

Chapter 5

Environmental Policies in Korea and the Up-coming South-North Regional Cooperation

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1. Introduction

Since the epoch-making summit meeting of two Korean leaders in June, many discussion events on developing the efficient practical cooperation with North in various areas have been taking places here in the South. Environmental field is not an exception.

It is an irony of history, perhaps a pleasant one, that once environmental advocates, some of whom were actually imprisoned, were accused of threatening national security by spreading 'communist' ideology under the authoritarian growth-oriented regime in the early development era in the South and now environmental cooperation with 'communist' North is regarded not only essential to preserve Korean peninsula 'clean' but even as an effective vehicles as well, for its lesser political nature, to smoothen the talks for the cooperation as a whole.

However, concerns over environmental problems in the North are not of immediate priority in the environmental policy spectrum of Korea. Korea has its own problems to be solved. Water quality of major rivers supplying drinking water for domestic use did not improve up to the acceptable level at all for many years. In some parts of the country, people are not still provided with proper sewage treatment.

Conflicts among neighboring local governments concerning various environmental issues have been ever rising. Almost all the localities are engaged in disorderly land development projects simply because they want to boost the economy. Pollutants from industrial sources did not decline. Air quality in the metropolitan areas and even medium-sized cities doesn't show the sign of improvement as number of vehicles is rapidly increasing without implementation of proper pollution prevention measures. And yet there are other kinds of tasks ahead, including an adjustment need

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in energy consumption-supply structure to slow down 'green house gas' emissions to meet the global standards.

It appears that, after 30 years of compressed economic growth, Korea still has difficulties in minimizing 'environmental problems from industrialization' and some part of the society suffer even today from 'pollution of poverty' type pollution. At the same time we need to take necessary actions for 'global environmental preservation.' Thus, Korea faces environmental problems of at least three different levels at the same time, while global environmental issues are main concern in the developed world.

This is not to assert that environmental deterioration in the North is not of our concern. What we have to do first is to sort out the issues and problems in the South by characteristic and level. And then proper strategies can be designed and employed accordingly. At the same time, we need to build up a policy matrix where all the strategies are assembled and well fit in. In the long run, we need to introduce a grand environmental policy framework incorporating all the environmental issues/tasks in Korean peninsula. It would be more desirable that the long-term scheme is expanded and carefully examined in the context of 'sustainable development' of Northeast Asia.

Without such gradual approach, if we take environmental issues of the North and mix together with the problems of South, treating those as the matter of 'one country', the situation would be complicated and more difficult to be tackled. We should bear in our mind that DPRK is 'de facto' independent nation after all and will be so until the reunification is achieved which we don't exactly know when.

The North has its own needs and priorities where environmental restoration might not be of the most urgent need.

However, it is absolutely necessary to continue or/and even further advance pre-engaged cooperation projects, and to develop new cooperation schemes at individual project base which are acceptable/feasible to both sides.

2. Review of Korean Environmental Policies

2.1 Economic Development

The first stage of Korea's economic growth can be characterized as a period in which the momentum for growth was established and the base for industrialization created. This covers the period of post Korean War before the first 5-year economic development plan was launched in 1962. Korea, then, remained largely a traditional, closed agrarian

economy with approximately two-third of the working population in agricultural sectors.

The second phase is that of outward-looking strategy from 1962 to 1971. The development period can be considered as the most important stage in Korea's modern economic development, due to the significant progress in the development of Korea's industrial base, and fundamental changes, in the nation's development strategies. This involved both policy reforms and institutional changes. The essence of the strategy in the 1960, was to promote labor-intensive manufacturing exports in which Korea at that time had a comparative advantage.

The third phase is characterized as having the strategy of extensive government intervention and the promotion of import substitution in 1972 to 1978. The government accelerated the intervention during that period, and made a shift in policy focus toward import substitution, particularly in the heavy and chemical industries. The growing heavy and chemical industrial sectors required large quantities of external energy, thereby placing severe strains on the nations developing infrastructure.

The structural adjustment with stability and liberalization in 1979-1985 is the fourth phase in Korean economic development. The economy began to show significant sign of strain in the late 1970s, as commodity exports declined for the first time since 1962 and the GNP growth showed the lowest rate since 1972. The government, however, employed a comprehensive stabilization program based on conservative fiscal and monetary policies. The economy slowly recovered from the set-back in mid-1980s. The environment development strategy in 1980s can be characterized as pursuing three goals: price stability, market liberalization, and balanced growth.

The fifth phase of the economic development covering 1987-1992 period was accompanied by drastic change in socio-political environment. The first part of the phase is the most distinctive period in Korea's recent economic development history. The export-led growth of the economy was more vigorous than ever, thanks to favorable conditions in the international scene since 1985. Especially between 1986-1988, the Korean economy experienced unprecedented prosperity, and saw itself as a leading middle-income industrial country.

As the 1980s come to their end, however, Korea has begun to have a rather difficult challenges such as persistent trade friction with major industrialized nations and substantial improvement of comparative advantages of other newly industrializing economies in many areas.

The economy has begun to grow moderately since 1989, registering high trade deficits. Domestically, the Korea labor force became voiceful in demanding its share of the fruits of economic growth, especially after the political 'liberalization' in 1989. The demand of the people in various sectors has been growing so rapidly that the economy was barely able to meet those in early 1990s. In recent years since the civilian government launched in 1993 after 30years of military rule, Korean economy underwent various reforms in major sectors. Among the reforms under Kim Young Sam's government, employment of real-name financial transaction system, elimination of private sects in the military and adoption of local autonomy in all levels of localities were the major ones.

Economic performance was modest until the financial crisis hit the Korean economy and pulls it down. The hardship by the crisis was doubled with careless expansion of the secondary and tertiary financial institutes and the incompetent credit market.

The most urgent task of Kim Dae Joong's government who assumed the power in 1998 is to take immediate actions to prevent the further disruption of the financial system of the economy by securing foreign exchanges. Then, the government has been actively pursuing such policies as opening the financial market and re-structuring in major areas including public sector, financial institutions and the 'ChaeBol' structure in order not only to put the economy back to the ordinary track but even more to meet to the global standards and eventually to fulfill the goal of attaining knowledge-based economy. Some of them, more or less are, successfully done while most of them are still under on-going stage. It is too early to give a general evaluation now

2.2 Environmental Policies

Environmental problems of a country are closely linked to its pattern of economic growth. Although a decline of environmental quality in Korea was observed in the 1960s, environmental deterioration did not receive sufficient attention (see <Table-1>, <Table-2>). Most academics and planning officials were preoccupied with growth and industrialization.

During the 1970s, some people began to express concerns about environmental degradation. Those concerns were, however, ignored by the government, since the authoritarian senior decision makers insisted that environmental pollution abatement should in no way hamper industrial growth. The general public was not fully conscious of environmental standards at that time. In this period pollution from domestic sources

as well as industrial sources was particularly widespread in the major rivers, and throughout the rapidly growing urban centers (see <Table-3>, <Table-4>).

Even if planning authorities had intended to pursue a clean environmental policy, the economy would not have produced sufficient surplus resources to permit it.

The tough position for the government in favoring only industrialization relaxed somewhat in the late 1970s. Commencing with adoption of pollution control as a major new development objective in the 4th plan (1977-1981), the government gradually took some first steps towards managing the new severe pollution problems.

In the 5th plan (1982-1986) a new explicit environmental conservation 'goal' was included as an official 'goal' of national economic development. To implement the first steps toward realizing this goal, the government took a series of actions including the revision and reactivation of the 'old and almost dead' Environmental Protection Law, the creation of an operating agency and related research institutes. This historic turn-about, a government-led effort to massively upgrade the priority given to environmental protection, was regarded as highly praiseworthy, considering it was accomplished in a relatively short period of time. In the document in the 6th plan (1987-1991), the environmental conservation plan has been given its own chapter.

Legislation and the plans were, however, not realistic enough to make policies effective.

In 1990, the Environmental Conservation Act was revised and divided into several specific acts. An ambitious environmental policy was launched, including the setting up a comprehensive environmental plan. The long-term environmental policy seemed to focus on four aspects: strengthening standards, preventive approach, polluter-pays-principles, and widening time horizon.

In the ambitious First Year Plan for the New Economy of 1993-1997, improvement of the environment did not seem to gain enough attention. The word 'environment' did not appear in any objectives among many under the three basic goals to achieve. Nevertheless, the Environmental Sector Plan of the New Economy Plan includes some policy objectives consistent with conceptual framework of 'sustainable development'.

The government, in this period had an intention to improve the environmental quality. The government provides Green Vision 21 in 1996 and Comprehensive Plan for Environmental Improvement following year. But, such effort did not come up with satisfactory outcome.

The situation even got worse in a certain area such as land use. Virtually, after the local autonomy was adopted nation-wide, all localities are municipalities were

actually engaged in various development projects accompanying reckless exploitation of the land.

During and after the economic crisis in the end of 1990s, all the efforts and resources were put in restructuring the systems, lessening the unemployment and revitalizing the economic growth. People seemed to implicitly accept that environmental problem was less urgent matter. Any significant policy effort or any sign of improvement of the environmental quality was not observed in that period, although the revised Comprehensive Plan for Environmental Improvement, covering the long periods, was announced in 1999 when the economy somewhat recovered from its worst point of the downturn (see <Table-5> for details).

2.3 Institutional Arrangements

Environment Administration was established by expanding and reorganizing Environmental Affair Bureau in Ministry of Health and Social Affair in 1980, in the same year the Constitution of Korea included environmental rights as basic human right.

In 1986, Regional Offices of Environment were established, having one office in each province, to meet regions' specific needs and to ensure more effective environment management at regional level.

Environment Administration was upgraded to the ministerial level, Ministry of Environment (MOE), thereby strengthening the coordination function of environmental affairs among concerned agencies in 1990.

All the water management-related matters, such as water supply and sewage system, and portable water management were taken from other ministries and integrated under the control of Ministry of Environment in 1994. The reform of governmental organization in 1998-1999 allowed MOE more authority of administrating the national parks. Thus, MOE's executive function was broadly reinforced. But it might mitigate the role of coordination among the agencies and setting up comprehensive plans. Besides bureaus and offices in the main structure, MOE has control either direct or indirect over a number of environment-related organizations.

Given that environmental relating administration covers a wide range of activities, environmental administration of the central government is delegated to a number of ministries including Ministry of Science & Technology, Ministry of Agriculture & Forestry, the Ministry of Construction and Transportation, the Forestry

Administration, Ministry of Labor, Ministry of Commerce, Industry and Energy, Ministry of Culture & Tourism, Ministry of Maritime Affairs and Fisheries, Rural Development Administration (see <Table-6>).

The highest ranked local authorities such as special city, large city and provincial authority operate regional institutes for environmental research and monitoring the pollution level. Major role of local authorities (at all level) are to conduct various regional environmental protection activities within their capacity. In addition to their own works, local governments carry out missions delegated from MOE.

To conclude, in spite of the strong political will frequently observed since early 1980's and some signs of improvement of environmental quality, there still exists a one-sided approach of identifying problems and seeking the solutions in environmental sector only. It is necessary to change this approach and to also make a great effort to ease administrative, institutional, and financial constraints and limitations.

It is well known that Korea's environmental problems have been closely related to the patterns of economic development for the past 40 years and interlinked with various sectors which require a multi-sectoral and comprehensive approach for solutions. Not only coordination between ministries of the government is important, but cooperation among sectors in the economy and proper sharing of responsibilities among constituents is also needed.

What Korea needs now is to conceive a framework, which incorporates all the environmentally related factors and elements. The concept of 'Sustainable Development' provides a useful tool for that purpose. Once this is provided, the next task is to apply the framework to the environmental planning and to formulate development strategies.

3. Environmental Cooperation in Northeast Asia

Northeast Asian region faces a wide range of environmental threats. As environmental deterioration in the Northeast Asian region worsens and economic inter-relations among the countries deepen, regional environmental cooperation seems necessary and important. Unlike political/economic cooperation, the environmental cooperation entails fewer constraints. In fact, it looks that this region has a number of formal cooperation frames. But the region doesn't seem provided with an adequate set of working/management mechanism to properly address the problems.

Let's take a closer look at what have been discussed regarding environmental cooperation in Northeast Asia.

Nature of regional environmental problems in Northeast Asian is not much different from any other region. Those are basically trans-boundary air pollution and marine pollution (both from land-based sources and from vessel-sources including ocean dumping).

A specific feature of the trans-boundary air pollution in this region, besides acid rain, is 'sandy dust' phenomena. The phenomenon is often suspected as bringing TSP and other air pollutants into receiving countries. Pollution from land-based sources are the main contributor to degradation of the marine environment. But, in this region, problem of ocean dumping may be more serious as the dumping objects are radioactive wastes (even high level). We are not sure whether it has been terminated or not. In any case, the impact by the dumping on concerning areas should to carefully examined and we should somehow come up with suitable solution for the negative effects.

There are four good reasons for Northeast Asian countries to pay full cooperative efforts in order to preserve the environmental quality in the region.

First, the countries in the region are geographically close, bordering each other. Oceans in the area are accessible to at least four nations.

Second, cooperative atmosphere in the region is now prevailing more than ever, since the end of cold era. People in the region recognize the importance of precautionary approach to prevent further deterioration of regional environment.

Third, international guidelines and action plans such or Agenda21 strongly encourage the regional cooperation to tackle environmental problems.

Fourth, environmental cooperation in this region can be more comprehensive, including energy-related issues such as developing alternative sources and energy demand management. This is very important in this region as the drastic increase of energy consumption is very likely, which might cause environmental and economic instability in the region.

Benefits are generated by a successful cooperation. It is effective for the region as a whole to minimize the negative impacts of trans-boundary air pollution if employing precautionary measures as well as end-of-pipe solutions through regional cooperation mechanism. Cooperation in environmental field is helpful to promote advancement of various cooperation tasks in other sensitive areas, in turn contributing to strengthening the regional stability in general.

From effective regional cooperation for environmental presentation, direct and indirect economic benefits are realized. The 'common property', environmental resources in the Northeast Asia is more efficiently managed in the regional level than at

individual national level. Scale economies are obtained by sharing knowledge, know-how and resource among participating countries.

There are basically three levels of environmental cooperation in Northeast Asian region. Those are bilateral agreement, trilateral cooperation and the multilateral cooperation.

As shown in <table-7>, bilateral agreements among major countries except DPRK for environmental cooperation have been established. Two agreements important to Korea are those with Japan and China. Environmental cooperation between Korea and Japan was a part of Science and Technology Cooperative Agreement. Both sides felt such arrangement was not sufficient enough to deal with the environmental issues of common interest. Korea-Japan Environmental Cooperation Agreement was officially signed in 1993. At the fifth cooperation committee in 1999, both sides to maintain accordance in the talks for regional environmental issues and to enhance the cooperation especially for global environmental preservation efforts agreed it.

Even before the agreement between Korea and China, there had been a number of joint workshops and seminars, and collaborative researches on the environment at non-governmental level. It was 1993 when both countries formally signed the agreement, which put a strong emphasis on the joint efforts. With the agreement, the Environmental Cooperation Committee was formed and its first meeting was held in 1994. In the recent meeting in 1999 (6th meeting), it was agreed to activate the cooperation in environmental industry and to strengthen the role of Cooperative Research Center for Environmental Science.

Another form of the cooperation in Northeast Asia is the trilateral agreement among Korea, Japan and China. Recognized that Korea, Japan and China are core countries in forming cooperative schemes for environmental preservation in Northeast Asia, it was proposed by Korea to establish the Tripartite Environment Ministers Meeting of Korea, Japan and China in 1999. The aim is not only to strengthen the cooperation between three countries but also to serve as a vehicle in promoting efficient multilateral cooperation in the region.

Many of cooperation are proceeded at multilateral level. One is the Northeast Asian Conference on Environmental Cooperation (NEAC). The conference is of ministerial level and has been annually held since the 1st one in 1992. Korea, Japan, China, Mongolia, Russia are currently the member countries. Japan initiated their conference which puts its primary emphasis on exchanging information and sharing experiences, rather than conducting joint projects by setting up a formal cooperation

mechanism. There is a strong possibility that an information exchange network will be set up.

The other one is Northeast Asian Sub-regional Program of Environmental Cooperation (NEAPES). The same five countries of NEAC and DPRK are the members. Since the initial stage, the role of UN Economic and Social Commission for Asia and Pacific (ESCAP), as secretariat, has been crucial. Joint projects, either bilateral or multilateral, are to be conducted in specific fields, giving priority to energy and air pollution, ecosystem management, and capacity building.

Environment Congress for Asia and the Pacific (Eco-Asia) was established under Japanese lead in 1991. Since then the meeting has been held 8 times. It is the meeting of ministerial level, currently informal, but expected to be a formal one, sooner or later. As ten East Asian Countries, including Northeast Asian Countries, are the members, the meeting lacks coherence especially for the environmental cooperation of the Northeast Asian region.

The Northeast Pacific Action Plan (NOWPAP), the UNEP Regional Seas Program, is only one example of marine sector-specific regional cooperation in the Northeast Asian region. Five participating countries adopted NOWPAP in September 1994: Korea, Japan, China, Russia, and DPRK. But, DPRK has not participated any meeting after the first one in 1994. Three goals adopted were: the prevention of further deterioration of the coastal and marine environment; the recovery of the marine environment which has been degraded; and the long-term sustainability of coastal and marine environmental quality.

In the 4th meeting of 1999, it was decided to set up four activity centers in the member countries: Center 1 for marine information and data in China; Center 2 for marine environment monitoring in Russia; Center 3 for marine pollution prevention in Korea; Center 4 for special monitoring and coastal environment evaluation in Japan. Member countries agreed on establishing a permanent secretariat. But details were not provided yet. In order to make NOWPAP a substantial body for regional environmental cooperation, it is necessary to overcome several obstacles such as DPRK's inactive attitude, re-arrangement of secretariat role in consultation with UNEP, and securing the fund.

Along with the intergovernmental and interministerial levels, there are number of joint efforts and cooperation at NGO level (see <Table-7>).

Despite various channels and levels of the cooperation, the efforts did not come up with any definite cooperation regime. The efforts seem to be still at the beginning stage. It is not an easy task as countries in the region differ one another in their growth

stages, their size, their factor endowments, etc. Besides, the countries in this region are not so familiar and experienced with such agreement practices as in western countries. On top of that, when DPRK joins in the 'game', the situation will be a little more complicated, which might requires somewhat different framework for cooperation.

Regardless of whether we utilize the existing frames or set up a new regime, what is important is to have cumulative efforts. Nothing can be achieved by 'once and for all' approach. It should be an outcome of a series of communications and joint projects, the sequence of Canadian/American agreement relating water is very instructive in this regard. The question is then how to combine already-accumulated efforts with new ideas and programs for a better future.

4. The Cooperation of Korea and DPRK

4.1 Experience from Germany

The process of German reunification and the challenges afterward gave useful lessons in many areas to Korea. The field of environment is one of them.

Both Germanys recognized environmental issues, including trans-boundary pollution, were important even in early 1970s. Major water pollutants flow from the upstream, East Germany to the downstream, West German areas. With regard to air pollution, West Germany is a victim again as the wind normally blows from the east to the west.

Although East Germany agreed on polluter-pays-principles, she was not so enthusiastic with an action for cooperation.

In 1973 "Environmental Protection Agreement" was signed by both. It stimulated the negotiation. Afterward, the East discarded the agreement for some reasons and then has not had any interaction until 1980.

The talks for environmental interchange and cooperation started again in early 1980s. The issue of conflict was rather specific focusing on pollution prevention in river Werra. It was resolved by installing pollution abating facilities in upstream area, which is in East Germany, and a part of the cost was borne by the West.

The cooperation in full scale started after, so called, the Basic Agreement for Environmental Protection (Umweltschutzrahmenabkommen) was adopted. The agreement formally signed by both sides when the premier of the East visited West Germany in 1987 provides extensive substances, applicable to both East and West, covering all the environment protection-related fields. It also specified all the details of

cooperation in each fields. In fact, both sides were urged toward cooperation and environmental protection action, by the nuclear accident in Chernobyl in 1986. Process of the environmental interchange has been speeded up since then. By March 1990, East Germany concluded twelve agreements/conventions with either West Germany or West Berlin.

The interchange between two Germanys was quite active at civil society level. The meeting of the Organization for Nature and Environment (Gesellschaft für Natur und Umwelt) in the East and the Federation for Environment and Nature (Bund für Umwelt und Natur) in the West in 1987 was an event of good example. Since then, the societies of both sides have jointly organized environment-prevention gatherings in large scale. Such environmental movement in the East raised the awareness of environmental preservation and the human rights among the people in the East and turned out to be a major contributing factor to the eventual reunification.

One thing we should note is that environmental problems facing two Germanys is not of only German concern but also problems of other European countries in the region. So, it is natural both sides have been participating in a number of international conventions concerning the environmental issues in Europe. That is, the East and the West have already established indirect and somewhat loose channels of communication in environmental field through various multilateral cooperation frames. Communication between the two in the multilateral set-up did not seem to play a deterministic role for the cooperation between the two countries in full scale, but it certainly contributed to some extent.

4.2 Environmental Issues in DPRK

Far different from their assertion/propaganda, serious environmental deterioration has been frequently observed in DPRK. Although related data and statistics are not readily available, it was reported pollution problems are at serious level in some sectors of DPRK.

People in Heungnam are known to suffer from air pollution which were originated from excessive investment in heavy industry in early 1970s.

Discharges from mining area and steel factories pollute major rivers and coastal areas.

The worst part is the forest. The recent shortage of food and daily necessities accompanying the economic difficulties started somewhat earlier caused disorderly lumbering leaving most forests in DPRK devastated. Wild lives have not been well

protected. Especially in recent years, many of the favorite animals, fishes and wild plants were over-caught. It is again due to the economic stagnancy.

What are the main reasons for such deterioration besides the recent economic difficulties. First, without market/price mechanism, it is difficult for socialist system to provide individuals/economic agents effective incentives to get engaged in environmental protection activities. There is not sufficient mechanism for any individual to bear the social cost for pollution.

Second, in a planned economy, all the economic agents must achieve what they are asked. Environmental protection is naturally of lower priority then. Under such planned economic system, adjustment of industrial structure toward environment-friendly one is almost impossible.

Third, DPRK, keeping itself closed from outside world, has not been exposed to technology information, experiences of other countries and related knowledge. A typical example is that power plants and coal chemical industries in DPRK are still using the coal of low calorific value discharging large amount of per unit pollution.

Fourth, the current stagnant economy in DPRK does not generate the surplus resources to invest for environmental protection.

Fifth, it is known the environmental administration reveals the structural inefficiency and rigidity in the management. The operational structure is rather vertically working which does not allow effective horizontal coordination.

Sixth, the authority does not accept the existence NGO activities in real sense. NGOs in DPRK are merely subsidiary organizations to the party. They don't play the function as in the other countries. Consequently, people are rarely exposed to 'environmental awareness' except the government's propaganda.

4.3 Need for Environmental Cooperation

The South-North cooperation for environmental preservation is not "zero-sum" game, but "positive-sum" game, beneficial to both sides. As being non-political, the environmental cooperation even serves as an effective tool to smoothen the talks for general cooperation and to make those move forward.

Environmental problems in DPRK have been worsening mainly due to excessive expansion of heavy and chemical industries in 1970s. Yet, its stagnant economy is not just capable of investment for environmental restoration by itself. That requires the cooperation with the South.

Because of trans-boundary nature of major pollution problems in Northeast Asia such as acid rain, sandy dust phenomenon, land-based marine pollution, etc. Cooperative effort of both Korea is not only of mutual benefits, but also good for the region as a whole.

Since both Korea are inside Korean peninsula surrounded by seas, it is natural to treat biological systems in both sides as one big system. It is, therefore, necessary to maintain the balance of the system for persistent environmental preservation of Korean peninsula. In that regard, the cooperation between the two seems essential.

There have been several attempts for environmental cooperation proposed mostly from the South both at governmental level and by non-governmental channel. In 1992, through South-North Economic Cooperation Committee the proposal was made for exchange of environmental information/knowledge and joint research/survey. But the political situation at that time just did not permit the proposal working. Also in 1992, at UNCED, the prime minister of Korea proposed the joint survey on the nature and eco-system in DMZ. There was not any response from the North.

At the UN assembly meeting in 1997, the president of Korea proposed South-North cooperation for preservation of the eco-system in DMZ again. No response was made by the North.

Many attempts were made also by NGOs and by individuals. Six research proposals on migratory birds, ecological system of Mt. BackDu and eco-system of DMZ was offered at personal level. NGOs and academics in Korea made offers on survey of eco-system, academic interchange and a number of invitation to international environmental seminar was made 10 times or so all together. Invitation was successfully done only once at 'East Asian Scholars Meeting on Environment and Development' in Bangkok, 1995. However, contact of both sides was made four times at the meetings organized by international institutions including such as UNESCO and IUCN in third countries.

Third channel through which both side work for the interchange is international organization. In 1994, UNDP proposed both sides 8 environmental cooperative projects including comparison of environmental regulations and standards of both sides, management of marine and coastal environment and ecological survey in DMZ, which were rejected by the North.

The first successful outcome of environmental interchange between South and North came out in 1995. Both signed the 'Memorandum of Understanding on Environmental Principles' effective for TRADP in the lead of UNDP. Currently, a project for environmental preservation of Tumen River is in its on-going process. This project

aims at the assessment and evaluation of environmental impacts from TRADP, especially for the border areas. The project is financed partly from GEF and a part of the total cost is supported by Korea and China.

5. What can/ should be done

At the beginning stage, the cooperation needs to carry out on-going projects. Then the cooperation can be expanded to other academic projects, joint researches and exchange of scientific information which are not politically sensitive. The cooperation efforts should focus on the needs of North. The cooperative project of specific needs of the North, less environment-related, should be also carried out. It makes the cooperative base sound for the future. It is known DPRK is in severe shortage of energy. This is one area to look into in the environmental cooperation point of view.

Like or not, when the cooperation between two Koreas moves into mature stage, the economic cooperation will be prevailing over cooperation in any other field. Direct investment will drastically increase and many companies of South will locate manufacturing facilities in the North. Tourists from South will soon fill most attractive spots in the North. Definite policies and effective strategies should be devised and implemented to keep all those activities environment-friendly.

The environmental cooperation should be carried out in accordance with the grand cooperation scheme based on the general principles of cooperation. Those need to keep up with the cooperation/interchanges of other sectors. For that we need to employ step-by-step approach, with a systematic working frame, starting from the stage of indirect interchange, moving to the next step of direct coordination, and then carrying out the integrated cooperation scheme finally.

6. Conclusion

Korea still faces environmental problems of 'poverty type' and 'industrialization'. We need to re-address those problems, and devise proper strategies and employ them accordingly. What we have to do is, then, to build up a policy framework incorporating all the issues and strategies.

The environmental cooperation with DPRK should be carried out in conjunction with the grand policy scheme of Korea.

It is beneficial to make a use of German experience. In German case, cooperation has been done at practical level. But formal cooperation agreement was

difficult to be reached for political reasons. Korean and DPRK have not achieved anything both at practical level and at formal level.

There have been relatively active interchanges in many areas between two side even before the formal agreement was signed in German case. People in the East were well informed about the West and rest of the Europe. The environmental cooperation between the two Germanys started through various multinational cooperation agreements in Europe, which were practically operating. This is not the case in Northeast Asia. Then, the cooperation gradually moves to the stage of direct interchange. The policies of the East was reconciled to that of the West finally after the reunification. We have to remember this is not the case in Korea.

As stated earlier, the step-by-step approach, taken by Germanys before its reunification, is also useful for Koreas. In that regard, steady preparation should be made in all sectors, namely legal structure, institutional re-agreement, regulation for the investment in the North, etc.

When the North restores its economic stability and secures the surplus resources, we need to structure a bigger policy frame for environmental preservation of Korean peninsula. And the frame has to be re-addressed in Northeast Asian point of view. For that, there is a need to activate the existing agreements. And, if necessary, we will have to give a serious consideration to establishing a new cooperation regime including DPRK.

<Table -1> Variation of Land Use Structure and its Prospect

Unit : Km²

	1990	2001	Increase/Decrease
Agricultural Land	21,088	19,030	- 2,053
Mountainous Land	64,755	64,036	- 719
Residential Land	1,937	2,334	397
Industrial Land	340	454	114
Public Land	2,165	2,945	780
Wet Land/Others	8,989	11,644	2,655
Whole Land	99,274	100,443	1,169

Source : Ministry of Construction

<Table-2> Selected Environmental Quality Indicators in Korea

Indicator		1982	1997	97/82
Average SO ₂ Conc. in Seoul	ppm	0.057	0.011	0.19
BOD of Han River, Paldang	mg/l	1.0	1.5	1.50
Population Served by Sewage Treatment Facilities,	%	6.0	57	9.50
Municipal Wastes per Capita	kg/day	1.9	1.05	0.52
Production of Pesticides	M/T	17,431	25,300	1.40

Source : Ministry of Environment

<Table-3> BOD of Major Rivers

Unit : mg /l

River	'82	'83	'84	'85	'86	'87	'88	'89	'90	'95	'98
Han, Noryangjin	5.4	6.1	6.7	4.7	3.6	4.3	4.3	3.4	3.4	3.8	3.6
Nak-dong, Mulkeun	3.7	3.1	3.7	3.7	3.6	3.6	3.9	3.6	3.0	5.1	3.0
Keum, Buyoo	2.4	2.3	2.9	2.5	3.0	2.9	2.9	3.5	3.1	4.3	2.4
Young-san, Naju	3.9	5.6	6.5	5.2	5.2	4.2	4.2	7.0	6.7	7.0	5.9

Source : Ministry of Environment

<Table-4> Average SO₂ Level in Major Cities

Unit : ppm

City	'89	'90	'91	'92	'95	'98
Seoul	0.056	0.051	0.043	0.035	0.017	0.008
Pusan	0.047	0.039	0.038	0.033	0.023	0.015
Daegu	0.048	0.041	0.041	0.040	0.031	0.014
Kwangju	0.021	0.017	0.017	0.017	0.010	0.008
Daejeon	0.035	0.029	0.028	0.022	-	-
Incheon	0.065	0.044	0.041	0.036	0.023	0.009
Ulsan	0.029	0.031	0.038	0.031	0.028	0.015

Source : Ministry of Environment

<Table-5> Economic Development Plan and Environmental Considerations

Period	Environmental Consideration in the Plan	Environmental Legislation	Central Env'tal Organization
Before '61	Neglected	* Garbage Disposal Act ('61) * Water Supply and Waterworks Installation Act ('61)	
1 st Plan ('62-'66)	Neglected	* Public Nuisance Prevention Act ('63) * Poisonous & Toxic Substances Act ('63)	
2 nd Plan ('67-'71)	Neglected	* Sewerage Treatment Act ('66) * Act for Wildlife Management and Hunting ('67)	* One section ('67), * One division ('70), in Ministry of Health & Social Affairs (MOHSA)
3 rd Plan ('72-'76)	Neglected		* Small bureau in MOHSA ('75)
4 th Plan ('77-'81)	* Considered as a part of social welfare	* Env't Preservation Act ('77) * Marine Pollution Prevention Act ('77) * Plastics Wastes Treatment Business Act ('79) * Env'tal rights in Constitution, ('80) * Natural Parks Act ('80)	* National Institute of Env'tal Research under MOHSA ('78) * Environment Administration (EA) under MOHSA ('80) * Resource Reutilization Corporation under EA ('80)
5 th Plan ('82-'86)	* Harmony between economic development and environment conservation * Long-term Env't Preservation Plan ('84)	* Nuclear Energy Act ('82) * Env'tal Pollution Control Service Corporation Act, (EPCSCA) ('83) * Wastes Management Act ('86) * Env'tal rights in constitution (87) amended	* Six Regional Offices of EA ('86)
6 th Plan ('87-'91)	* Harmonized development with env't * Mid-term Env't Preservation Plan ('91)	* Env'tal Management Corporation Act ('87) – replaces EPCSCA * Air Quality Conservation Act ('90) * Water Quality Conservation Act ('90) * Noise and Vibration Control Act ('90) * Env'tal Pollution Dispute Settlement Act ('90)* * Toxic Chemicals Control Act ('90) * Natural Env't Conservation Act ('91) * Env'tal Improvement Expenses Liability Act ('91) * Act on a special measures for the Punishment of Env'tal offence ('91) * Act on Treatment of Sewage, Night Soil and Livestock Wastewater ('91)	* Korea Env't Management Corporation under EA ('87) * Env't Preservation Committee, chairman By Prime Minister ('89) * Ministry of Environment (MOE) under prime Minister ('90)

Period	Environmental Consideration in the Plan	Environmental Legislation	Central Env'tal Organization
7 th Plan ('92-'96)	<ul style="list-style-type: none"> * National Declaration for Env't Preservation ('92) * 92-96 Comprehensive Plan for Env'tal Improvement ('92) 	<ul style="list-style-type: none"> * Act on the control of Trans-boundary Movement of Hazardous Wastes and their Disposal ('92) * Act on the promotion of Saving and Recycling of Resources ('92) * Act on Specified Substances concerning Protection of Ozone Layer ('93) * Env'tal Impact Assessment Act ('93) * Korea Resources Recovery and Reutilization Corporation Act ('93) 	<ul style="list-style-type: none"> * Global Env't Issues Committee, chairman By Deputy P.M. ('92) * Environmental officer Training Institute ('92-99) * Korea Environmental Technology Development Institute ('93-97)
New Economy Five Year Plan, '93-'97 ('93)	<ul style="list-style-type: none"> * Green Vision 21 ('96) * 97 : 2001 comprehensive for environmental improvement ('97) 	<ul style="list-style-type: none"> * Special Account for Env'tal Improvement Act ('94) * Development of and Support for Environmental Technology Act ('94) * Soil Environment Preservation Act ('95) * Management of Drinking Water Act ('95) * Promotion of Installation of Waste Disposal Facilities and Assistance etc. to Adjacent Areas Act ('95) * Air Quality Control in Underground Locations Act ('96) * Inland Water Body Water Quality Management Act ('97) * Special Act Relating to the Conservation of the Ecosystems of island Regions such as Tokdo etc. ('97) * Environmental Dispute Adjustment Act ('97) 	<ul style="list-style-type: none"> * Ministry of Environment under President ('94) (Strengthening) * Ministry of Maritime Affairs & Fisheries ('96) * Korea Environmental Institute ('97-) * Water Quality Improvement Planning Board under Prime Minister ('97)
100 National Program for new Governm ent ('98?)	<ul style="list-style-type: none"> * 98-2002 Comprehensive plan for Environ - mental Improvement ('99) 	<ul style="list-style-type: none"> * Wetland Preservation Act. ('99) * Act Relating to Water Resource Water Quality Improvement and Local Resident Support in the Han River Watershed ('99) 	<ul style="list-style-type: none"> * Reform of Central Government Organization ('98-99)

Source : S.W.Han , APEMI, Korea

<Table- 6> Environmental Relating Administration of the Central Government

Min. of Science & Technology	Coordination of nuclear safety control Establishment and implementation of radioactivity preventive measures Regulations on transportation, handling and disposal and treatment of nuclear And radioactive industrial wastes
Min. of Agriculture & Forestry	Measures for agriculture and forestry pollution Planning and technical guidance on the development of agricultural water
Min. of Commerce, Industry & Energy	Import/export of toxic substances and import restriction on industrial wastes Allocation and management of industrial sites R&D on new and alternative energy Safety management of nuclear power generators and disposal and treatment of Nuclear wastes
Min. of Construction & Transportation	Formulation and coordination of a comprehensive plan for national land use Designation of areas subject to the National Land Use and Management Act Designation of areas where development is restricted Establishment and coordination of a comprehensive plan for water resources Development Management of rivers, reclamation and use of rivers and lakes Type approval and performance tests of motor vehicles
Min. of Labor	Countermeasures against occupational diseases and improvement of working Conditions
Min. of Culture and Tourism	Designation, protection and management of national monuments such as rare Plants, animals, etc.
Min. of Maritime Affairs and Fisheries	Protection of marine resources and countermeasures against marine pollution Reclamation and management of public sea waters Countermeasures against pollution of coastal waters Supervision and prevention of marine pollution
Forestry Administration	Formulation of Basic Forestry Plan Protection of forests and supervision of forest destruction activities
Rural Development Administration	Improvement of agricultural land and provision of guidance on soil Improvement

Source : Ministry of Environment

<Table-7> Environmental Cooperation in Northeast Asia

Scope	Level	Descriptions
<ul style="list-style-type: none"> - multilateral - regional - general 	<ul style="list-style-type: none"> - intergovernmental - high/working level 	<ul style="list-style-type: none"> * Northeast Asian Subregional Programme of Environmental Cooperation (NEASPEC) - participating countries : Korea, Japan, China, Mongolia, Russia, DPRK - 1st meeting in Seoul, 1993 : 2nd meeting in Beijing, 1994 : 3rd meeting in Ulan Bator, 1996 : 4th meeting in Moscow 1998
	<ul style="list-style-type: none"> - interministerial - working level 	<ul style="list-style-type: none"> * Northeast Asian Conference on Environmental Cooperation (NEAC) - Participants : Korea, Japan, China, Mongolia, Russia - held annually since 1st meeting in Niigata, 1991 - 9th meeting was held in Ulan Bator, 2000.7.26-28
	<ul style="list-style-type: none"> - interministerial - high/working level 	<ul style="list-style-type: none"> * Environmental Congress for Asia and Pacific (Eco-Asia) - participants : 10 East Asian countries - held 8 times since 1st meeting in 1991
	<ul style="list-style-type: none"> - NGO 	<ul style="list-style-type: none"> *Asia-Pacific NGOs' Conference - participants : East Asian countries and Southwest Asian countries - held bi-annually since 1st meeting in Seoul, 1993 - 5th conference will be held in Agra, 2000.9
<ul style="list-style-type: none"> - trilateral - regional - general 	<ul style="list-style-type: none"> - interministerial - minister level 	<ul style="list-style-type: none"> * Tripartite Environment Ministers Meeting - 1st meeting held in Seoul, 1999 - participants : Korea, Japan, China
<ul style="list-style-type: none"> - multilateral - regional - sectoral 	<ul style="list-style-type: none"> - interministerial - working level 	<ul style="list-style-type: none"> * Northwest Pacific Action Plan (NOWPAP) - Participants : Korea, Japan, China, Russia, DPRK, UNEP - held 4 times since 1st meeting in Seoul, 1994
<ul style="list-style-type: none"> - multilateral - local/sub-regional 	<ul style="list-style-type: none"> - interministerial - working level 	<ul style="list-style-type: none"> * Resource Forestry Environment Group of Tumen River Area Development Programme (TRADP) - Participants : Korea, China, Mongolia, Russia, DPRK, UNDP, UNIDO
<ul style="list-style-type: none"> - bilateral - regional - general 	<ul style="list-style-type: none"> - interministerial - high/working level 	<ul style="list-style-type: none"> - Korea-China Environmental Cooperation Agreement - Korea-Japan Environmental Cooperation Agreement - Korea-Russia Environmental Cooperation Agreement - Japan-Russia Environmental Cooperation Agreement - Japan-China Environmental Cooperation Agreement - China-Mongolia Environmental Cooperation Agreement

