

# Population Growth, Environment and Sustainable Development in Korea

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## I. Introduction

Korea has witnessed a series of population change since the beginning of the 20th century. The first sign of change was on mortality. The crude death rate started to drop from around 34 per thousand in 1910s. Since then, it showed a consistent pattern of decline until the Korean war period, 1950 - 53. On the other hand, the fertility did not show any significant changes until the beginning of 1960s. The gap between fertility and mortality had increased over time, resulting in unprecedently rapid population growth.

Before the fertility transition began, Korea has been an agrarian country. Agriculture has taken the major share of Korean industry until the beginning of the 1960s. During the period of 1953 - 55, agriculture took 50.4 percent of the Gross Domestic Product (Kim, 1987a). The share of agriculture in the GDP sharply declined

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from 45.2 percent for the period of 1960 - 62 to 29.5 percent for the period of 1970 - 72. It decreased by 15 percent in only ten years. The rapid economic growth started since 1962 when Korean government launched the first five - year economic development plan.

Due to the continuous adoption of economic development plans, Korea has experienced very rapid processes of both industrialization and urbanization. Before the first five - year economic development plan, both urbanization rate and GNP per capita were very low. The proportion of the population living in cities was only 28 percent in 1961. Since then, the proportion has continuously increased, reaching 74 percent in 1970. GNP per capita was as low as US\$ 82 in 1961. But within 30 years, it increased to US\$ 5,569 in 1990.

During the periods of several five - year economic development plans, most of the economic growth has been due to the growth of the manufacturing industry(Kim, 1991). In 1961, the proportion of the manufacturing industry in GNP was only 13.4 percent. By 1990, however, it was increased to 29.2 percent. Before industrialization and urbanization, Korea was free from any kind of pollution. But since the acceleration of both industrialization and urbanization, the country has continuously been contaminated with pollution. The population growth in conjunction with urbanization and industrialization has contributed to the deterioration of environment, especially in urban areas.

Population is a very important factor in human life. Ecologically, optimal number of population is considered as an opportunity for the development of human society; however, overpopulation means a crisis for the survival of the human beings. Population would thus be the most important factor affecting the human environment. Duncan(1961) analyzed environmental problems with ecological complex system. He counted ecosystem as an interaction process of population(P), organization(O), environment(E) and technology(T). On the basis of Duncan's POET model, I propose the interrelationships of population growth, urbanization, industrialization and environmental pollution as Figure 1.

Figure 1. Diagrams of Population Growth, Urbanization, Industrialization and Environmental Pollution

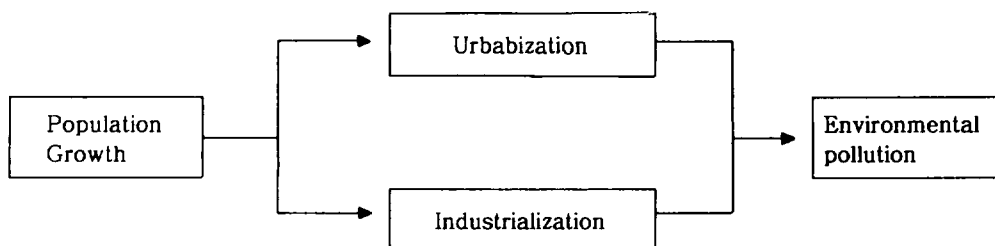


Figure 1 explains the path model of the effects of population growth on the environmental pollution. Population itself is wasting resources and thus directly affecting environmental pollution. In addition, population growth is an indirect cause of environmental pollution by way of initiating urbanization. Population growth is also indirectly affecting environment by way of causing industrialization. Finally, there is an interrelationship between urbanization and industrialization in influencing environmental pollution.

Deterioration of environment would pose serious obstacles to the sustainable development of human society. Development is generally accepted to be a process that attempts to improve the living conditions of people. Environment may be considered to be an integral part of development since any impact on man's environment influences his state of wellbeing or welfare (Bartelmus, 1986). In other words, environment and development are so intricately linked together that separate approaches to either environment or developmental problems are piecemeal at best.

This paper describes the process of population growth, urbanization and industrial development and their impacts on environmental problems. Besides, this paper deals with the policies of the Korean government in protecting the environment. Government's policies include the programs of urban and rural development in conjunction with the population control and population redistribution. Finally, this paper describes the activities of the non-governmental organizations which seek to protect the environment and educate the public of the importance of the environment for the sustainable development.

## II. Demographic Changes

During the period of 1955-60, Korean population grew at the rate of approximately 3 percent annually. After the beginning of the 1960s, however, South Korea experienced a major demographic transition, from a rapidly growing population to a moderately growing one. The annual growth rate of population has continuously declined over time. Table 1 shows that the record high growth rate of 3.0 percent declined to 2.0 percent in 1970, then to 0.93 percent in 1990. The rapid process of demographic transition since 1960s was facilitated by the joint effects of rapid socioeconomic development and full-scale adoption of family planning programs, which were established in 1962. Despite the continuous decline of growth rate, however, the population has consistently increased and its density has worsened. The population of Korea increased from 25.0 million in 1960 to 32.2 million in 1970, then to 42.9 million in 1990. Population density increased from 254 in 1960 to 328 in 1970, then to 432 in 1990.

Table 1. Trends of Korean Population, 1960 - 1990

Year	Population (thousand)	Annual rate of (%) population growth	Population density	Urbanization rate (%)
1960	25,012	3.00	254	28.0
1965	29,436	2.55	299	33.5
1970	32,241	2.00	328	41.1
1975	35,281	1.70	357	48.3
1980	38,124	1.57	385	57.2
1985	40,806	0.99	412	65.4
1990	42,869	0.93	432	74.4

Source : Korea Statistical Yearbook, each year

During the period of demographic transition, Korea experienced a rapid urbanization process as well. In 1960, only 28 percent of the population lived in cities. The urbanization rate increased to 41.1 percent in 1970, then to 57.2 in 1980. During this period, urban areas absorbed almost 90 percent of Korea's population increase (Kim, 1987a). Much of this growth, however, has been concentrated in a few

large metropolitan areas. The urbanization rate has consistently increased and reached 74.4 percent in 1990. According to the 1990 Korean census, the proportion of Seoul, the capital, was 24.4 percent. With surrounding settlements included, the Seoul metropolitan area contains 42.8 percent of the total population(Choi *et al.*, 1993).

Since the 1960s Seoul has been showcase for the urbanization movement in Korea. Internal migration was dominated by the centripetal movement of population towards Seoul(ESCAP, 1980). During the 1960-66 intercensus period, the population of Seoul increased by 46 percent, with 66 percent of this growth due to net migration. During this period, Seoul absorbed 52 percent of the total urban population growth, 34 percent of the nations' population increase and 69 percent of the total net migration gain for all urban areas(Kim, 1987a). During the 1966-70 intercensus period, the annual growth rate of Seoul, 9.4 percent was faster than the 6.5 percent for the previous intercensus period. Seoul took 77 percent of the total population increase in Korea.

In contrast to the rapid increase of urban population, the rural population growth rate has declined over time. During the period of 1966-70, the rural population growth rate decreased to -2.0 percent from the previous 1.3 percent for the period of 1960-66. As a result, for the first time in the recent history of Korea, an absolute decrease in the size of rural population was observed.

The loss of rural population between 1966 and 1970 amounting to slightly more than 1.5 million is totally due to the heavy out-migration from rural areas. The heavy out-migration from rural areas is believed to be closely related to the rapid industrialization(Kim, 1995). This is because during the period of rapid industrialization factories in urban areas required a lot of new young workers from rural areas. Such a heavy out-migration, especially of working age population, has resulted not only in a sharp rise in the rate of urban population growth but also in a deepening gap of development between urban and rural areas(Choi *et al.*, 1993).

### III. Socioeconomic Development

During the period of the first five-year economic plan, 1962-67, the Gross National Product(GNP) grew at an annual rate of 7.0 percent. The GNP growth for the next five-year economic plan was even higher, 11.4 percent. According to Table 2, GNP per capita was only US\$ 79 in 1960, but it has drastically increased since then. The GNP per capita increased from US\$ 242 in 1970 to US\$ 1,592 in 1980, then to US\$ 5,569 in 1990.

The rapid growth of Korean economy was mainly due to the accelerated growth of the industrial sector. Table 2 shows that the portion of the industrial sector was only 14.4 percent in 1960. The portion of the the industrial sector has consistently increased, whereas that of the agriculture has continuously declined over time. The portion of the industrial sector increased from 22.3 percent in 1970 to 30.2 percent in 1980. Since 1980, however, the portion of the industrial sector has not changed much. In the industry, manufacturing sector has taken the most important role in the accelerated growth(Kim, 1987a).

Throughout the 1960s, the Korean government's economic policies aimed at the promotion of export-oriented industrialization on the strength of the support of labor-intensive manufacturing enterprises(Kim, 1990).

Table 2. Trends of Economic Indicators in Korea, 1960 - 1990

Year	GNP per capita (\$)	Composition of GNP (%)		
		Agriculture	Industry	Services
1960	79	33.7	14.4	51.9
1965	114	37.6	19.9	42.5
1970	242	26.8	22.3	50.9
1975	594	24.7	27.5	47.8
1980	1,592	14.4	30.2	55.4
1985	2,194	13.5	30.7	55.8
1990	5,569	9.0	29.4	61.6

Source : Korea Statistical Yearbook, each year

The manufacturing sector has led the industrial expansion during most of the 30 year period of economic development. In the early stages of industrialization, the manufacturing sector consisted mostly of labor-intensive light industries like textiles, garments, plywoods, whigs, etc. From the beginning of the 1980s, however, Korean government began to promote capital-intensive heavy and chemical industries like machinery, transport equipment, metal, and electronic and chemical products. Thus, the proportion of heavy and chemical industry in total manufacturing output rose from 28.6 percent in 1965 to 50 percent in 1980, then to 63.5 percent in 1991 (Yang, 1995).

During the periods of the first and second five-year economic development plans extending from 1962 to 1971, Korean economy grew at an annual rate of slightly less than 10 percent. However, the growth of agriculture lagged compared to that of non-agricultural sectors. For the same period, agriculture grew at an annual rate of 3.7 percent compared to 17.9 percent rate of growth in the mining and manufacturing sectors (Ban, 1977). Accordingly, the relative income level of peasants dropped. Luther (1979) argues that a farm household earned about 71 percent of an urban household's wages in 1962 but the figure declined to 61 percent in 1970. This could be one of the many factors which brought about the massive influx of rural peasants into big cities, especially into Seoul. Cities have grown much faster than their capacities to absorb additional population from rural areas.

The mass influx of rural population into urban areas resulted in housing shortages, congestion, unemployment and poverty in these areas. Rapid industrial development has actually raised the standard of living on the whole, but it has brought about serious environmental problems like air and water pollution, especially in urban areas. The problems due to the rapid industrial development are not confined in the urban areas. However, the mass influx of young migrants to urban areas has resulted in the severe problems of poverty in the rural areas mainly because of labor shortage.

## IV. Environmental Deterioration and Sustainable Development

As rapid urbanization and industrialization proceeded, Korea had experienced drastic changes in number and volume of environment-related factors. Table 3 compares some of the environment-related factors in Korea between 1961 and 1985. In 1961, the number of factories having more than five employees was 15,204, but it increased to 44,037 in 1985. The number of automobiles in 1961 was only 29,234, but in 1985 it increased to 1,113,430, which is 38.1 times of that in 1961.

The use of chemical materials has also continuously increased over time. The use volume of chemical materials was 4.1 million tons in 1961, but it increased to 6.8 million tons in 1985. The use volume of both chemical fertilizer and agricultural chemicals has drastically increased from 1961 to 1985 by 3.1 times and 10.1 times, respectively. The volume of wastes in cities increased from 26,381 tons per day in 1978 to 61,072 tons per day in 1985. The volume of industrial wastes increased from 13,130 tons per day in 1981 to 33,349 tons per day in 1985.

Among these items, automobile has demonstrated the most drastic changing pattern. The number of automobiles increased to 6.27 million in 1993, which is 214.6 times of that in 1961 (Ministry of Environment, 1994). In Korea, automobile is the most important factor affecting air pollution. The proportion of the air pollution influenced by exhaust gas from automobiles is responsible for 37.8 percent of the total air pollution (Ministry of Environment 1994).

Table 3. Comparison of Environment-Related Factors in Korea between 1961 and 1985

Environment-related factors	1961 (A)	1985 (B)	B/A
Number of factories (over 5 people)	15,204	44,037	2.9
Number of automobiles	29,234	1,113,430	38.1
Use volume of chemical materials (ton)	4,132,634	6,799,959	1.7
Use volume of agricultural chemicals (ton)	1,807	18,047	10.1
Use volume of chemical fertilizer (ton)	261,995	803,000	3.1
Volume of household wastes in cities (ton/day)	26,831 (1978)	61,072	2.3
Volume of industrial wastes (ton/day)	13,130 (1981)	33,349	2.5

Source : Ministry of Law, white Paper on Crime, 1987.



## (1) Air Pollution

Two factory workers in Seoul died of pollution-related health problem in May of 1991. These deaths prompted a series of demonstrations not only by factory workers but also by several anti-pollution organizations.

Table 4 shows the trends of levels of SO<sub>2</sub>(sulphur dioxide) in major cities in Korea. On the whole, the levels of SO<sub>2</sub> in Seoul have been much higher than those in other cities. In cases of Seoul and Pusan(the second largest city in Korea), the levels have fluctuated until the end of 1980s but they have consistently declined since 1990. The decline pattern since 1990 seems to be due to the fact that the supply of gasoline with low sulphur was enforced by the law in these cities. In Ulsan and Daegu, the levels have continuously fluctuated. In Kwangju, however, the levels drastically increased from 0.009ppm in 1980 to 0.03ppm in 1992. In Korea, the tolerance limit of SO<sub>2</sub> was 0.05ppm by 1993, but it was reset to 0.03ppm on December 31 of 1993. The levels of SO<sub>2</sub> have been mostly over the tolerance limit in most of major cities.

Table 4. Trends of Levels of SO<sub>2</sub> in Major Cities, 1980 - 1992

Cities	1980	1982	1984	1986	1988	1989	1990	1991	1992
Seoul	0.094	0.057	0.066	0.054	0.062	0.056	0.051	0.043	0.035
Pusan	0.058	0.065	0.050	0.042	0.044	0.047	0.039	0.038	0.033
Ulsan	0.053	0.039	0.024	0.032	0.028	0.029	0.031	0.038	0.031
Daegu	0.038	0.039	0.040	0.043	0.052	0.048	0.041	0.041	0.040
Kwanju	0.009	0.024	0.026	0.032	0.028	0.029	0.031	0.038	0.031

Source : Koo, 1994, p. 45.

Then, let's look more closely at the trends of levels of air pollution in Seoul since the indexes of air pollution in Seoul have been worse than those in other big cities. Table 5 indicates the trends of air pollution in Seoul. Since 1980, SO<sub>2</sub> has been consistently over the tolerance limit. Dust(TSP) has also been over the tolerance limit. But during the Olympic period in 1988, the average levels of SO<sub>2</sub> and dust were much lower than the tolerance limit. At that time the Korean

government forced many pollution-making shops such as public baths to close for two weeks. This was the main reason why the levels of SO<sub>2</sub> and dust sharply dropped during the Olympic period. The level of NO<sub>2</sub> (Nitrogen dioxide) has steadily increased. It was only 0.018 ppm in 1975, but in 1990 it increased to 0.068 ppm, which far surpasses the tolerance limit.

The level of CO (carbon monoxide) was very high in 1975, but since then it has turned back to the normal condition. The level of HC (hydrogen carbon) was a little lower than the tolerance limit in 1980, but in 1985 it increased to 4.13 ppm, which is greater than the tolerance limit. Since then, no data on this item have been available. The situation of oxidants in 1990 was very bad. The level (0.102 ppm) was five times greater than the tolerance limit.

The levels of air pollution mentioned above are the average scores for the year. But the level of the pollution fluctuates depending on the time and the place. The air pollution situation gets worse during the winter. In Korea, most people in households use coal briquets for heating and cooking. In recent years, many people have changed their heating system from coal briquets to gas boilers. But the use of coal briquets is still the most popular means of heating in Korea, especially in poor communities (Kim, 1994).

Table 5. Trends of the Levels of Air Pollution in Seoul, 1975 - 1990

Item	Tolerance limit (Korean Standard)	1975	1980	1985	1988 (Olympic period)	1990
SO <sub>2</sub>	0.05ppm <sup>(1)</sup>	-	0.094	0.056	0.015	0.051
Dust (TSP)	150Ug/m <sup>3</sup>	-	161	200	63	150
NO <sub>2</sub>	0.05 ppm	0.018	0.03	0.034	-	0.030
CO	8ppm/(month)	8.5	2.8	2.7	-	2.6
HC	3ppm/(year)	-	2.4	4.3	-	-
Oxidants	0.02ppm/(year)	0.013	-	-	-	0.102

Source : City of Seoul (1976, 1990a, 1990b).

(1) The tolerance limit of SO<sub>2</sub> was reset to 0.03 ppm on December 31 of 1993.

A survey of the living conditions of the lower class people in Seoul (Chun et al., 1989) indicates that 41.7% of the poor in Seoul use pure coal briquets for heating and 57% of the people in poor communities use boilers using coal briquets for heating. The remainder (1.3%) use other methods (gas boiler, oil boiler, etc).

## (2) Water Pollution

As industrialization proceeded the water quality in Korea had become a serious problem. In the course of the industrialization, both the number of factories and the volume of industrial waste water have greatly increased. Table 6 shows that the number of factories that produce industrial waste water was 3,984 in 1980, but it increased to 13,504 in 1990. The volume of industrial waste water was 1.9 million m<sup>3</sup>/day in 1980, but it increased to 7.3 million m<sup>3</sup>/day in 1990, which is almost 4 times of that in 1980.

The volume of waste water from factories is the most important factor affecting water pollution in the industrial complex areas. The volume of the industrial waste water in Pusan (which has a big industrial complex) is about 6 times of that in Seoul, although the population size is one-third of that of Seoul. In case of Seoul, however, the most important factor influencing water pollution seems to be the population size. According to a study (Cho, 1990), the drained water from residences composes 64.3% of the polluted water in Seoul. The next important factor in polluting the water is the waste water from factories, which composes 35.2% of the polluted water.

Another important factor influencing water pollution is the drainage from livestock composing only 0.5% of the polluted water. But in terms of the volume of chemical materials, it composes 36.3% of the polluted water. The pollution of upstream water due to the waste from the livestock and agricultural chemicals is also a serious problem. At present, many inhabitants in Seoul do not trust the quality of the tap water in spite of the assertion by the government that it is safe (Kim, 1991). Most of Seoul residents drink only boiled water. The proportion of people who buy clean water has steadily increased.

Table 6. Trends of the Number of Factories That Produce Industrial Waste Water and the Volume of Industrial Waste Water, 1980 - 90

(Unit : 1,000m<sup>3</sup>/day)

Year	1980	'81	'82	'83	'84	'85	'86	'87	'88	'89	'90
Number of factories	3,984	4,720	5,671	5,924	6,422	7,375	7,900	8,570	9,522	11,203	13,504
Volume of industrial Wastewater	1,962	2,209	2,760	2,538	2,792	3,109	4,487	4,603	5,783	6,497	7,280

Source : Ministry of Environment (1991).

### (3) Obstacles to sustainable development

The rapid urbanization and industrialization in Korea since 1960s have to some extent contributed to the economic growth and welfare. However, environmental deterioration due to the rapid processes of both urbanization and industrialization would create serious obstacles to the sustainable development in the future.

Environmental deterioration in Korea so far has brought about serious consequences as follows: Most residents in big cities complain about bad air quality and respiratory disorder; few people drink tap water directly; many industrial workers and farmers are poisoned by toxic materials such as mercury, cadmium, lead, copper, arsenic and phenol; fish in fresh water are often reported to be dead or deformed; coastal waters are contaminated to such an extent that inshore fishery, though once having flourished, especially in industrial complex areas is now almost gone; also, many residents in industrial complex areas had to leave their towns because of severe pollution.

The overall goal of development is to improve the quality of life or welfare for present and future generations. However, continuous development focussing on excessive human exploitation of finite natural resources and addition of a large amount of pollutants to the environment threaten to exceed the carrying capacity of the ecosystem and to do permanent damage to ecological balance (Yang, 1995). Thus, implementation mechanisms for ecologically sound and sustainable development should be employed.

## V. Implementation Mechanisms for Sustainable Development

Sustainable development is possible through joint efforts of protection of the environment and economic development. Economic development should thus be based on the ecological sustainability (Kim, Y.P., 1995). In this sense, the role of government is indispensable to the implementation of sustainable development. The role of government is necessary not only for the protection of the environment itself but also for controlling population congestion in cities, which constitutes a major cause of environmental pollution. However, the role of Korean government in protecting the environment was limited. In Korea, activities of non-government organizations (NGOs) have contributed a lot to the protection of the environment. This chapter describes the policies of the government and activities of NGOs for protecting the environment. Further, this chapter deals with population redistribution policies, which would be helpful for the sustainable development in both urban and rural areas.

### 1. Environmental policies and Activities

#### (1) Environmental Policies of the Korean Government.

The first anti-pollution law in Korea was established in 1963, one year after the initiation of the first five-year economic development plan. At that time there was no immediate worry about pollution at all. So, the law had not been enforced for a long period of time.

During the regime of the late president Park (1962-1979), environmental activities were strictly prohibited and thus environmentalists were harshly treated. Those who publicized pollution issues were interrogated or sometimes forced to leave their positions. Since public demonstrations were not allowed, victims owing to the pollution had to quietly negotiate with the industrial firms. The government used to mediate the negotiations, and most of the negotiations resulted in favoring the industrial firms.

As a positive response to environmental problems, Korean government initiated the 'Environment protection Act' in 1977. Korean government also established the Office of Environment in 1980. As industrialization and urbanization have accelerated, however, the government has realized the seriousness of environmental problems. The Office of Environment was promoted to the Ministry of Environment in 1990, which signalled significant changes in the government's environmental policy.

At the same time, the old Environment Protection Act of 1977 was replaced by a number of new and more specific environmental laws including the Basic Environmental policy Act, the Air Environment Preservation Act, the Water Environment Preservation Act, the Noise and Vibration Control Act, the Toxic Chemical Substances Control Act, and the Environmental Pollution Damage Dispute Coordination Act (Yang et al., 1995). Then, the national Environment Preservation Act and the Environment Enhancement Act were enacted in 1991, and the Resource Conservation and Recycling Promotion Act were employed in 1992. Yang (1995) summarizes major environmental policies of the government in the early 1990s as follows.

First, the environmental standards for air and water quality as well as for air pollutants and waste water from power plants and industrial facilities were gradually reinforced. Second, in order to improve water quality, more sewage water treatment facilities were constructed, to increase the treatment rate from 35 percent in 1992 to 65 percent by 1996. Third, measures for improving air quality were planned: that is, the sulfur content in diesel fuel was reduced from 0.4 percent to 0.1 percent and leaded gas was no longer to be sold. Fourth, in order to facilitate recycling thereby reducing the volume of wastes, waste separation policy was enforced by law from January 1, 1995. Fifth, industrial communities were encouraged to invest in the development of pollution abatement facilities and clean technologies. In 1992, the Eco-Mark program for industrial problems was initiated by the Ministry of Environment. Sixth, the Ministry of Environment began to improve its own policy-coordinating function, through Environmental Impact Assessment procedure coordinating authority. Seventh, the government has decided to participate more actively in many international environmental conventions such as the Montreal Pro-

Protocol and the Climate Change Convention.

Despite the efforts of the government, the environment in Korea has not been improved. It is because the governmental policies have been too weak to keep up with rapid industrialization. Another factor to be pointed out is that public participation or demonstration for the protection of the environment have been strongly controlled by the government at least until 1987. Before the declaration of democratization in 1987, the government has identified the environmental movement as an anti-governmental movement or anti-establishmental activity, thus the environmental organizations were considered dangerous. This labelling is still going on in some sense. Under this circumstance, the general public has tended not to join environmental organizations, although they recognize the necessity of the environmental movement.

## (2) Activities of Non-Government Organizations

Public participation in protecting the environment in Korea has been implicitly permitted after the declaration of democratization in 1987. Since then, numerous non-government organizations (NGOs) have been established.

The NGOs have provided many programs for protecting the environment such as environmental education, environmental monitoring, resource recycling, and many forms of public campaigns. They have been the major pressure groups for urging the government to be more concerned about the environment. Due to the dynamic activities of the NGOs, the government has eventually tried to enact stricter environmental regulations, to improve some environmental facilities, and to release more environment-related information to the public. Then, what are the characteristics of the NGOs and their roles and activities in protecting the environment?

Milbrath (1984) argues that in the U.S. the environmental movement has undergone some transformation with time. In Korea, however, the environmental movement directed by the NGOs has not been transformed with time as in the case of the U.S. Most of the non-government environmental organizations have appeared almost

at the same time. The NGOs in Korea are categorized into two groups: one is government-registered NGOs (registered with the Ministry of Environment) and the other one is independent NGOs. At present there are about 45 each of government-registered NGOs and independent NGOs (Kim, J. 1991). The main function of the government-registered NGOs has been that of conservation movement, whereas that of the independent NGOs has been basically an environmental protection movement.

The government-registered NGOs were mostly organized by the government and are thus financially supported by the government. The main activities of these organizations are environmental education, campaign for cleaning up litters in streets and parks, doing research sponsored by the government of industries, coordination among industries in dealing with environmental problems, and promoting friendships among experts in environment (Kim, J. 1991). They rarely engage in anti-pollution activities or opposing environmental policies of the government. Instead, they support environmental policies of the government. Thus, their activities sometimes failed in attracting the public attention and trust.

Independent NGOs are classified into several groups depending on the sociopolitical characteristics of the organizations (Koo, 1991). Among the 45 organizations, 33 organizations were established after 1987. The other 12 organizations were mostly religious groups, women's groups, or consumer groups, which later extended their activities into the environmental movement. Since these organizations are not recognized by the government, they are financially very weak. Nevertheless, they have dynamically acted and attracted a lot of public attention. The activities of the independent NGOs as a whole may be summarized as follows: public education about environmental problems, investigation of pollution damages, supporting the damaged residents, protest against the construction of nuclear power plants and golf courses, monitoring environmental qualities in polluted areas, launching campaigns for environmental protection, and pressing the government and industries for better environmental policies, etc.



## 2. Population Redistribution Policies of the Government

As mentioned earlier, Seoul as a capital has dominated the urbanization scene in Korea. The concentration of population in the Capital/city has brought about a lot of problems - housing shortage, congestion, pollution, classroom shortage, strains on public services, and the like. It has also created a seriously imbalanced development between Seoul and other regions. Thus, population redistribution policies were urgently needed. The rationale of population redistribution were to control population concentration in Seoul and to seek balanced developments in Seoul and other regions.

Around the year 1970, various plans to limit population concentration in Seoul and to disperse the Capital's population to other areas were initiated by Korean government (Ban, 1977; Luther, 1979; Kim et al, 1979; Hasan et al, 1979; ESCAP, 1980). Despite the various efforts of the government, the population of Seoul has continued to grow. The population of Seoul increased from 5.5 million to 8.4 million between 1970 and 1980. As of 1990 Seoul's population was over 10 million. Then, what kinds of measures were implemented to control population concentration in Seoul?

The major policies during the early 1970s were the establishment of new industrial complexes, tax incentives for prospective firms in the new industrial complexes and local towns as well as regulations restricting the building of new factories in Seoul (Kim and Donaldson, 1979). In addition, the government established a greenbelt encompassing the city of Seoul to control disorderly urban sprawl. In order to prevent student migration, the government restricted student transfers into Seoul and restricted the establishment and expansion of college departments in Seoul. To reduce quality difference between universities in Seoul and in other regions, programs of faculty exchange between universities in Seoul and other regions were employed. Central government agencies were dispersed to cities in other localities. Finally, a higher residence tax was imposed upon the residents of Seoul.

For the development of rural areas the new Village Movement (Saemaul Undong) was launched in early 1971. The Saemaul Undong policy had many ambitious goals

enlarged by various campaigns for the speedy introduction of rural innovations, containment of rural-urban migration, bridging the gap between rural and urban incomes and for the improvement of rural environment in general. The Saemaul-undong actually stressed the building of comfortable, convenient and progressive villages by the villagers themselves. It attempted to improve the village environment and to increase family income by inculcating a spirit of industrious, cooperative self-improvement.

Despite the various population policies of the government during the early 1970s and nationwide Saemaul-Undong since 1971, the unequal development between urban areas and rural areas continued and thus a massive influx of rural migrants to cities, especially to Seoul did not stop. Taking into account the serious consequences of the relentlessly growing population in the capital, Korean government has begun to organize a strong task for a comprehensive redistribution programs. Since 1976, the importance of controlling Seoul's population has been especially emphasized by the President. Since then, the issue of Seoul's population growth has been treated as an integral component of Korea's national security policy and as a consequence given higher priority than ever before (Kim *et al.*, 1979). Over the next year, the government agencies reviewed existing policy measures, devised new measures, and developed an integrated and comprehensive plan for population redistribution.

The 1977 plan was composed of a number of short-term measures designed to reduce Seoul's population and the essential long-term relocation programs in conjunction with Korea's 15 year (1977-1991) economic and land development plan. First, the plan was to strengthen the existing policy measures restricting in-migration to Seoul through the regulation of public buildings, land utilization, education expansion, and the like. Second, it was to encourage gradual removal of the existing industrial installations and their employees from the boundary of Seoul and its vicinity, that is, a 40 kilometer commuting zone. Third, the plan was designed to develop five growth poles (Daejun, Daegu, Gwangju, Jeonju, and Masan cities) in order to absorb the prospective in-migrants to Seoul. In time with the development of growth poles the plan further suggests the development of small cities surrounding each pole, each forming an integrated urban sphere.

Finally, the most important component of the new plan was the construction of a new capital which would ultimately receive major administrative functions.

However, even with the most ambitious policies yet prepared, population concentration in Seoul has not abated. There were several reasons that those policies could not be successful. First of all, the proposal for the construction of a new capital has not been implemented because it was not thoughtfully planned with respect to cost and effectiveness in achieving various goals. Secondly, growth pole schemes were not realistic because they were confronted with such problems as follows: the high costs of direct outlays and subsidies for growth pole ventures would significantly affect the government economy; the targeted local cities are too limited in social and economic life to attract the migrants (Kim and Donaldson, 1979). Finally, the new plan did not deal with rural development which might be more important than population redistribution.

## VI. Conclusion

The rapid process of industrialization in conjunction with the rapid urbanization has contributed to the deterioration of the environment in Korea to a great extent. Some measures indicate that both air and water pollution have reached beyond the tolerance limits. Considering that the tolerance limits of the chemical materials in Korea are much higher than those in other industrialized countries, we can imagine that Koreans have been suffering from serious environmental problems. Owing to the deteriorated environment, many people have complained about their health problems. In some industrial complex areas, residents have had to move to other residential areas in order to be free from environmental problems.

The "Anti-pollution Act" and "Environment protection Act" were established in 1963 and 1977, respectively. But the former law has not been enforced for a long period of time and the latter law has not been strictly enforced. Besides, the general public were not allowed to participate in the environment-related decision making. Nor were they allowed to protest against the environmental policies of the

government. The reason is that the main concern of the government has been less on environment than on economic growth itself. The extremely low budget for environment (0.24% of the national budget as of 1993) is a sign of the meager efforts of the government for protecting the environment.

Under these circumstances, the roles of the non-government organizations have been very important. The roles of the NGOs have been highly evaluated, especially in urging the government to be more seriously concerned about the environment and thus to more strictly regulate environment-related crimes. Alleviation of environmental deterioration requires fundamental changes in basic value orientations and major social institutions that are taken for granted for so long. The efforts toward environmentally sustainable society would include acceptance of the limits to growth and of distributional justice, replacement of hard technology with soft one, and shift of basic values from those viewing the natural environment as an object of exploitation to those emphasizing a harmonious relationship between nature and man (Yang *et al.*, 1995).

Sustainable development would also be possible through controlling the urban congestion. The problem of urban congestion due to rural-to-urban migration may be eased by improving conditions in rural areas and by expanding rural employment. It is thus necessary to invest more money in rural areas. Finally, the system of local autonomy should be successfully implemented. Korea initiated the system of local autonomy in 1995. There was a national election for voting the heads of local governments in May of 1995. Successful implementation of the system would result in the efficient use of national resources and thus create balanced regional development in both cities and rural areas.

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