

Development of a gender equality index and measurement of gender equality in South Korea

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1. Purpose of the development of a gender equality index

According to previous research, gender equality is both directly and indirectly related to national economic development and competitiveness. The World Bank has stated that rate of economic growth shows a significant positive correlation with gender equality (correlation coefficient 0.35). Also, countries with a higher level of gender inequality tend to demonstrate a higher level of poverty. In particular, 0.95 out of the 2.5 percentage points marking the difference between the economic growth rates of South and East Asia and 0.56 out of the 3.3 percentage points of the economic growth discrepancy between Sub-Saharan Africa and East Asia can be attributed to gender inequality in education (S. Klasen, 2002). Accordingly, countries have implemented a range of policies targeting gender equality. In particular, the Beijing Platform for Action crafted by the United Nations in 1995 recommended that state agencies promote gender equality policies. As of 2008, 192 countries have installed a governmental organization that exclusively deals with gender equality policies.

Since the inception of the Ministry of State Affairs in 1988 and the Ministry of Gender Equality in 2001, South Korea has been making ongoing efforts to promote gender equality. According to gender equality indices published by international organizations, gender equality in South Korea stands considerably lower than in other OECD countries, which indicates that customs and systems in the country still need to be adjusted in order to secure sustainable development and improved quality of life. To achieve this, it appears necessary to identify the level of gender inequality, its sources, and the level of improvement in each sector of the society and in the nation as a whole.

Commissioned by the Ministry of Gender Equality and Family (MOGEF), this research has developed a South Korean gender equality index designed to measure the level of gender equality in the country as a whole and in each sector of the society. Using the gender equality index and indicators, the trends and changes in gender equality in South Korea were traced. The MOGEF will publish the gender equality index for the nation and each sector of society on a regular basis with the aim to heighten public awareness and to monitor the directions and challenges of the country's gender equality policies by tracking the status, causes, and improvement

of gender inequality issues.

2. Sectors and indicators of the South Korean gender equality index

A. Sectors and indicators of the gender equality index

The indicators of the South Korean gender equality index are constructed as outcome indicators rather than input indicators, in accordance with the nature of gender equality and the purpose of the index. Among indicators designed for international comparison of level of gender equality, the Global Governance Initiative (GGI) of the World Economic Forum, the Gender Equality Index (GEI) by Social Watch, and the Gender-related Development Index (GDI) and the Gender Empowerment Measure (GEM) by the UNDP are outcome indicators, while the Social Institutions and Gender Index (SIGI) of the OECD is an input indicator. The advantage of the SIGI is that it makes it relatively simple to identify the causes of gender inequality and to thereby execute policies. However, the value of the index does not necessarily respond commensurately to the actual level of gender equality.

Furthermore, the South Korean index measures gender equality based on the gap between men and women. In general, the gap between men and women refers to a gap in poverty, salary, skills, etc. and is represented by difference or ratio. The GGI of the World Economic Forum and the GEI by Social Watch estimate gender equality using the difference in the values of an indicator. Meanwhile, the GDI and GEM from the UNDP determine the level of gender equality by taking into account both the difference in the values of indicators and the levels of achievement. In this case, as both the level of achievement and differences between men and women in specific areas are reflected in the index, when other conditions are assumed to be equal the level of gender equality in more industrialized countries offering greater access to resources by their constituents appears to be higher than that of their counterparts. Also, when gender equality is assessed based on the differences in levels of indicators, it is not a simple matter to ascertain whether improvement in the level of gender equality results from the changes in the level of the indicator or from an actual reduction in a gap between men and women. In contrast, one advantage of indices, like the South Korean index, that measure the level of gender equality based on a gap between men and women is that the level of gender equality and its changes in the country as a whole and by societal sector are made clear.

The South Korean Gender Equality Index is constructed as a management indicator designed to monitor the level of gender equality by societal sector and inform the management of related policies, as well as serve as a definitive indicator to quantitatively measure the level of gender equality. Among previous compilations of gender equality statistics from South Korea, the Social Indicator of Statistics Korea consists of 13 areas, including population; household and

family; income and consumption; labor; education; housing and transportation; information and communication; environment; welfare; culture and leisure; safety; and government and social participation. The Gender Equality Indicator of the Korean Women's Development Institute (2006) comprises nine sectors, including population; family; education; economic activity and income; political and social participation; health; welfare; culture; and violence and crime. In consideration of these two indicators and the opinions of experts and relevant ministries, the dimensions of the South Korean Gender Equality Index have been finalized to comprise eight sectors including family, welfare, public health, economic activity, decision-making, education and vocational training, culture and information, and safety. Spanning these eight areas, the gender equality index is expected to identify the level of gender equality across South Korean society and simultaneously reflect the content and performance of governmental gender equality policies.

Regarding the process of selecting the indicators composing the South Korean Gender Equality Index, 149 indicators were initially identified through expert meetings out of a pool of 226 gender equality indicators produced by experts from the eight sectors in question. Next, 200 experts from relevant areas including professors, researchers, and public servants were asked to rank the 149 indicators in terms of significance (0-10 points) and priority (rankings 1-5), and to suggest additional indicators that need to be further developed in the sector. Based on the survey, representative indicators to entail the South Korean Gender Equality Index were selected from among those with greater significance and higher priority.

The representative indicators that are used to estimate the South Korean Gender Equality Index make the level of and trends in the country's gender equality readily identifiable, as well as the level of gender equality by sector and causes for change, if any. Therefore, representative indicators should allow the production of regular statistics through a nationally representative sample survey, female-to-male ratios, and international comparisons. Among the indicators ranked high in significance and priority by experts from the eight sectors, those that meet the requirements for representative indicators were selected as the indicators for the South Korean Gender Equality Index. In addition, indicators that need to be managed as a policy approach to monitor and improve the index by sector, known as administrative indicators, were chosen. Among these administrative indicators are ones that are unable to produce female-to-male ratios but are required in order to enhance women's status, such as female-specific indicators. In addition, indicators able to estimate level of gender equality but for which relevant statistics are not currently produced or where the interval of production is long or those that are surveyed from statistically non-representative samples are included in order to allow them to be managed by relevant administrative organizations.

As explained above, the indicators included in the South Korean Gender Equality Index aim to identify the level of and trends in South Korea's gender equality and sectional gender equality levels and the causes of any change, as well as monitor and evaluate ministerial policies relat-

ed to the corresponding indicators. For this purpose, both the representative and administrative indicators underwent a moderation process in consultation with relevant ministries. Table 1 shows the 20 representative indicators from the eight sectors that have been selected through research and consultation with ministries.

Table 1. Representative indicators from the eight sectors forming the South Korean Gender Equality Index

Sector (no. of indicators)	Code	Representative indicators	Organization in charge/partner organization
① Family(2)	1-1	Gender ratio in the time spent on housework	Ministry of Gender Equality and Family
	1-2	Sex ratio at birth of third- and later-born children	Ministry of Gender Equality and Family
② Welfare(3)	2-1	Gender ratio of the heads of underprivileged households	Ministry of Health and Welfare
	2-2	Gender ratio of subscribers to the public pension	Ministry of Health and Welfare, Ministry of Education, Science and Technology, Ministry of Public Administration and Security
	2-3	Gender ratio of the employed among people with disabilities	Ministry of Health and Welfare, Ministry of Employment and Labor
③ Public Health(2)	3-1	Gender gap in health-related quality of life (EQ-5D)	Ministry of Health and Welfare
	3-2	Gender ratio of the recipients of payments from National Health Insurance	Ministry of Health and Welfare
④ Economic activity (3)	4-1	Gender ratio of participants in economic activities	Ministry of Employment and Labor
	4-2	Gender gap in salary (gender ratio) ¹⁾	Ministry of Employment and Labor
	4-3	Gender ratio of permanent workers	Ministry of Employment and Labor
⑤ Decision-making (3)	5-1	Gender ratio of lawmakers	National Assembly Secretary,
	5-2	Gender ratio of public servants at grade 5 or higher	National Election Commission
	5-3	Gender ratio of manager- or higher-level employees in business	Ministry of Public Administration and Security Ministry of Employment and Labor
⑥ Education and vocational	6-1	Gender gap in average number of years of education (gender ratio) ¹⁾	Ministry of Education, Science and Technology

Sector (no. of indicators)	Code	Representative indicators	Organization in charge/partner organization
training(3)	6-2	Gender ratio in advancement to tertiary education	Ministry of Education, Science and Technology
	6-3	Gender ratio of participants in vocational training for employed workers	Ministry of Employment and Labor
⑦ Culture and information(2)	7-1	Gender ratio in time spent for leisure activities	Ministry of Culture, Sports and Tourism
	7-2	Gender ratio of workers in the cultural content industry	Ministry of Culture, Sports and Tourism
⑧ Safety(2)	8-1	Gender gap in fear of crime (gender ratio) ¹⁾	Ministry of Justice, National Police Agency
	8-2	Gender ratio of victims of aggravated felony	Ministry of Justice, National Police Agency

1) Gender gap means a difference between the two sexes. Accordingly, it is represented as a sex ratio.

B. Estimation of the South Korean Gender Equality Index

The South Korean Gender Equality Index is measured based on the discrepancies between men and women. The advantage of those indices that measure gender equality using the difference between the two sexes, including the South Korean Gender Equality Index, is that they can easily determine the level of gender inequality in the nation as a whole and by sector, as well as the causes of change.

The South Korean Gender Equality Index is created through the five stages described below. In the first stage, the values of all indicators are converted into female-to-male ratios, except the gender ratio of the third child, for which the value of the indicator went through normalization prior to conversion. The converted indices represent the differences in the level of achievement between men and women, rather than the level itself. Among gender equality indicators, both the time spent on housework and the time spent at leisure activities are related to the use of the 24 hours of each day. Also, employed people spend a smaller amount of time on housework compared to unemployed people due to the obligations placed on their time in their employment contract. Furthermore, even though employed men and women and their unemployed counterparts spend the same amount of time on housework, there is a gender gap in the time spent on housework if the employment rates between the two sexes differ. Therefore, the gender ratio in time spent on housework was measured under the condition of controlling the status of employment. That is, the time spent on housework among employed men and women

and the time spent on housework among unemployed men and women were simply averaged under an assumption that the employment rates for men and women are equal. The time spent in leisure activities is also affected by the time spent on paid economic activities. Accordingly, the gender ratio in the time spent in leisure activities was estimated while controlling for employment status. In addition, some gender equality indicators were converted into an inversion of the female-to-male ratio. For example, the values of the indicators for time spent on housework, the number of beneficiaries of National Health Insurance, and the number of victims of crime are in a reverse relationship with the desirable situation. In this regard, these values were converted into an inversion of the gender ratio.

In the second stage, some indicators are normalized. The natural sex ratio at birth of the third child is 1.06; therefore, the equality benchmark for the female-to-male ratio of the third child is 0.944, the inverse of the natural gender ratio at birth. In general, when the equality benchmark is not equal to one and if the value of an indicator is proportionately related to the level of gender equality, function (1) is used to normalize the value; if the value of an indicator is reversely related to gender equality, the normalization function (2) is applied¹⁾.

$$x = [(x - \text{Min}(x)) / (\text{Max}(x) - \text{Min}(x))] \quad (1)$$

$$x = [(\text{Max}(x) - x) / (\text{Max}(x) - \text{Min}(x))] \quad (2)$$

In the third stage, the converted values are assigned weights. Assuming that gender equality means equal rights, obligations, and opportunities for men and women, the index value of a specific gender equality indicator is moderated by the male and female population related to the indicator. Accordingly, the inverse of the female-to-male population ratio relevant to each indicator is applied as weighting to the gender ratio of the full group of gender equality indicators. For permanent employees, the inverse of the number of paid female employees-to-paid male employees among those aged 15 or older is applied. However, in the case of indicators for the number of recipients of the benefits of the National Health Insurance and the number of victims of crime, the gender ratios of the relevant populations are used as weights. Table 2 shows the manner of calculation of the values of the indicators for each sector that comprise the gender equality index, based on the three stages mentioned above.

In the fourth stage, the index score for each sector is calculated. The index of each gender equality indicator for each sector is determined through averaging. In the process of determining the

1) There are in general nine ways to normalize an index including ranking ($I = \text{Rank}(x)$), standardization ($I = (x - x_m) / \sigma$), Min-Max $I = [x - \text{Min}(x)] / [\text{Max}(x) - \text{Min}(x)]$, distance to a reference, categorical scale, and conversion of the indicators above and below the mean. For normalization methods and characteristics, see OECD (2008), pp. 27-30.

gender equality index by sector, the GGI of the World Economic Forum obtains its scores through the weighted average of the indicators belonging to each sub-sector index. However, all other indices, including the South Korean Gender Equality Index, simply average the index values for each sector.

In the fifth stage, the South Korean Gender Equality Index is estimated. The South Korean Gender Equality Index is a composite of indicators consisting of sub-indicators of eight different sectors. Accordingly, when the value of the South Korean Gender Equality Index is calculated using the gender equality index values for each sector, it is essential to apply weights to the index values of each sector. For the South Korean Gender Equality Index, the weights for the estimation of the index were created using the analytic hierarchy process²⁾.

In order to determine weights, 200 experts related to gender equality issues, including professors, researchers, and public servants, were consulted on the relative importance of the eight areas. The weights obtained through the analytic hierarchy process are the following: economic activity and income is 0.19, education 0.14, welfare and decision-making 0.13, respectively, safety 0.12, family 0.11, public health 0.10, and culture and information 0.08³⁾. The South Korean Gender Equality Index was estimated by applying the corresponding weights to the index values for each sector.

Table 2. Calculation of the index for each indicator in the South Korean Gender Equality Index

	Sector	Calculation of the indicator	Equation
Family	Housework	Gender ratio in time spent on housework under the condition of controlling employment status (inverse number)	$X = 1 / [W_Em \times T_Em + W_NEm \times T_Nm] / [W_Ef \times T_Ef + W_NEf \times T_Nf]$
	Gender ratio at birth (male child)	Gender ratio of the third- and later-born child moderated by the natural ratio at birth	$X = [(Max - (NCHm / NCRf))] / [Max - Nsr]$
Welfare	Subscribers to the National Pension Fund	Gender ratio of subscribers to the National Pension Fund moderated by the gender ratio of the relevant population	$X = W_m/f \times [F / M]$
	Heads of underprivileged households	Gender ratio of heads of underprivileged households moderated by the gender ratio of the relevant population	$X = W_m/f \times [F / M]$
	Employed workers with disability	Gender ratio of employed workers with disability moderated by the gender ratio of peo-	$X = W_m/f \times [F / M]$

2) The weighting methods used in the estimation of composite indicators include the analytic hierarchy process, unobserved components model, public opinion, budget allocation, and data envelopment analysis. OECD(2008), pp. 89-98.

3) According to an investigation by experts, the consistency rate of the weights by sector is statistically significant at 0.00.

	Sector	Calculation of the indicator	Equation
	ties	ple with disabilities	
Public Health	Health-related quality of life Recipients of the benefits of the National Health Insurance	Gender ratio in health-related quality of life Gender ratio of hospitalized patients moderated by the gender ratio of the relevant population (inverse number)	$X = [F / M]$ $X = W_{m/f} \times [1 / (F / M)]$
economic Activities	Participants in economic activities Salary Permanent employees	Gender ratio of participants in economic activities moderated by the gender ratio of the relevant population Gender ratio in salary Gender ratio of permanent employees moderated by the gender ratio of the relevant population	$X = W_{m/f} \times [F / M]$ $X = [F / M]$ $X = W_{m/f} \times [F / M]$
Decision-making	Number of lawmakers Public servants (grade 5 or higher) Managers or higher	Gender ratio of lawmakers moderated by the gender ratio of the relevant population Gender ratio of public servants at grade 5 or higher moderated by the gender ratio of the relevant population Gender ratio of manager- or higher-level employees moderated by the gender ratio of the relevant paid workers	$X = W_{m/f} \times [F / M]$ $X = W_{m/f} \times [F / M]$ $X = W_{m/f} \times [F / M]$
Education and vocational training	Years of education School enrollment rate Participants in vocational training	Gender ratio in years of education moderated by the gender ratio of the relevant population Gender ratio in enrollment rate at tertiary education institutions Gender ratio of participants in vocational training moderated by the gender ratio of relevant paid workers	$X = W_{m/f} \times [F / M]$ $X = [F / M]$ $X = W_{m/f} \times [F / M]$
Culture and information	Time spent at leisure activities Employees in the culture industry	Gender ratio in time spent at leisure activities under the condition of controlling employment status Gender ratio of employees in the culture industry by the gender ratio of relevant population	$X = [1/2 \times (W_{Em} \times T_{Em} + W_{NEm} \times T_{Nm}) / [1/2 \times (W_{Ef} \times T_{Ef} + W_{NEf} \times T_{Nf})]]$ $X = W_{m/f} \times [F / M]$
Safety	Fear of victimization by crime Victims of crime	Gender ratio of those who are not in fear of victimization by crime by the gender ratio of the relevant population Gender ratio of victims of aggregated felony by the gender ratio of the relevant population (inverse number)	$X = W_{m/f} \times [(F / M)]$ $X = W_{m/f} \times [1 / (F / M)]$

- Notes 1) F and M indicates the values of female indicator and male indicator for each sector, respectively.
 2) $W_{m/f}$, the inverse of the relevant female-to-male population, is used as a weight.
 3) W_{Em} and W_{Ef} refer to weights that represent the ratio of the employed among relevant women and that of the employed among relevant men, respectively.
 4) The maximum value for the sex ratio at birth is 2.0 (South Korea's sex ratio of the third child between 1993 and 1994 was 2.029; reference value: 2.027) and the minimum value is estimated based on the natural ratio at birth (1.06 as published by the UN). NCHm: no. of male babies, NCRf: no. of female babies, Nsr:: the natural sex ratio at birth as published by the UN

3. Level and trend of gender equality in South Korea

The value of the South Korean Gender Equality Index is designed to rise from '0.0' (unequal) to 100.0 (equal) as the level of gender equality improves. According to this measure, the nation's Gender Equality Index stood at 61.2 in 2009, a slight increase over the previous year. The index value continued to rise from 57.6 in 2005 to 61.1 in 2008; of note during that period, the index made a greater jump (1.4 percentage points) between 2006 and 2007 than the 1.1 percentage point increase for the period of between 2007 and 2008. According to the trend of the South Korean Gender Equality Index, gender equality of South Korea improved from 2005 to 2008 and has been relatively stalled since that point, although there was a slight improvement in 2009.

(unit: gender equality=100.0)

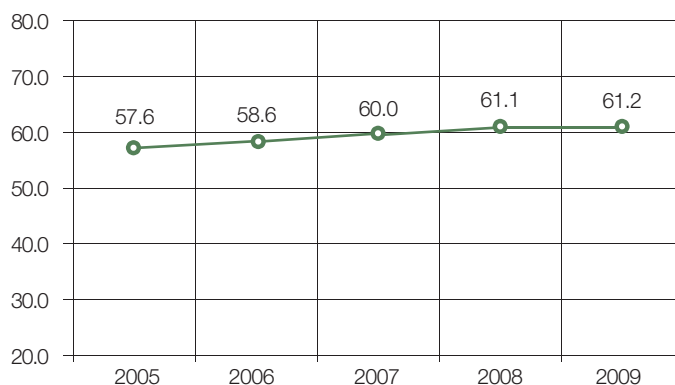
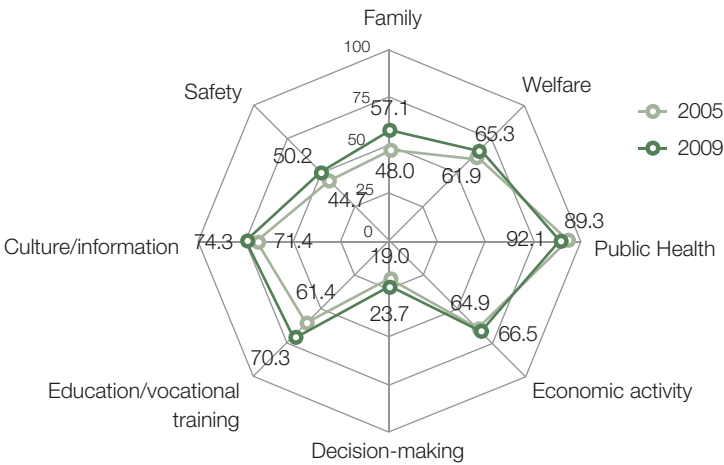


Figure 1. Trend in the value of the National Gender Equality Index

In terms of sector, public health marked the highest level of gender equality in 2009, followed by culture and information, education and vocational training, economic activity, welfare, and family. The decision-making area showed the lowest level of gender equality, followed by safe-

ty (Figure 2). Compared to 2005, family and education/vocational training made the greatest progress, followed by safety, decision-making, welfare, culture and information, and economic activity. Meanwhile, the level of gender equality in the public health sector was aggravated.

(unit: gender equality=100.0)



* Note: Weights by sector are reflected in the index values.

Figure 2. Level of gender equality by sector in South Korea

Regarding the trends in gender equality by sector, public health, which currently exhibits the highest level of gender equality, has experienced a steady decline since 2005. The main cause of such deterioration can be attributed to the fact that the number of cases of payments for hospitalization of women has been rising faster than the figure for men, while the indicator for health-related quality of life has remained relatively unchanged. The index for the area of culture and information made a significant jump in 2007 after experiencing a decline in the period between 2005 and 2006. Although it trended down again after that point, the level of gender equality in 2009 was higher compared to 2005 and 2006.

The gender equality level in the public welfare sector has been gradually on the increase since 2005, mainly due to the disproportionate growth rate in the number of female subscribers to the public pension fund than that for men. In particular, the number of female subscribers in wholesale/retail businesses, social services, and self-employed service industries and the number of uncategorized female subscribers significantly increased. Due to the 2008 global financial crisis, however, in 2009 the growth rate of poverty among female heads of households was slightly higher than the rate among their male counterparts.

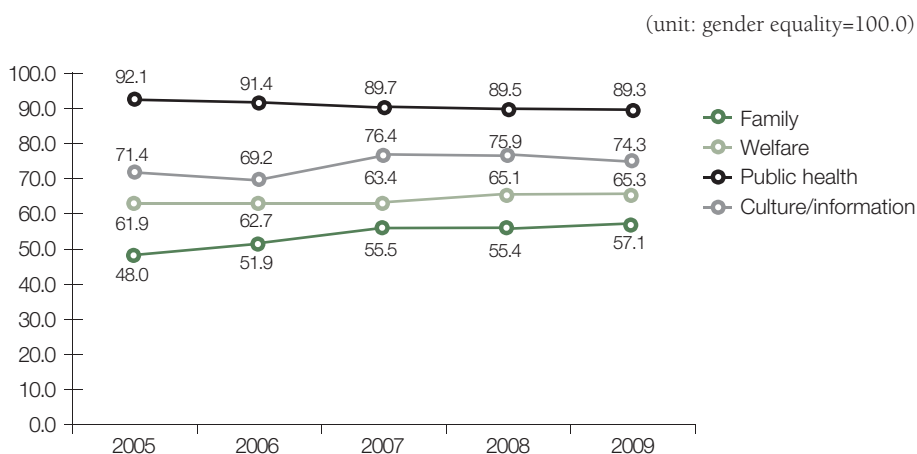


Figure 3. Trends in the level of gender equality by sector (1)

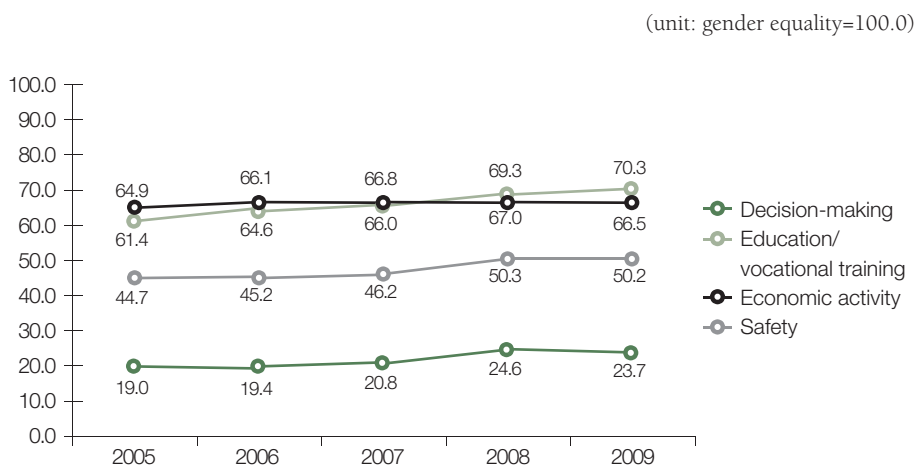


Figure 4. Trends in the level of gender equality by sector (2)

The gender equality index for the family sector in 2005 was the third lowest with a score of 48.0, following decision-making and safety. However, the gender gap in the area has rapidly narrowed since 2005, with the exception of 2008. What is notable is that men spent a small amount more time on housework in 2009, while women spent slightly less, regardless of employment status. Thanks to this gradual progress, the family sector has witnessed a significant improvement in gender equality. However, the gender discrepancy remains wide compared to other sectors.

Meanwhile, the gender equality index, or the overall level of gender equality, in the education and vocational training sector has been on a continuous rise since 2005. This phenomenon is interpreted as a result of two factors: the narrowing gender gap in the enrollment rate in tertiary educational institutions and the improving gender equality in the vocational training sector stemming from a rising number of female workers participating in vocational training programs for employed workers and an accelerating growth rate in the number of female participants. As a consequence, in 2009 men and women in the education and vocational training area were relatively equal compared to their counterparts in other categories. Meanwhile, the economic activity sector, which is considered to be gender equal relative to other sectors, had made progress until 2007 before experiencing a steady deterioration since the global financial crisis of 2008. In other words, the economic downturn triggered by the financial crisis had a greater impact on women's economic activities and lowered the number of female permanent employees. The gender gap in salary, however, has remained unchanged since 2008.

When it comes to the safety sector, the gender equality index has continued to increase since 2005, with a score of 44.7. While the gender discrepancy in this sector is generally wider than in other areas, it has been showing constant improvement. During the period of 2007 and 2008, the safety sector experienced great progress in gender equality. However, the situation reversed in 2009 as the number of female victims of aggravated felonies continued to grow at a rate of increase higher than the rate of male victims. Meanwhile, the decision-making sector, which demonstrates the lowest level of gender inequality, gradually progressed until 2008, with the score rising to 24.6. However, the figure dropped again in 2009. Examined by indicator, the gender ratio among lawmakers remained unchanged, while the proportion of female public servants at grade 5 or higher grew consistently through 2009. However, women experienced a larger drop in the number of manager- or higher-level employees, considered to be the decision-makers in the private sector, compared to their male counterparts. With the magnitude of the erosion in the private sector outpacing improvement in the public sector, the gender equality level in the decision-making sector worsened to a degree.

4. Suggestions for gender equality policies

According to the trend in the National Gender Equality Index, South Korea has made constant progress in gender equality. When compared with other countries, however, the international ranking is little changed. This could be attributable to the fact that although the levels related to the gender equality indicators have improved overall, the pace of progress in reducing the gender gap is slow. It is also due to severe inequality in certain areas, including decision-making, safety, and family. As a result, South Korea's ranking is gradually progressing in the GDI, which takes into account both levels in gender equality indicators and the gender gap, but remains within the mid-to-low

ranking group in the GEM, which consists exclusively of empowerment indicators, although both indicators and levels are evaluated.

In addition, South Korea remains in the lower group in the GGI and GEI, both of which consider only gender gaps when estimating the level of gender equality. Therefore, it appears necessary to focus a continuous and structural policy effort on reducing gender discrepancies in the areas of decision-making, safety, and family.

Regarding those areas and indicators that experienced a deterioration in gender equality in 2009, the indicators for economy-related areas that are directly and indirectly affected by economic conditions were temporarily aggravated in 2008 due to the global financial crisis. Hence, it is recommended that policies to bridge the gender gap in salary and employment rate be enacted in combination with the economic and industrial policies designed to revitalize the economy. Policies to resolve the issues of female irregular workers need to continue, regardless of any economic recovery.

Certain individual gender equality indicators in those areas, outside the economic sector, that are influenced by economic fluctuations had also demonstrated steady progress prior to temporarily reversing in 2008; these include indicators for the proportion of female employees at managerial or higher levels in the private sector, female workers in the cultural content industry in the culture sector, and female heads of underprivileged households in the welfare sector. Based on these findings, it is suggested that ministries responsible for those indicators monitor statistical changes in the indicators and reassess the effectiveness of existing gender equality policies in the altered socio-economic contexts following the economic turnaround.

In terms of safety, the number of female victims of serious crimes is rapidly increasing despite efforts to prevent cases of aggravated felony such as murder, armed robbery, and sexual assault. In order to enhance gender equality in the safety sector, it seems necessary to promote policies to structurally reduce the number of victims of serious crime. When it comes to the culture and information sector, both men and women are spending less and less time in leisure activities, regardless of employment status. Therefore, the government is advised to devise policies to raise available time and the quality of leisure activities in order to promote public quality of life as well as gender equality. Finally, in relation to the public welfare sector, in response to the country's rapidly aging population it is necessary to review health issues and challenges specific to both gender and age.

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