Research
 - Method: web-based survey; 6001 respondents selected by gender and age from five geographical blocks
 - Target group: between 20 and 69 of age
 - Time: from May 18 to May 23, 2007
 - Return rate: 2109 to the quantitative questions (with no invalid answers) (return rate 35.1%)
 - 1756 to the open-ended question F11
 - 948 to the open-ended question F12

4.2 Web-based questionnaire in Sweden

- (1) Survey theme: Questionnaire on ideal society in English
- (2) and (3) are the same as the case in Japan
- (4) Survey methods
 - Questionnaire survey: conducted by IID (Tokyo)
 - Method: web-based survey
 - Target group: between 20 and 69 of age
 - Time: from April 11 to April 22, 2008
 - Return rate: 300 to the quantitative questions (male 30 and female 30 in each age group)
 - 227 to the open-ended question Q20

4.3 Questionnaire answered by five experts in Bhutan

- (1) Survey theme: Questionnaire on ideal society
- (2) Questionnaire: the questionnaire used in Japan was translated into English
- (3) Time: from September to October, 2007

4.4 Consistency Index (C. I.) of the pair-wise comparisons

Consistency Index (C.I.) assesses the consistency in the evaluation values given in the pair-wise comparisons conducted in Japan, Sweden and Bhutan, and can be obtained by the following equation:

$$\text{C.I.} = \frac{\lambda_{\max} - n}{n - 1} \quad (\text{Equation 3})$$

λ_{\max} : maximum eigenvalue of pair-wise comparison

n : number of eigenvalue (6 in this case)

C. I. in the pair-wise comparisons of the six categories obtained from Japan is 0.092, which barely cleared the acceptable level of 0.1 or below. This may indicate that the pair-wise comparisons of the six categories were rather difficult for ordinary Japanese. C. I. in Bhutan was 0.098, which also barely cleared the acceptable level. There was a limitation of the survey by the small samples. On the other hand, C. I in Sweden was 0.005, which shows a much higher consistency compared with the results from Japan and Bhutan. It seems that the transparency and consistency in the Swedish society affect the C. I.

5. The weighting coefficients of the six categories in Japan, Sweden, and Bhutan

5.1 The weighting coefficients of the six categories in Japan

Table 3: Evaluated values and weighting coefficients

	C1	C2	C3	C4	C5	C6	G. Aver.	W_i (1)	W_i (6A)
C1	1	1.460	0.910	3.370	0.910	1.200	1.30	0.20	1.21
C2	0.685	1	1.160	3.180	1.220	1.300	1.26	0.20	1.18
C3	1.099	0.862	1	3.590	1.180	1.330	1.32	0.21	1.23
C4	0.297	0.314	0.279	1	0.380	0.430	0.40	0.06	0.38
C5	1.099	0.820	0.847	2.632	1	1.180	1.15	0.18	1.08
C6	0.833	0.769	0.752	2.326	0.847	1	0.99	0.15	0.92
Total							6.43	1.00	6.00

C. I.=0.092

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Notes: C1=reduction of unemployment rate; C2=reduction of infant mortality rate; C3=increase in the primary school enrollment rate; C4=increase in female advancement rate to 4-year university; C5=reduction of ecological footprint; C6=reduction of the Gini coefficient; G. Aver.=the geometric average; W_i (1)=weighting coefficients calculated by equation; and W_i (6A) = weighting coefficients calculated for this time.

As the table 3 shows, the increase in the primary school enrollment rate got the highest evaluation, and followed by the reduction of the unemployment rate, the reduction of the infant mortality rate, the reduction of the ecological footprint, the reduction of the Gini coefficient, and the lowest evaluation is the increase in female advancement rate to 4-year university.

5.2 The weighting coefficients of the six categories in Sweden

Table 4: Evaluated values and weighting coefficients

	C1	C2	C3	C4	C5	C6	G. Aver.	W_i (I)	W_i (6A)
C1	1	1.167	0.735	1.329	0.764	1.194	1.01	0.16	0.98
C2	0.857	1	0.870	1.627	1.017	1.528	1.11	0.18	1.08
C3	1.360	1.150	1	2.053	1.126	1.775	1.36	0.22	1.33
C4	0.752	0.615	0.487	1	0.664	1.132	0.74	0.12	0.73
C5	1.309	0.983	0.888	1.506	1	1.611	1.19	0.19	1.16
C6	0.838	0.655	0.563	0.883	0.621	1	0.74	0.12	0.73
Total							6.15	1.00	6.00

C. I.=0.005

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In Sweden, as in Japan, the increase in the primary school enrollment rate got the highest evaluation, but followed by the reduction of the ecological footprint, the reduction of the infant mortality rate, and the reduction of the unemployment rate. What is characteristic with Sweden is that the reduction of the Gini coefficient and the increase in the female advancement rate to 4-year university show the same value, which shows that gender equality is more advanced in Sweden than in Japan.

5.3 The weighting coefficients of the six categories in Bhutan

Table 5: Evaluated values and weighting coefficients

	C1	C2	C3	C4	C5	C6	G. Aver.	W_i (I)	W_i (6A)
C1	1	0.725	0.678	0.725	0.415	0.141	0.52	0.08	0.47
C2	1.380	1	1.070	1.000	0.525	0.644	0.89	0.13	0.80
C3	1.476	0.935	1	2.809	2.002	1.000	1.41	0.21	1.26
C4	1.380	1.000	0.356	1	0.644	0.158	0.61	0.09	0.54
C5	2.408	1.904	0.500	1.552	1	0.889	1.21	0.18	1.08
C6	7.114	1.552	1.000	6.325	1.125	1	2.07	0.31	1.85
Total							6.71	1.00	6.00

C. I.=0.098

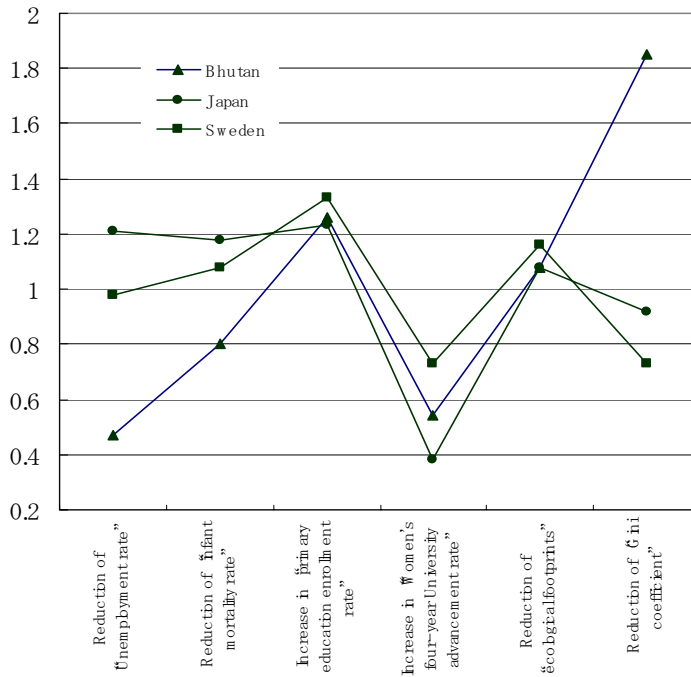
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In Bhutan, the country that has prioritized GNH over GNP for more than 30 years, the reduction of the Gini coefficient got the highest evaluation because of the dominant philosophy of equality deriving from Buddhism. And followed by the increase in the primary education enrollment rate, the reduction of the ecological footprint rate, reduction of the infant mortality rate, the increase in the female advancement rate to 4-year university, and the reduction of the unemployment rate got the lowest evaluation. The Bhutanese experts emphasized equality, and the increase in the female advancement rate to 4-year university showed higher rate than in Japan.

Weighting coefficients of the six categories in Japan, Sweden, and Bhutan

Although the three case countries show similar tendencies, what is eye-catching is that among the three countries, the evaluation on the increase in the female advancement rate to 4-year university is the highest in Sweden followed by Bhutan, and the lowest in Japan. As Gary S. Becker (1975) analyzes (Becker, (1975), the investment in higher education is reflected in employment and income, and affects social status and economic independence of people. In Japan, the fact that the evaluation on this category is the lowest is linked with the situation where the gap in social status and income between males and females are large, and shows the low consciousness of gender equality. That should be taken into consideration by Japanese policy makers.

Figure 7: Weighting coefficients of Japan, Sweden, and Bhutan



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Some social phenomena that exemplify the low gender equality in Japan are that among non-regular employment, female accounts for 54.2 percent, while male accounts for 18.6 percent (2008), and that the average income of females is 65.9 percent of that of males (2006), which show that the income gap between males and females is largest in Japan among developed countries. In addition, Gender Empowerment Measures (GEM) published by UNDP shows that Japan occupies the 54th place in the world, which means that the gender gap is largest in Japan among developed countries.

6. Calculation of HSM Ver. 5

6.1 Applying the AHP results to HSM Ver. 3-(2)

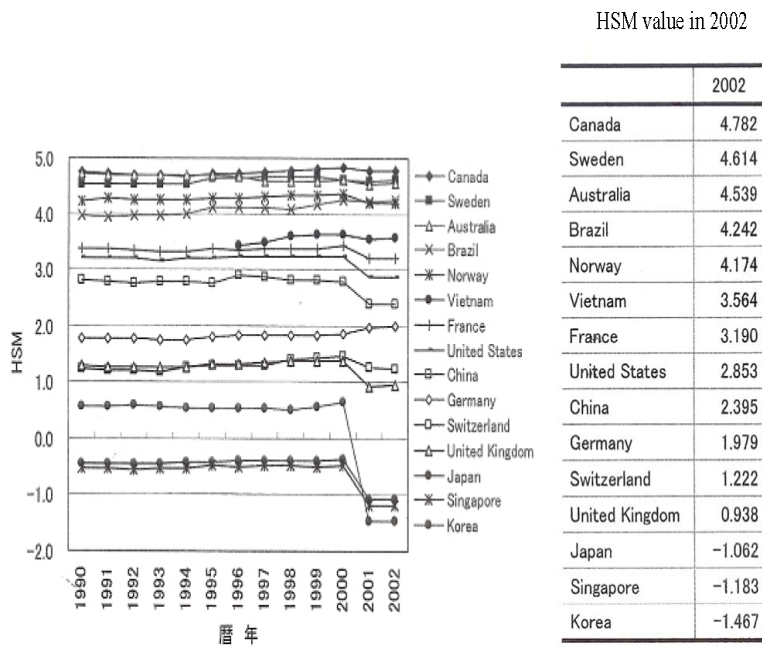
HSV, which is the weighting coefficients of the six categories obtained from Sweden ($W_1, W_2, W_3, W_4, W_5, W_6$) reflected in HSM Ver. 3-(2), was calculated by the following Equation 2, which resulted in HSM Ver. 5.

HSV = F(labor, health, education, gender, environment, income)

$$= W_1X_1 + W_2X_2 + W_3X_3 + W_4X_4 + W_5X_5 + W_6X_6 \quad (\text{Equation 4})$$

About X_1 to X_6 , see the note 4(b) (page. 125).

Figure 8: HSM Ver. 5 reflecting the weighting coefficients from Sweden



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7. Weighting coefficients of the Triple Bottom Line

7.1 Weighting coefficients of the Triple Bottom Line in Japan

Table 6: The weighting coefficients of the Triple Bottom Line in Japan

	Society	Environment	Economy	G. Aver.	W_i
Society	1.000	0.719	1.060	0.914	0.301
Environment	1.390	1.000	1.316	1.223	0.403
Economy	0.943	0.760	1.000	0.895	0.295
Total				3.032	1.000

C. I. =0.00071

The weight of the Triple Bottom Line was the strongest in "environment", followed by "society" and "economy"

7.2 The weighting coefficients of the Triple Bottom Line in Sweden

Table 7: The weighting coefficients of the Triple Bottom Line in Sweden

	Society	Environment	Economy	G. Aver.	W_i
Society	1.000	0.843	1.275	1.024	0.339
Environment	1.187	1.000	1.207	1.127	0.374
Economy	0.784	0.828	1.000	0.866	0.287
Total				3.018	1.000

C. I. =0.0028

In Sweden, like in Japan, the weight of the Triple Bottom Line was the strongest in "environment", followed by "society" and "economy". But weighting coefficient on economy is weaker, and on society is stronger than in Japan.

7.3 The weighting coefficients of the Triple Bottom Line in Bhutan

Table 8: The weighting coefficients of the Triple Bottom Line in Bhutan

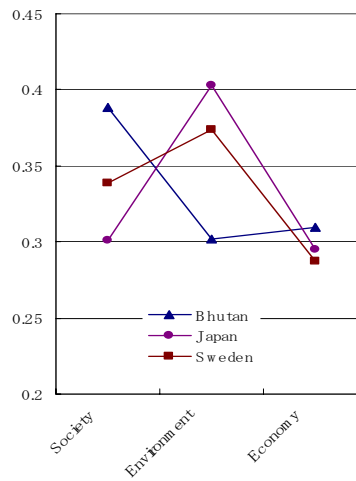
	Society	Environment	Economy	G. Aver.	W_i
Society	1.000	1.495	1.000	1.144	0.388
Environment	1.390	1.000	0.508	0.891	0.302
Economy	1.000	0.760	1.000	0.913	0.310
Total				2.947	1.000

C. I. =0.029

The weight of the Triple Bottom Line was the strongest in “society”, followed by “economy” and “environment”.

7.4 Weighting coefficients of the Triple Bottom Line in Japan, Sweden, and Bhutan

Figure 9: Weighting coefficients of the Triple Bottom Line in Japan, Sweden, and Bhutan



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The coefficient of economy is weakest in Sweden, and Japan is also weak following Sweden. But Bhutan shows society first, second economy, environment last. It seems that citizens in developed countries put more emphasis on environment than on economy.

8. Analyses of the open-ended question on ideal society

8.1 Ranking of words from Japan and Sweden

The *True Teller* text mining software developed by the Nomura Research Institute (www.trueteller.net) was used for the analyses of the answers given to the open-ended question. Since this software requires at least 200 samples for its appropriate function, Bhutan, having only five samples, was excluded from the analyses. A question, "What is the ideal society that would give you a sense of wellbeing and a high degree of satisfaction?" was asked in Japan, and in Sweden. In Japan, 1756 out of 2109 respondents, and in Sweden 227 out of 300 respondents answered this question. *True Teller*, decomposes all sentences to words, and arranges an order according to the frequency of appearance of the words, that is the word ranking. See Table 9 and 10 for ranking of words from Japan and Sweden respectively.

Table 9: Ranking of words from Japan

	Word	Part of speech	Frequency	Ratio (%)	Number
1	Society	Noun	1331	61.22	1075
2	No	Adjective	335	17.54	308
3	Life	Noun	288	14.92	262
4	Have	Verb	299	14.18	249
5	Person	Noun	235	10.25	180
6	Environment	Noun	180	9.40	165
7	Gap	Noun	165	8.54	150
8	Think	Verb	188	8.43	148
9	Lead a life	Verb	145	8.26	145
10	Healthy	Adjective	112	6.38	112
11	I (myself)	Noun	136	6.38	112
12	Feel secure	Verb	114	6.26	110

Practice and Measurement of Gross National Happiness

13	Family	Noun	115	6.26	110
14	Live a life	Verb	102	5.81	102
15	None	Adjective	120	5.81	102
16	Equal	Adjective	82	4.61	81
17	Crime	Noun	76	4.33	76
18	Mind	Noun	84	4.27	75
19	Ideal	Noun	79	4.16	73
20	Economy	Noun	75	4.10	72
21	Stabilize	Verb	74	3.99	70
22	Economical	Adjective	73	3.99	70
23	Fewer	Adjective	76	3.99	70
24	Old-age	Noun	68	3.82	67
25	Job	Noun	71	3.76	66
26	Income	Noun	68	3.70	65
27	Work	Verb	72	3.70	65
28	Education	Noun	71	3.64	64
29	Child(ren)	Noun	74	3.64	64
30	Welfare	Noun	63	3.59	63
31	Feel	Verb	65	3.36	59
32	Live	Verb	63	3.36	59
33	Safe	Adjective	58	3.30	58
34	Own	Verb	64	3.30	58
35	World	Noun	67	3.30	58
36	War	Noun	59	3.30	58
37	Anxiety	Noun	63	3.30	58
38	Enrich	Verb	58	3.25	57
39	High	Adjective	54	2.90	51
40	Who	Noun	50	2.85	50
41	Food, clothing, and Housing	Noun	47	2.68	47
42	Human being	Noun	51	2.68	47
43	Obtain	Verb	47	2.62	46
44	Reward	Verb	46	2.56	45
45	Peace	Noun	44	2.51	44
46	Wealthy	Adjective	45	2.51	44
47	Good	Adjective	51	2.51	44
48	Everybody	Noun	46	2.45	43
49	Individual	Noun	51	2.45	43
50	Nature	Noun	44	2.39	42

Table 10: Ranking of words from Sweden

	Word	Part of speech	Frequency	Ratio (%)	Number
1	Society	Noun	183	63.00	143
2	Have	Verb	47	19.38	44
3	Person	Noun	54	19.38	44
4	Education	Noun	44	18.06	41
5	Equal	Adjective	42	17.18	39
6	Environment	Noun	35	15.42	35
7	Good	Adjective	41	14.98	34
8	Own	Verb	36	14.98	34
9	Job	Noun	32	13.66	31
10	I	Noun	34	13.22	30
11	No	Adjective	29	11.45	26
12	Who	Noun	28	11.45	26
13	Everybody	Noun	23	9.69	22
14	Receive	Verb	22	9.69	22
15	Food	Noun	22	9.69	22
16	People	Noun	23	9.69	22
17	Economy	Noun	14	6.17	14
18	Important	Adjective	15	6.17	14
19	Life	Noun	14	6.17	14
20	Necessity	Noun	16	6.17	14
21	Freedom	Noun	14	5.73	13
22	Reside	Verb	13	5.73	13
23	Democracy	Noun	13	5.73	13
24	Sweden	Noun	12	5.29	12
25	Healthcare	Noun	12	5.29	12
26	Opportunity	Noun	12	4.85	11
27	Healthy	Adjective	11	4.85	11
28	We	Noun	12	4.85	11
29	Income	Noun	12	4.85	11
30	Obtain	Verb	11	4.85	11
31	Equality	Noun	11	4.85	11
32	Give	Verb	11	4.85	11
33	Money	Noun	10	4.41	10
34	Do	Verb	11	4.41	10
35	Individual	Noun	10	4.41	10
36	High	Adjective	10	4.41	10
37	Human being	Noun	12	4.41	10

38	Poor	Adjective	11	4.41	10
39	Utopia	Noun	9	3.96	9
40	Think	Verb	9	3.96	9
41	Work	Verb	9	3.96	9
42	It	Noun	8	3.52	8
43	Balance	Noun	8	3.52	8
44	Level	Noun	8	3.52	8
45	Wish	Verb	8	3.52	8
46	Myself	Noun	9	3.52	8
47	Person(s)	Nous	9	3.52	8
48	Responsibility	Noun	8	3.52	8
49	Earth	Noun	8	3.52	8
50	Consider	Verb	8	3.52	8
51	Welfare	Noun	8	3.52	8

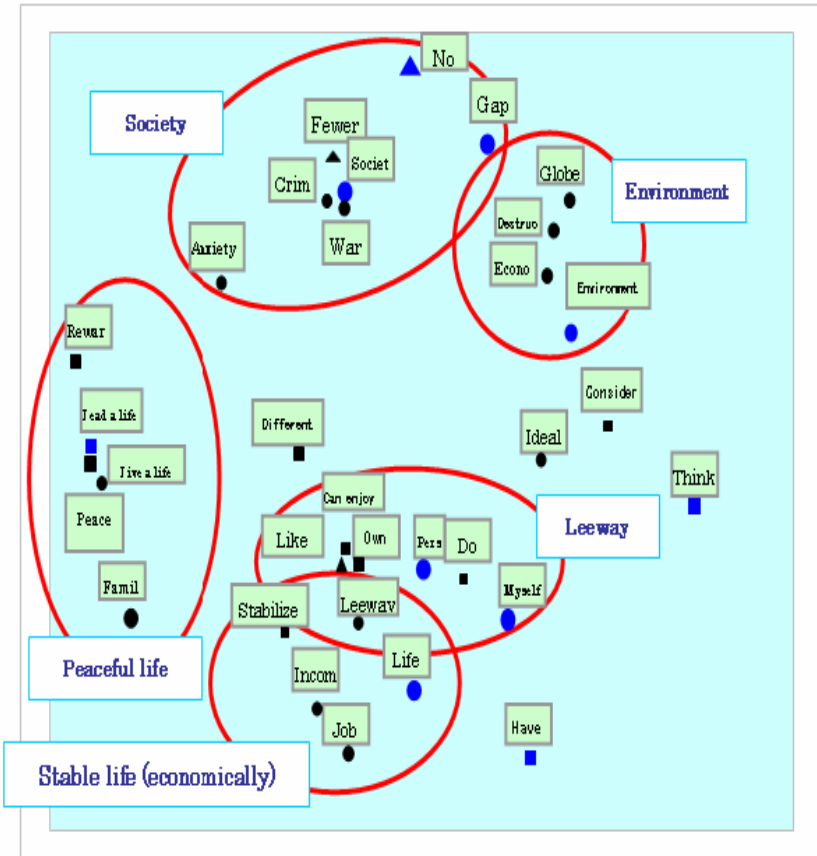
In the ranking of words from Japan, there are words related to life and mental peace, such as life, lead a life, health, security, and mind. In the case of Sweden, 33 of the top 50 words in the ranking are nouns (27 nouns in Japan), and there are more concrete words, such as education, environment, job, food, necessity, democracy, and opportunity, of which democracy does not appear in Japan's ranking.

8.2 Mapping of words from Japan and Sweden

The mapping of words is done with principal component analysis by using *True Teller* text mining software to show the two-dimensional relevance between words.

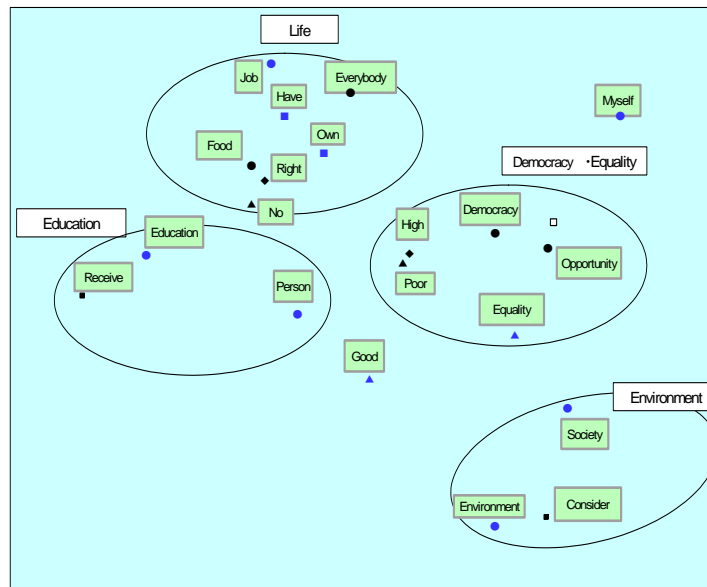
(1) Mapping of words in Japan, all respondents

Figure 10: Mapping of words in Japan, all respondents (n=1756)



(2) Mapping of words in Sweden, all respondents

Figure 11: Mapping of words in Sweden, all respondent (n=227)

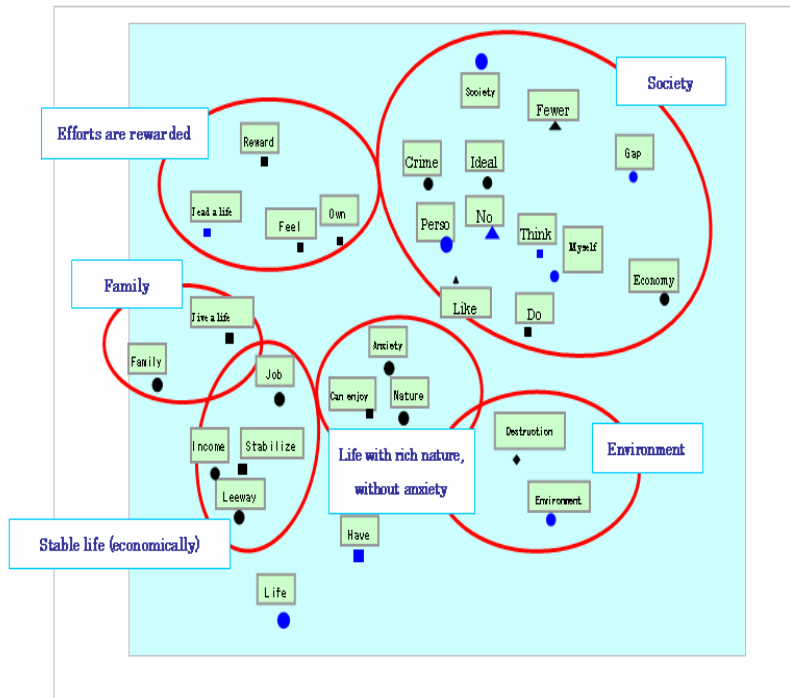


The mapping of words in Sweden shows that “ideal society”, everybody has the right to job and food, where much consideration is given to “environment”, and the society with “democracy” and “equality” and the right to “education”. Aspects of life and environment have common key words with the case of Japan, but the key words “democracy”, “equality” and “education” do not appear in mapping in Japan.

Aspects of “life” and “environment” have common key words with Japan, but the key words “democracy”, “equality” and “education” do not appear in Japan, but only in Sweden.

(3) Mapping of words, Japanese males

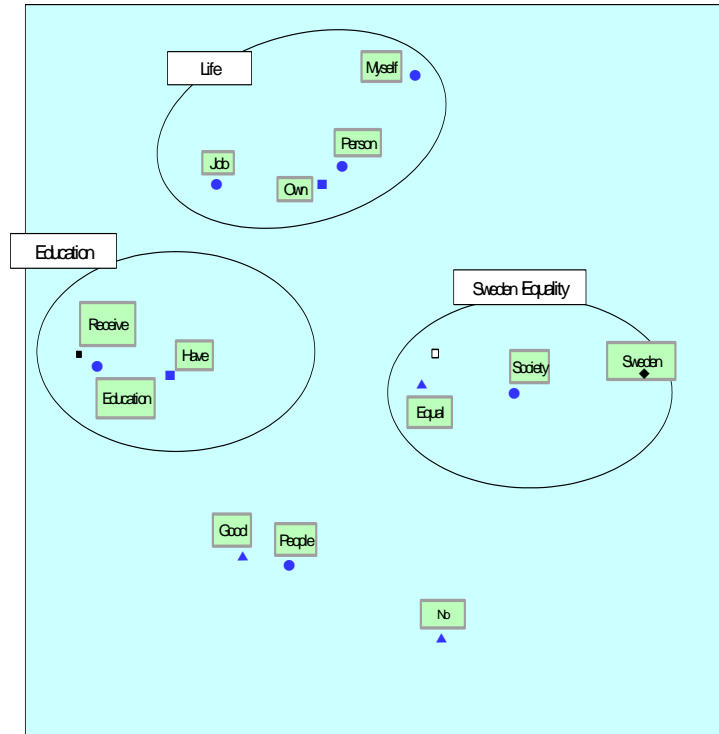
Figure 12: Mapping of words, Japanese males (n=936)



“Society” and “environment” are common with the case of all respondents. However, there are some key words that are characteristic for Japanese males, such as “efforts are rewarded”, “stable life (economically)”, “life with rich nature without anxiety”, and “family”.

(4) Mapping of words, Swedish males

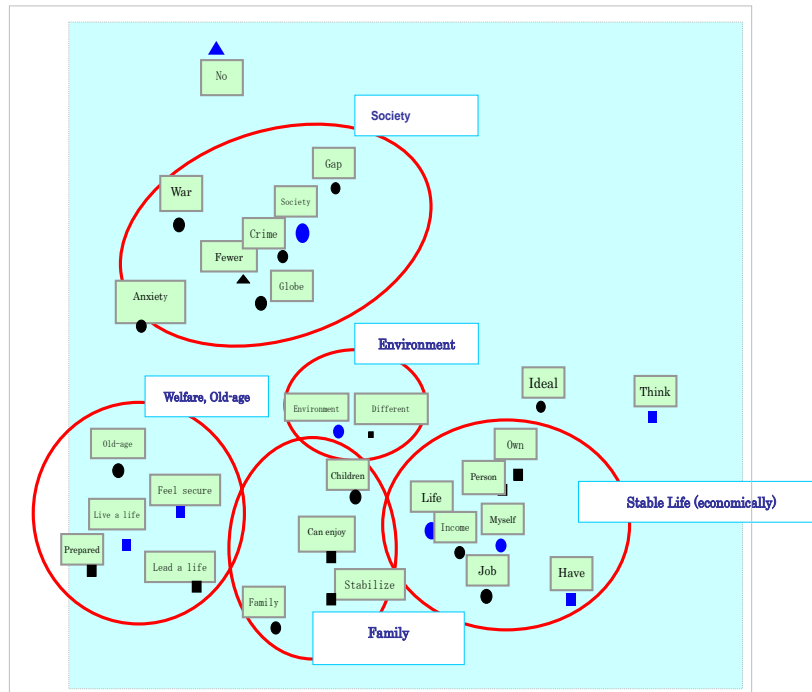
Figure 13: Mapping of words, Swedish males (n=116)



Those words such as to receive “education” and “equality” appeared, just like in the analysis of all respondents (Figure 11). Also, the Swedish society is depicted as ideal society.

(5) Mapping of words, Japanese females

Figure 14: Mapping of words, Japanese females (n=820)



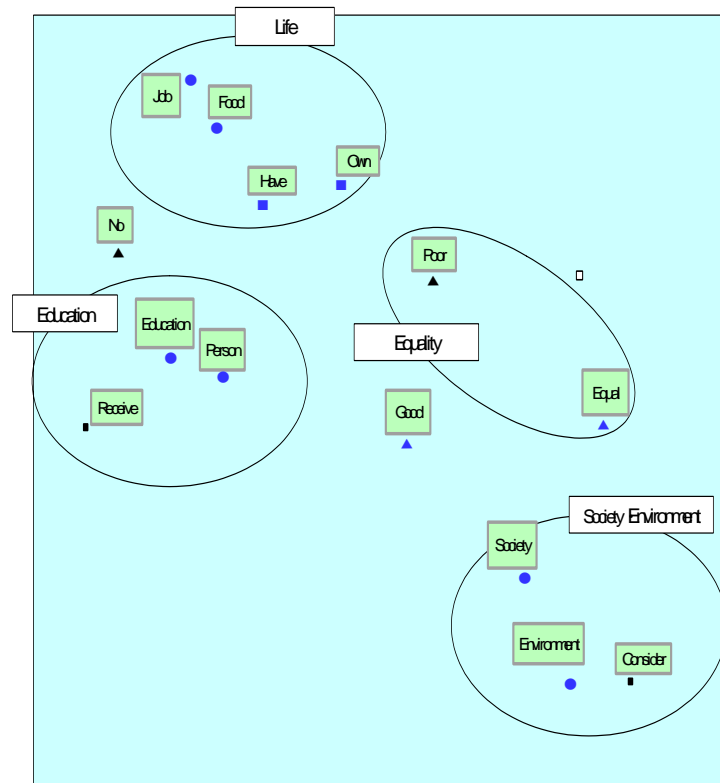
In this analysis, “society without gap, crime, war, and anxiety”, “environment”, “stable life (economically)” appeared. These words are common with the whole sample and Japanese males, but “welfare and old-age” appeared in the case of females.

“Society without gap”, and “environment” are common key words with all respondents and males of Japan.

But “welfare and old-age” appeared in the case of Japanese females.

(6) Mapping of words, Swedish females

Figure 15: Mapping of words, Swedish females (n=111)



Some characteristic key words are “life (with job and food)”, “society and environment” Those key words as “education” and “equality” consistently appear as in all respondents and males in Sweden.

8.3 Commonalities and differences between the Japanese and Swedish societies

“Consideration to environment” and “stabilization of life” are common keywords in Japan and Sweden. In Japan, “society without gap (or anxiety)” commonly appears in males, females, and all respondents.

The key words “democracy”, “equality”, and “education” appear only in Sweden. What is the social background where these words appear? It is necessary to further investigate the Swedish society. From the key words “democracy”, “education”, and “equality”, it is understood that an ideal society for the Swedish people is the society where democracy functions well, and everybody has equal opportunities, and that they put emphasis on education that passes democracy onto the next generation.

In fact, Law of School of Sweden defines that school activities must be based on democratic values (Chapter One), and chapters one and two of the Instrument of Government, one of the four basic laws in Sweden, emphasizes democracy as nation’s cornerstone. In other words, children in Sweden grow up with democracy being internalized in them. On the other hand in Japan, there is no word “democracy” in Constitution or in Fundamental Law of Education (both old and new versions). In Sweden, students are trained to debate where different interests are discussed in order to find democratic solutions, such as environmental problems that involve conflicts between different interests.

9. Summary and suggestions

From HSM version four, the weighting coefficients based on the AHP method were adopted to the indicators of the six categories, and using the new HSM values, HSM ver.4 and 5 were developed. Subsequently a more concrete picture of HSM emerged.

The order of the weighting coefficients of the Triple Bottom Line both in Japan and Sweden is “environment” as the highest, followed by “society”, and “economy”. Now in Japanese society, economy often receives a high priority, but respondents of this research put higher priority on environment than on economy, which is eye-catching. Through the mapping of words given to the open-ended question, it was possible to summarize ideal society depicted by the respondents in Japan and Sweden. A comparison of these two countries allows the author to consider future direction of Japan’s society.

The mapping of words shows that policies needed in Japan are “society without gap and anxiety”, “consideration to environment”, and “stabilization of life” that would construct a welfare society. Those words “democracy”, “equality”, and “education” that appeared in Sweden but not in Japan in the mapping, are suggestive for Japan. Considering sustainability of the Japanese society, it is necessary to increase transparency in the society, so that the young people can have a hope in the society. Although Japan is regarded as a democratic country, the low voting rate of 58.64 percent (The House of Councilors, 2007), does not deserve this perception, compared with Sweden that had 80.4 percent in national election in 2006.

Realizations of “society without gap and anxiety”, “consideration to environment”, and “stabilization of life” are essential for sustainability of Japan’s society, in which the government and administrations should engage. To work on “democracy”, “equality”, “education” is unavoidable to build a sustainable society for the future generation. The present author would like to continue this study to a farther step, because the study on HSM through comparison with other countries would provide lots of suggestions for Japan to pursue sustainability of the society.

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