

# **Latent layers beneath the relationship between urban insecurity and climate change: Case of South Korea**

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## **1. Climate change and urban insecurity**

The purpose of this paper is to provide an overall picture about the resilient capacity of cities in South Korea in terms of adaptation to climate change. In the discussion about climate change so far, with the enthusiasm to prepare for the coming green bubble based on the expansion of renewable energies, too many resources and efforts have been concentrated on the mitigation rather than adaptation of climate change. However, adaptation deserves more serious concern regarding its impending and broad impact on human lives and those of other living beings. Recently, in particular after COP7 at Marrakesh, 2001, the focus of debate on climate change has shifted to adaptation.

As cities are estimated to emit almost 75% of greenhouse gas globally, they have been arenas of competition for measures to mitigate GHGs. However, cities are also vulnerable to climate change. Almost 2/3 of the world's population resides in cities, and almost half of city populations live in dilapidated dwellings or as squatters. This means that the globally dominant landscape of cities is slums (Davis, 2007). As 'poverty eradication', the number one target of the Millennium Development Goals, does not appear close to achievement, slum-dominant urbanization will likely expand.

Residents of the slum are not equipped with proper measures against natural disasters resulting from climate change such as urban floods, drought, epidemic diseases, heat waves, and so forth. Such vulnerability of cities is exacerbated by social factors like poverty, distorted population structure, chronic economic depression, unemployment, uprooted democracy, political oppression and so forth. Disproportionate burdens are placed on those least able to bear the cost. This means that climate change superimposes risks on the existing vulnerability of cities, which is derived from social factors (Hayes, 2008).

Urban security is endangered by the negative combination of social, economic, historical and ecological factors that are related to climate change. In other words, there are many layers beneath the relationship between urban insecurity and climate change. In line with such interconnections, enhancing the climate change adaptation capacities of cities could be understood to build resilience by increasing cities' ability to deal with current climate-related problems, preparing them to take advantage of new opportunities, and reducing the risks and costs of future climate change (Riley & Dalton, 2008). Therefore, to understand whether cities are able to adapt to or have resilience against the impact of climate change, we should figure out the latent layers beneath the cities. In the following sections, I will give brief explanations about the several layers of factors affecting cities in South Korea, i.e., political and historical, social and economical, manufactured environment, and ecological layers. Based on this understanding, I believe we can develop appropriate options for urban adaptation strategies to counter climate change.

## **2. Latent layers of urban insecurity in South Korea**

### **2.1. Historical and political layer**

As is well known, modern development of South Korea has been a process of making a modern nation-state. It is full of agony and conflict; colonization by imperial Japan, antagonism between the left and right wings, the Korean War, the divided-system of South and North Korea, military dictatorship, and a bloody democratization movement opposing the dictatorship. Among them, the legacy of Korean War and subsequent divided-system of South and North Korea has influenced every aspect of South Korean society: the political party system, economic growth policies, mentality of ordinary citizens, education system, cultural pattern, communications, emotions, mode of production of nature, and so forth. The divided system between North and South Korea paralyzed the progressive movement in South Korea. The relationship between North Korea and South Korea can be described as antagonistic dependency. The result of this legacy of a divided-system is the prevalence of an extremely conservative anti-communist ideology.

Another historical attribute of the modernization of South Korea is “negotiated democratization.” Although there were remarkable democratization movements, including numerous martyrs for democracy, student resistance and labor movements against the military regime and ruling elites, there was no revolution which reformed all the members of the existing ruling class. Through the democratization movement, formal democracy has been established, but substantial or practical democracy is not secured yet. Of course, there was a change in presidency. However, two presidents (Mr. Kim, Young-Sam and Mr. Kim, Dae-Joong) before Mr. Roh, Moo-Hyun, who were believed to represent the democratic groups, were actually the result of negotiated coalitions between conservative political groups. They could not perform the “transitional justice” to mature democratization (Elster, 2004). The same story can be applied to the case of Mr. Roh, even though there are differences to some extent. Therefore, the conservative political milieu has been sustained without transformation and the ruling class was not changed.

Such attributes of modernization, a “divided-system” and “negotiated democratization,” has made political conservatism dominant in South Korean society. In other words, negotiated democratization and the divided-system of North-South Korea have frustrated the maturation of democracy in South Korea. Conservative society limited the political imagination toward an admirable society. This means that the representation of various political and social interests are sterilized or limited. Although Koreans have accomplished democratization through unprecedentedly strong social movements against military dictatorship, practical democracy has not been institutionalized yet. With the seizure of political power by the conservative party after 10-years of the democratic party, democracy seems to be retreating. Peaceful candlelight demonstrations against the import of US beef were violently oppressed; a famous internet blogger who criticized the foreign currency policy of South Korea was arrested; the national security law remains; a law allowing newspaper companies to own broadcasting companies is proceeding towards enactment. So to speak, the return of a dictatorship is the proof of a feasible foundation of democracy in South Korea. Weak civil society has struggled to create alternative measures to tackle with the issue of climate change.

## **2.2. Social and economic layer**

South Korea was regarded as a successful example in the field of combating poverty. Since the rapid and compacted economic growth itself had lessened poverty, the social inequality issue was not that serious in spite of very low levels of social welfare (Chang, 2005: 98-99). At that time, poverty could be called ‘the poverty of hope.’ This means that, if one works hard, he or she could escape from the poverty trap (Chang, 2005: 96).

However, after the IMF crisis, things changed. Poverty and social inequality became a

crucial social agenda. In particular, as neoliberal reshuffling policies were adopted to cope with the economic crisis, poverty became more deepened and structuralized. Relative poverty rates of 40% of the middle level income (based on disposable income) increased from 4.8% in 1996 to 10.5% in 2003 (Kim, M.G., et. als., 2006: 17). And the characteristics of prevalent poverty were also changed. Due to the severe dichotomization of society, just “hard work” cannot guarantee an opportunity for escaping the poverty trap. Thus, recent poverty is characterized as a problem of ‘the working poor’ (Kim, Y.R., 2005).

Working poor households make up 55.7% of the total number of poor households. The average income of households with irregular jobs is only 75% of that with regular jobs, and the debt of irregular job holders is 58% of those with regular jobs. However, the size of redemption of debt of households with irregular jobs is 88% of those with regular jobs. On top of this, the average savings of households with irregular jobs is just over 50% of those with regular jobs (<Table 1>, <Table 2>).

<Table 1> Socioeconomic characteristics by employment types

Employment Types	Average Member of household (person)	Average age of head of household (year)	Average monthly income (10,000 KRW)	Average monthly saving (10,000 KRW)	Debt (10,000 KRW)
Employer	3.45	46.2	235.7	40.7	3,779
Regular job	3.34	43.2	209.7	33.5	3,847
Irregular job	3.20	46.4	157.6	19.0	2,238
The others	2.84	52.6	109.8	9.2	1,352
Unemployment	2.87	58.6	92.7	7.1	2,714
Total	3.23	47.4	178.3	25.5	3,024

Source: KOCER, 2003, “Survey of Poor Household in Seoul”, modified and cited from Chang(2005: 107)

<Table 2> Comparison of monthly expense by household of regular/irregular jobs

(unit: 10,000 KRW, %)

	Buying Food	Dining Out	Transport	Communication	Housing	Medical Care	Culture	Paying Debt	Saving	Total Expenses
Regular (A)	30.4	7.6	16.0	11.2	12.8	7.6	4.5	51.7	33.5	175.3
Irregular (B)	29.9	6.2	14.7	10.0	10.3	7.1	3.6	45.3	19.0	146.1
Ratio (B/A)	98.4	81.6	91.9	89.3	80.5	93.4	80.0	87.6	56.7	83.3

Source: Chang(2005)

This means that households with irregular jobs are trapped by the past and future at the same time; the burden for the redemption of debt and miserable savings (Chang, 2005: 108). Due to such structured attributes of new poverty, it is called a ‘poverty of despair’ (Chang, 2005: 96). It entails multiple deprivations: social exclusion, social distancing (or segregation), cultural and psychological isolation, and so forth (Chang, 2005: 102-103).

The change of population formation makes the cities of South Korea more vulnerable. According to the U.N. standard of age structure, South Korea is categorized as an ‘aging society’, because the proportion of the population over 65-years is 9.5% of the total population as of 2006 and is estimated to reach 32.5% in 2040.

<Table 3> Transition of age structure of population(1970~2040)

-	Population(thousand)				Proportion(%)		
	Total	0~14	15~64 (productive population)	Over 65	0~14	15~64	Over 65

1970	32,241	13,709	17,540	991	42.5	54.4	3.1
1980	38,124	12,951	23,717	1,456	34.0	62.2	3.8
1990	42,869	10,974	29,701	2,195	25.6	69.3	5.1
2000	47,008	9,911	33,702	3,395	21.1	71.7	7.2
2006	48,297	8,996	34,715	4,586	18.6	71.9	9.5
2017	49,332	6,395	36,119	6,818	13.0	73.2	13.8
2018	49,340	6,286	35,979	7,075	12.7	72.9	14.3
2026	49,039	5,721	33,099	10,218	11.7	67.5	20.8
2030	48,635	5,525	31,299	11,811	11.4	64.4	24.3
2040	46,343	4,777	26,525	15,041	10.3	57.2	32.5

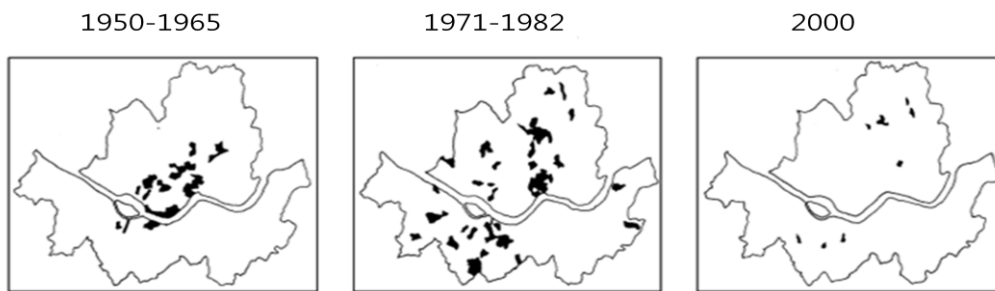
Source: National Statistics Office, 2006, Future Transition of Population

In addition to this, South Korea has the lowest fertility rate among OECD countries (1.26 as of 2007). Also, a considerable portion of the aged population is also faced with the issue of poverty. The absolute poverty rate of the over-65 population was 9.27% (total 4.94%), and the relative poverty rate of this group was 17.35% (total 9.53) in 2002 (Choi, O.G., 2007:5). Owing to the poor conditions of living, the health of the aged population is threatened. From 2003 to 2007, 654 persons died due to malnutrition. Among them, 386 (59%) were over 70 years old (Yonhap News, 2009. 2.25). Elderly people are apt to be located in poor living conditions and need more help from the social welfare system. Therefore, the overall burden of the productive populace (for example, taxation for welfare system, the huge cost of medical care, payment of pensions and so on) will increase tremendously within a very short time.

To make things worse, the unemployment rate of the young generation (age 20-30) was around 7% (approximately 200,000 persons) in 2008. On top of this, the global financial crisis set off from the U.S. cast dark shades on the future of the productive populace in South Korea. Without the provision of proper jobs, they could not play basic roles to support the economic development of society which could be the platform for responding to climate change. In other words, without sufficient economic resources, the stability of urban community or urban governance for adapting to climate change will be also at stake.

### 2.3. Built environment layer

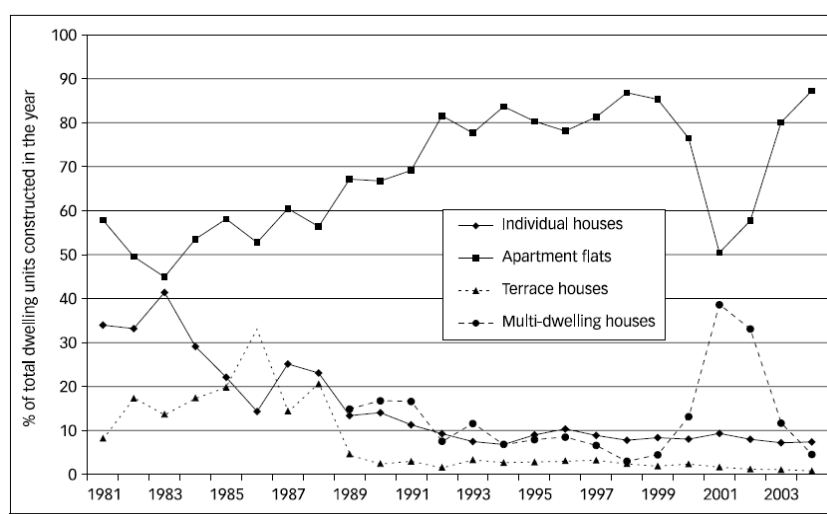
In the course of rapid urbanization, South Korea has experienced large-scale housing construction through unprecedented urban redevelopment projects. About 17% of all types of residential houses built between 1973 and 1995 were the result of the redevelopment of slum and dilapidated neighborhoods (Shin, H.B., 2008: 411). Urban redevelopment was proceeded by profit-led and partnership- (public-private) based approaches. Thus, slums and dilapidated neighborhoods (in Korean “san-dong-ne” means ‘village located on an urban hill’) were under pressure of development due to the lack of locations for apartment construction. Therefore, “san-dong-ne” were demolished and transformed into apartment complexes (<Figure 1>).



<Figure 1> Disappearing slums in Seoul by redevelopment  
 Source: Nam, W.S., 2004: 88

However, the process of demolition of dilapidated neighborhoods was always accompanied by violence. In 1987, UN-Habitat named South Korea as one of two countries that had exercised forced eviction in the most brutal and inhumane manner (Shin, H.B., 2008: 412). As the government had no willingness or capacity to pursue urban development based on public support, the purpose of redevelopment was to provide middle classes with nice dwellings and to generate profits rather than to rehabilitate native residents. The right of a decent life and the living conditions of poor tenants at the sites was not properly considered by the government, landlords, and developers. The tenants of the dilapidated neighborhoods had no ability to buy the redeveloped apartment house despite subsidies from the government, whether provided either in-kind or cash (Kim, S.H., 2009; Shin, 2008). Therefore, there was always serious conflict in the process of redevelopment. Even this year (2009), the tragedy of violent and profit-led urban development was reiterated again at Yongsan, near downtown Seoul; five people including one policeman died owing to brutal eviction procedures.

To make a long story short, residential places for the poor have been redeveloped and provided for the middle class as decent residential places (Kim, S.H., 2009: 5). The dwelling condition of the poor deteriorates more and more, while apartment flats become the dominant landscape of cities. The figure below shows the apartment flat-oriented dwellings provision of South Korea (<Figure 2>).



<Figure 2> National housing construction by dwelling type in South Korea  
 Source: Shin, H.B., 2008: 423

'Apartment-flat-dominant landscape' is accompanied with extensions of roads. Generally

speaking, roads and roofs of buildings are the main impervious covers of cities, which have serious impacts on hydrological circulation and the degradation of water quality. According to a case study of the urban natural disaster of the Ahnyang river in Kyunggi Province, an increase in rainfall and the expansion of impervious cover has made the damage from urban floods greater than before (Lee, Y.Y. et als, 2004). Since the hydrological circulation is interrupted due to the increase of impervious cover, the vulnerability of the city is also increased. When it comes to the issue of the distribution of national revenue, huge amounts of the budget is used for the construction of roads. From FY 2000 to FY 2005, approximately 105.3 trillion KWR (around 105 billion USD) of revenue has been used for construction and improvement of roads (Jung, K.M., 2008). Considering the size of the annual national revenue is around 250 billion USD in FY 2009, this is a terrific amount. The total extension of roads in 2004 was 100,278 Km and the social cost from traffic congestion was 4.4% of GDP of 2005. Therefore, the hydrological circulation of urban areas of South Korea would be more threatened.

#### 2.4. Ecological layer

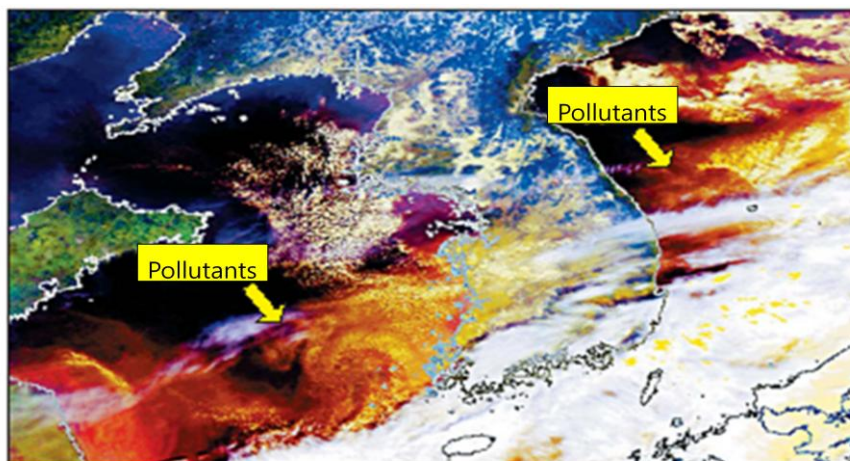
As the modernization and urbanization of South Korea was environment-blind development, ecological layers of urban security can be unsustainable. In spite of strong air quality control regulations of government, the air quality (NO<sub>2</sub> and PM<sub>10</sub>) of cities has been degraded due to an increase in demand for automobiles and industrial activities.

<Table 4> Annual Air quality of South Korea

		`99	`00	`01	`02	`03	`04
NO <sub>2</sub> (ppm)	SMA	0.031	0.030	0.032	0.031	0.034	0.033
	Total	0.023	0.024	0.025	0.023	0.024	0.024
PM <sub>10</sub> (µg/m <sup>3</sup> )	SMA	59	59	66	69	66	63
	Total	51	53	58	61	56	58

Source: Ministry of Environment, 2005, *Annals of Air Quality*

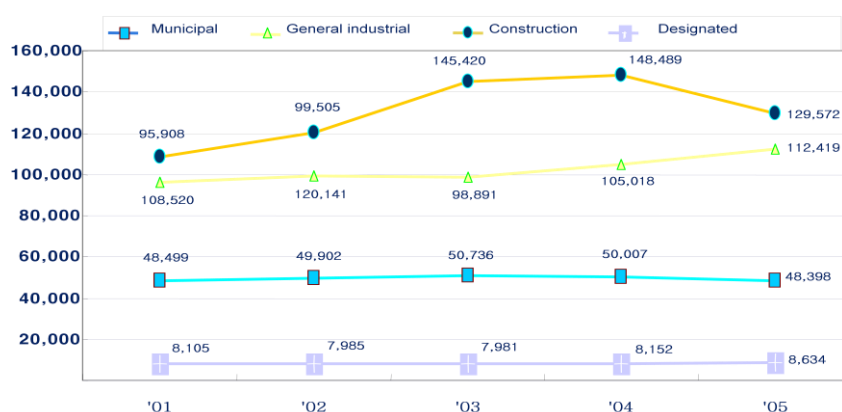
Moreover, yellow dust or sand storms from China and Mongolia have aggravated the air quality (PM<sub>10</sub> and PM 2.5) of South Korea throughout the year.



<Figure 3> Sand Strom over Korean Peninsula

Source: Chosun Newspaper, 2007.1.18

In South Korea, waste is roughly classified into two categories, according to its source of origin: municipal waste from households and industrial waste from business sites or factories of large scale (generation of waste above 300kg/day). Industrial waste is further divided into two categories: 'general industrial waste' which consists of slag, ash, dust, and construction waste, and 'designated waste' which consists of toxic wastes such as waste acid, waste alkali, waste oil, waste organic solvent and so on. To effectively address the waste issue, it is important to reduce waste generation and recycle unavoidable waste as much as possible. To that end, the Korean government is focusing on minimizing waste generation through regulating the use of disposable products and the generation of packaging material waste, and implementing the Extended Producer Responsibility policy. Since 1993, the total amount of waste generation, in particular, construction waste, has steadily increased although the recycling rate of construction waste is quite high (83.4% in 2002). The trend of waste generation from 2001 to 2005 is summarized in <figure 4>.



<Figure 4> Trend of waste generation of South Korea

Source: Ministry of Environment (2007)

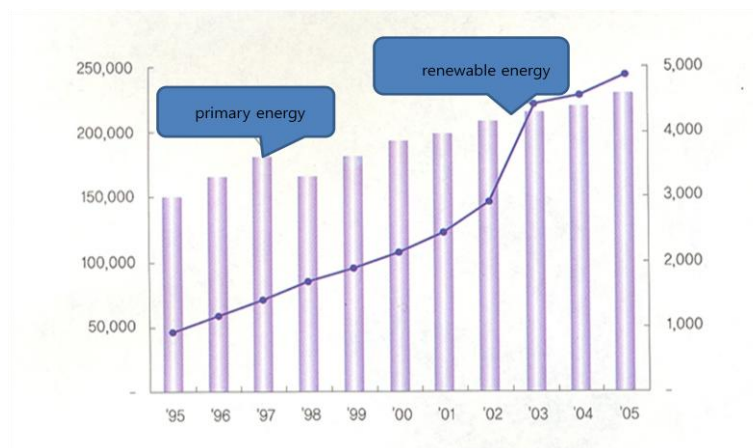
Even though 97% of primary energy consumed is imported from abroad, the increase rate of energy consumption of South Korea is still high when compared to the average of OECD countries. (<Table 3>)

<Table 5> Energy Consumption of South Korea

		2000	2001	2002	2003	2004
Consumption of primary energy (1000 TOE)		192,887	198,409	208,636	215,067	220,238
Per capita total energy consumption(TOE)		4.10	4.19	4.38	4.49	4.58
Energy consumption per GDP(2000=100)		100.0	99.1	97.4	97.4	95.3
Energy consumption Increase rate(%)	South Korea	5.87	2.51	4.65	3.32	2.55
	Average OECD	2.10	-0.60	0.61	1.02	1.64

Source: GreenKorea(2006)

Nuclear power accounted for 38.2% of total electricity generation and 14.8% of primary energy in 2004 (Green Korea 2006). As of 2006, the total provision of primary energy was 230 million TOE and renewable energy was 4.9 million TOE (2.13%).



<Figure 5> Provision of primary and renewable energy

Source: Ministry of Commerce, Industry & Energy, 2007, Annals of Energy Statistics

The GHG emission increase rate from 2000 to 2005 was 12.1% and without the reduction of GHG, it is to be expected to increase to 37.7 percent, compared with 2005. Due to the heavy burden of investment and reluctance from industry sectors, South Korea does not have a national target goal for GHG reduction.

<Table 6> GHG emission indices of South Korea

Emission related Indices	South Korea	Rank	Reference
Increase rate ('00~'05)	12.1%	4	No.1 Luxemburg (33.3)
Emission volume	590 M.ton/ Year	9	No.1 USA (70.7) No.2 China (47.3)
Emission per GDP	0.62 ton/1000 USD	8	No.1 Australia (0.86), No.4 USA (0.66)
Per Capita Emission	12.24 ton/capita	13	No.1 Luxemburg (27.9)

Source: Shin,E.S.(2009)

However, each local government is preparing for climate change according to its governance capacities. For example, Seoul city set up a GHG reduction target (25% reduction in 2020 based on emission volume of 1990); Kwangju city operates a 'Carbon Bank System' through cooperation with private banks, and Ulsan city is enthusiastic to pursue many CDM projects.

### 3. Response of government to climate change

Even though South Korea is an OECD country, the status of South Korea in the Convention of Climate Change has been one of a non-Annex 1 country. Thus, the strategy of South Korea facing the convention was quite negative: avoid a fixed target of GHG reduction. However, in the course of preparing a post-2012 system, international pressure on South Korea regarding setting up fixed targets of GHG reduction is getting stronger. The negative strategy does not seem to work anymore.

At the ceremony of the 60<sup>th</sup> anniversary of liberation day in 2008, President Lee Myung Bak announced that "Low Carbon, Green Growth" should be a national goal for the next 60 years. The key point of this goal is to utilize environment for further growth and to prepare for climate change through green technological breakthroughs.



**<Table 7> Green Growth Vision in Comprehensive National Energy Plan (2008-2030)**

Vision	Index	2006	2030
Transition to energy independent society	Independent development rate	3.2%	40%
	Portion of renewable energy	2.2%	11%
Transition to low energy consuming society	Energy Intensity	0.347	0.185
Transition to oil free society	Oil dependency	43.6	33%
Energy welfare	Portion of energy poverty	7.8%	0%
New growth engine and job creation	Level of energy technology	60% of advanced countries	Leading level

Source: Lee, S.H(2008)

Following this announcement, the government proclaimed its “Green New Deal” plan which contains many projects: expanding mass transit and railroads (jobs created: 138,067), energy conservation (170,702), fuel efficient vehicles and clean energy (14,348), environmentally friendly living space (10,789), four major rivers restoration (199,960), forest restoration (133,630), water resource management (small and midsize dams, 16,132), resource recycling (including fuel from waste, 16,196), national green information service (GIS) and infrastructure (3,120). It is expected that 149,000 jobs will be created in 2009, mainly in construction (UNEP, 2009).

Despite the audacious plan of the Green New Deal, there are severe criticisms about the feasibility of the plan regarding its anti-environmental feature and lack of governance. In terms of feasibility, there is no concrete plan for procuring huge amounts of budget for pursuing the plan. In particular, the economy of South Korea is about to experience an unprecedented crisis. How can the Korean government secure enough money for implementing the planned projects? Even though the new strategy is called ‘green,’ contradiction exists. According to the new strategy, 14 more nuclear power plants will be constructed (accounting for 60% of South Korea’s power generation) to cope with climate change.<sup>1</sup> As nuclear power plants do not emit GHG, it can be called low carbon energy. However, considering the environmental impact through the life cycle of nuclear power, it cannot be called ‘green.’ And among projects of the green new deal, the four major rivers restoration is suspected to be the preparation stage for building the ‘Grand Canal,’ which was planned to connect the two main rivers of South Korea for logistical navigation but was cancelled after heated controversy nationwide. The most serious shortcoming of the plan is that it is pursued without sufficient social consensus. To make a low carbon society, active participation of multi-stakeholders and cooperation of people is the most important element. However, the stance of the government is quite authoritarian and even hasty. Moreover, adaptation of climate change is not a main focus of the plan.

In terms of adaptation, the government of South Korea published its ‘National Comprehensive Plan for Adaptation to Climate Change’ (2008.12.24). The vision of the plan is to establish a safe society and support green growth by climate change adaptation. There are short-term targets and long-term targets of the plan. The short-term target is to strengthen the comprehensive and systematic capacity of adaptation to climate change (2008~2012). For this target, making a vulnerability map of Korea and achieving a level of forecasting and monitoring technology 70% of that of advanced countries are suggested as sub-targets. The long-term target is to reduce the risk of climate change and realize the

<sup>1</sup> According to 4<sup>th</sup> national comprehensive policies for climate change, South Korean government is supposed to ask the parties of UNFCCC to recognize the records of reducing GHG through nuclear power plant.

opportunities from climate change (2008~2030). For this target, decreasing damage from climate-related disasters by 10% of past levels (1996~2005) and achieving production from adaptation action equivalent to 1% of GDP are suggested as sub-targets. For these goals, five strategies are also provided: establish a scientific and comprehensive evaluation system for climate change adaptation; prepare cost-effective and sustainable adaptation programs; construct domestic partnerships for enhancing capacity and awareness to adaptation; secure global leadership through international cooperation and contribution; and establish an institutional base for strengthening the implementation of adaptation action (Ministry of Environment and other ministries of South Korea, 2008). However, the budget for adaptation is only 0.1% of the total revenue for climate change (2005~2007). Therefore, the feasibility of the plan is still questionable.

#### **4. Tentative conclusion: Multiple vulnerabilities of cities in South Korea**

Based on the above brief explanation about the multiple layers of urban security in South Korea and the response of government to climate change, it can be said that many cities in South Korea are faced with multiple vulnerabilities; i.e., facing combined and overlapping risks that arise from human institutions (Hayes, 2008: 19).

Political conservatism has gained strength after the conservative party seized political power. Under such circumstances, various political opportunities or ideas for responding to climate change is restricted. For example, suggestions and unharnessed discussion about alternative economic systems to cope with tragic consequences from neoliberal globalization might be prohibited as threatening social security. Also, the military concept of security can dominate over the concept of environmental security. Thus, when it comes to adaptation against climate change, it adds an undesirable impact on the resilient capacity of cities of South Korea.

The severe dichotomization of society after the economic crisis and the unstable population structure also makes cities of South Korea vulnerable to climate change. Poverty and aged population issues are big challenges to social security. That is, production in economy and reproduction in society are in trouble. People become too busy to build urban communities as they have to survive in a competitive market. Thus, urban governance for adapting to climate change does not seem to work properly. In particular, as the brutal and inhumane manner of urban redevelopment has not changed despite the criticism from UN-Habitat in 1987, the possibility of making good urban governance for climate change seems to be small.

Expansion of the impervious cover of cities and apartment-flat-centered urban development imperils the ecological security of cities, which is already endangered in many ways: deteriorated air quality, often and strong sand storms, increased waste generation, high energy consumption rate, high increase rate of GHG, and so forth. The strategy of “Low carbon, Green growth” initiated by the government has many flaws, as mentioned above. How can we survive the multiple vulnerabilities we are facing? How can civil society take initiative in enhancing the capacity for resilience of the cities?

NGOs in South Korea have experienced several victories in the struggle for democratization and even in environmental protection. However, the issues of climate change are too professional, complicated, and technical for staffs and members of NGOs to handle. It does not mean that they cannot take initiative in the field of adaptation to climate change. Recognizing the limitation of capacity of civil society, and in particular NGOs, the initiative of civil society regarding adaptation to climate change should focus on education issues first. To do this, the capacity of NGOs should be raised. And as a possible option for enhancing the capacity of NGOs, establishing NPOs focusing on adaptation issues could be considered.

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