

Social Environmental Education toward Sustainable Development in the East Asian Region*

Jung Wk Kim**

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I. Environmental Issues of the East Asian Region

The East Asia with China and India included is the most populous region in the world and its economy is growing very fast to become the world's greatest economic center in near future. Because of the rapid economic development and the high economic density in this region, environmental stresses have built up very rapidly in recent years. The transboundary air pollution, water shortage, drinking water poisoning, fresh water and marine pollution, deforestation, climatic disasters, and other environmental problems are becoming serious threats to the wellbeing of peoples in this densely populated region. In other word, the East Asia has not been going toward sustainable society. This is well indicated in the ESI(Environmental Sustainability Index) reported by the World Economic Forum in 2005. Most of the East Asian countries ranked the bottom: North Korea ranked 146th among 146 countries evaluated, Taiwan 145th, China 133rd, South Korea 122nd, and India 101st.¹⁾ However, people in this region do not seem to realize the seriousness of the problem and are still obsessed with the growth-oriented economic

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** Professor, Graduate School of Environmental Studies, Seoul National University.

1) Yale Center for Environmental Law and Policy, Yale University and Center for International Earth Science Information Network, Columbia University, 2005 Environmental Sustainability Index, World Economic Forum, 2005.

development. The countries in this region need to cooperate closely to redirect the development paths toward sustainability since most of the problems are inter-related between countries in the region. The citizens' awareness should be built through environmental education since such environmental problems can never be solved without the citizens' participation.

Transboundary Air Pollution

The most noteworthy transboundary air pollution problems observed in this region are the Yellow Dust Storm in the North East Asia and the Indonesian forest fire smoke in the South East Asia.

Yellow Dusts from deserts in China and Mongolia are observed in most of the East Asian countries, but due to westerly wind prevailing in this region, areas in the east of those deserts, Eastern China, South and North Korea and Japan, are most vulnerable. The rapid desertification of Northern China mainly due to overgrazing in recent years is aggravating the problem: the frequency and the intensity are getting worse each year. The PM10 level in South Korea reached 2778 $\mu\text{g}/\text{m}^3$ due to the dust storm in 2002 compared with the standard of 150 $\mu\text{g}/\text{m}^3$. Environmental emergency is declared and schools are closed on those occasions. The storm is a life or death struggle to the people in areas nearby the sources.

As China is becoming the world's manufacturing center, the air pollution in this region is also deteriorating very rapidly. The amount of air pollutants generated in this region is the world's highest. The burning of the low-quality coal which contains a high level of fluorides and heavy metals is the main source of air pollution in China. These coals are widely burned to dry agricultural products which absorb fluorides and other pollutants emitted. A study reported that the IQs of the children in the ages of 8-13 in villages with high occurrence of fluorosis from burning these coals showed about 10 points lower than those in other areas.²⁾ Hankyore, a Korean daily newspaper, also reported that more than 40 million Chinese people suffer from symptoms of fluorosis, making it the most widespread epidemic in China.³⁾ As the air pollution is regionalized, the soils and waters in the whole North East Asian region will be affected.⁴⁾ Japan even claims that more than half of the acid deposits in Japan comes from China.

Since 1977, the Indonesian forest fire smoke has become a regular environmental event in South East Asian countries like Indonesia, Malaysia, Singapore, Brunei and Thailand. This year again Malaysia declared emergency in heavily-affected coastal areas. Public facilities like airports and schools were closed. Formerly, the indigenous farmers who practice the shifting agriculture used to be falsely blamed

2) Li, X.S., J.L. Zhi and R.O. Gao, "Effect of Fluoride Exposure on Intelligence in Children", *Fluoride*, 28(4), 1995, pp. 189-192.

3) <http://www.hani.co.kr/kisa/section-004005000/2005/08/p004005000>

4) T.Y. Kim, A Study on the Effects of Air Pollution in China on the Korean Peninsular, Master Thesis, Graduate School of Environmental Studies, Seoul National University, 1993.

for the fire. They depend on the forest for living themselves so that they wouldn't destroy their source of living. They need only small patch of farms and know exactly when and how to burn for their farming. Now the main cause of the forest fire turned out to be the commercial burning of forest to expand palm oil plantations or plantation forests in Kalimantan and Sumatra.⁵⁾ Burning is the cheapest way to create new farms. Since many of these companies are multinational, it causes strains between Asian neighbors regarding which countries and which companies are responsible for the fires.⁶⁾ The smoke gets worse in dry weather, especially when coupled with the El Nino.

The air pollution in major cities of East Asia ranks among the worst in the world and is claimed to be responsible for the deaths of about 500,000 people each year, according to WHO.⁷⁾

Deforestation

The tropical forest in South East Asia is disappearing rapidly. During the ten-year period from 1990 to 2000, Indonesia's forest decreased by 1.2%(from 118.1 million ha to 105 million ha), Malaysia's by 1.2%(from 21.7 to 19.3 million ha), Myanmar's by 1.5%(from 39.6 to 34.4 million ha), the Philippines' by 1.5%(from 6.7 to 5.8 million ha) and Thailand's by 0.7%(from 15.9 to 14.8 million ha), which are much higher than world average of 0.2% during the same period.⁸⁾ The Philippines and Thailand, once timber exporters, now turned importers. Developments of commercial plantation for oil farms and coffee, forest fires associated with the development, commercial logging, both legal and illegal, and urban developments are the main causes.

Deforestation is going on rapidly in North East Asia also. The deforestation in northern China and Mongolia is mainly due to the overgrazing which is aggravating the Yellow Dust Storm and that in Siberia due to commercial logging.

Destruction of Marine Environment

The Yellow Sea surrounded by China and Korean Peninsular is very vulnerable to pollution. It is shallow, only 44 meters deep, semi-closed, and relatively stagnant, so that the carrying capacity for pollution is very limited. The major pollution sources to the Yellow Sea are Han River carrying wastes from Seoul City, Yellow River and Yangtze River carrying enormous amount of suspended solids and other pollutants, coastal cities like Tianjin, Dalian, and Chengdu, oil spills from oil search operations and

5) Japan Environmental Council, *The State of the Environment in Asia 2005/2006*, Springer-Verlag, 2005, p.3.

6) International Herald Tribune, *Forest Fires Place Strain on Asian Neighborliness*, October 6, 1977.

7) <http://www.enn.com/today.html?id=8579>

8) Japan Environmental Council, op. cit. p. 50.

ship wreck, and others. Both South Korea and China are busy removing tidal flats to develop coastal areas of the Yellow Sea, which provide excellent habitats for marine lives.

Removing the tidal flats also reduces the pollution assimilation capacity of the sea. The tidal flats are known as an excellent waste treatment facility. When the freshwater is discharged to the coastal water, the pollutants readily settle down to the sediments by the mechanism of coagulation. The organic settlements are readily assimilated by tidal organisms. The inorganic and toxic pollutants such as heavy metals settle down as inorganic complexes which are relatively less toxic than in freshwaters and are imbedded under the sediments.

At the moment South Korea is discharging about 450,000 tons of BOD per year through Han River, Keum River, and Youngsan River.⁹⁾ If China's per-capita discharge reaches the level of Korea, the Yellow Sea will be just like sewage. The accumulation of non-degradable pollutants such as heavy metals and toxic organic chemicals will be a serious threat. The Bohai Bay which receives wastes from Beijing, Tianjin, and Dalian already is heavily polluted and the color of it turned black.

The coastal marine environment in the South East Asian region stretching from India to the Philippines is being disturbed for developing fish farms, especially shrimp and eel farms, a large portion of which are built on mangrove forests. Asia produces about 80% of the farmed shrimps and 90% of eels in the world.¹⁰⁾ The coastal wetlands, especially the mangroves, being the spawning and nursery ground for marine organisms, are a very important base for marine ecosystem. The over-supply of nutrients and chemicals such as antibiotics is a threat to the coastal ecosystem. It also makes the coastal areas vulnerable to tsunami as evidenced by the tsunami disaster in the South Asia in 2004. All the heavily developed areas such as beach resorts and fish farms were hard hit by the tsunami, while the well preserved areas such as the Maldives, only 60cm above the sea level, were hardly affected.

Destruction of coastal wetland throughout the East Asia is also jeopardizing the migratory shorebirds. Their flyways stretch from Australia to Siberia.¹¹⁾ The inter-tidal organisms in the tidal flats are their main food source during migration. During their migration in springs and falls, the birds stop at these wetlands and supply energy for further migration. The removal of tidal wetlands is a serious threat to the birds.

Water shortage and drinking water poisoning

Recent studies show that more than 100 million people in Bangladesh, West Bengal(India), Vietnam,

9) Ministry of Environment, The Environmental Whitebook, 2003.

10) Japan Environmental Council, op. cit. p. 78.

11) University of East Anglica and Kyunghee University, A Survey of Coastal Wetlands and Shorebirds in South Korea, Spring 1988, Asian Wetland Bureau, Kuala Lumpur, October 1988.

China and other South Asia countries drink and cook with arsenic-contaminated water, which can cause skin lesions, internal cancers, respiratory illnesses, cardiovascular diseases, neurological problems and others.¹²⁾ Especially in Bangladesh, about one third of the wells among nearly five millions tested are considered unsafe.¹³⁾ This comes from excessive use of tube wells as the safe surface waters get scarce. When the tube wells pump ground water through the geological layers rich with arsenic, the arsenic is leached and accumulated in the well especially when the infiltrated waters get alkaline and low in oxygen. Those contaminated wells should be shut down immediately and safer wells should be provided. It is known that the quality of well water differs depending on the site within a village so that relatively safer wells can be found.¹⁴⁾ And technologies should be provided to the villagers to filter out the pollutants.

With the rapid economic development, the water use increases rapidly and many countries are facing water shortage. For example, the water demand in Northern China is outpacing the supply very rapidly.¹⁵⁾ The ground water table in Beijing is sinking at an alarming rate of 1 meter each year. More than 50% of the river waters in Northern China including the Yellow River are exploited already that it is almost impossible to draw more waters from them. So the China government has a very ambitious plan to divert the water from the south to the north, which will cause a tremendous environmental impact on the sea as well as on the terrestrial ecosystems in the whole China.¹⁶⁾

Accumulating Pollutive Industries

During the process of industrialization, the import of technologies and capitals from industrialized countries is inevitable. The newly developing countries are apt to collect more pollutive industries because of loose environmental standards. In this respect many countries in the East Asian region are very likely to accumulate pollutive industries. Rich countries filter out pollutive industries and transfer them to newly developing countries.¹⁷⁾ Therefore without strict environmental control, it will be very

12) Z. Cheng, et al., "Limited Temporal Variability of Arsenic Concentrations in 20 Wells Monitored for 3 Years in Araihasar, Bangladesh," *Environ. Sci. Technol.*, 39(13), 4759-4766(2005).

13) A. van Geen, et al., "Reliability of a Commercial Kit to Test Groundwater for Arsenic in Bangladesh," *Environ. Sci. Technol.* 39(1), 299-303(2004).

14) Z. Cheng, et al., *op. cit.*

15) The World Resources Institute, *World Resources 1992-93*, Oxford University Press, 1992, pp. 159-174.

16) X. Yu, Water Resource and Water Environment Management in China, paper presented at Environmental Management Seminar, Graduate School of Environmental Studies, Seoul National University, April, 2005.

17) J.W. Kim, "Environmental Aspects of Transnational Corporation Activities in Pollution-Intensive Industries in the Republic of Korea: A Case Study of the Ulsan/Onsan Industrial Complexes" *Environmental Aspects of Transnational Corporation Activities in Selected Asian and Pacific Developing Countries*, ESCAP/UNCTC Publication Series B, No. 15, United Nations, N.Y. 276 - 319 (1990).

likely that the East Asia accumulate the worst pollution in the world.

II. International Environmental Cooperation

The Rio Declaration and Agenda 21 adopted at the UNCED and many other international treaties such as Climate Change Treaty and Biodiversity Treaty stress the importance of international cooperation on the environment. Principle 2 of the Rio Declaration says that states have the responsibility to ensure that activities within their jurisdiction do not cause damage to the environment of other states. Principle 9 of the declaration says that states should cooperate to strengthen endogenous-capacity building for sustainable development by improving scientific understanding through exchange of scientific knowledge and transfer of technologies. It is stated in principle 18 that states shall immediately notify other states of any disaster or emergencies that are likely to produce harmful effects on the environment of those states, and that every effort shall be made by the international community to help states so afflicted.

Since all the environmental problems in East Asia are closely related between countries, the regional cooperation such as in building the people's awareness, exchange of information, environmental monitoring, transfer of environmental technology, joint efforts to restore the damaged environment, and others are compulsory. The cooperation between governments is the most powerful tool to solve for the regional environmental problems. In other regions of the world, there have existed various regional treaties or organizations to solve for the regional environmental problems, such as transboundary air pollution, transboundary river basin management, and marine pollution. In East Asia, such issues are discussed only in recent years. Governments easily agree to the necessity of the regional cooperation. But when it comes to budget and specific agenda for action, they hardly can reach to any agreement.

The cooperation between NGOs are very important because NGOs can effectively initiate grass root movements and monitor if government's environmental policies go wrong. The international NGO networks are becoming effective pressure groups for governments to enact sustainable development policies. There are many environmental issues which need regional cooperation in East Asia as listed above. The civil societies in East Asia need to be strengthened so as to effectively influence the governmental policies. Networking within the region can be an effective means for reinforcing the civil societies.

III. Social Environmental Education

Governments, corporates and citizens have different views on the environment. Governments regard the environmental problems as resulting from the lack of consciousness among citizens, while citizens see them as resulting from the lack of policies in the government. On the other hand corporates do not see the environmental problems at all. In order to have balanced environmental policies, the power between the three should be balanced. However, in most countries in East Asia, the governments have strong power and well-established organizations and the corporates have financial resources and manpower to influence the governmental policies, but the citizens have none.

The citizens in East Asia have not been well trained to voice their opinions to the government and the industrial sector through organized force. Since the world summit conference in Rio in 1992, the importance of the role of civil NGOs is emphasized and it has been encouraged to provide formal channels to reflect the public opinions to the government and industrial sector through NGOs. In a country like Denmark, the government's environmental policies well reflect the public opinion, the number of members being the twice the total population. But in East Asia, the rate is very low. This may be an important reason for the gap between the government's environmental policies and the people's environmental awareness. In order to upgrade the government's policies, it is very essential to mobilize the citizens through social environmental education so that they can voice their opinions toward policies.

In order to transform the East Asian society into a sustainable one, the civil society should realize the importance of sustainability and make efforts toward it. Educating the civil society could change not only the civil society itself but also the government's policies and industrial activities. The formal education in schools can take the role of educating the young generations to orient their environmental value, but the social education can play a more important role by materializing their value in their real daily life and society. A questionnaire survey for middle school students in South Korea showed that about 80% of the students became aware of the importance of saving the environment through mass media, only 11% through formal education and 9% through others.¹⁸⁾ This clearly shows the importance of social environmental education.

There have been serious environmental episodes in East Asia, but the environmental awareness could not creep into the public because the public was not aware of the problems. Mass media plays an

18) S.H. Kim, "A Case Study on the Environmental Education of Secondary School in Korea," Proc. Seminar on Environmental Education and Teachers Training in Korea and UK, Seminar Sponsored by Korea Education Development Institute and British Council, July 1991, p.141.

important role in awakening public awareness. Among mass media, TV turned out to be the most powerful: 75.4% of the surveyees in South Korea answered they realized the importance of the environment through TVs, 18.4% through newspapers and 3.1% through magazines.¹⁹⁾ The TVs in South Korea run several regular environmental programs, some of which are quite elaborate and educative. They are quite successful winning awards for their contribution to build the environmental awareness and excellencies of the programs. But they need more support and investment in order to make the programs more appealing to the public. It will be very effective to educate the public if TVs can attract more viewers to the environmental programs. It will help also if TVs can air short environmental campaign programs or environmental news.

The communities which experienced local environmental movements such as forming community organizations to claim for the damages from industrial pollutions and to oppose the construction of landfills or incinerators show higher environmental awareness and knowledge. They begin to pay attention to their immediate environmental problems affecting their welfare but later they usually open community environmental schools and launch environmental campaigns to reduce domestic wastes, recycle wastes, save energy, monitor community environment and so forth. Very often the citizens' environmental awareness goes far ahead of the government and they lead the policy. For example, composting food wastes, connecting urban communities to rural villages to supply the composts or animal feeds, collecting recyclable wastes, monitoring environmental facilities and others were very often initiated by the community people rather than by the government. It is said that the government's policies for solid waste management in South Korea have been advanced by more than ten years because of those local people's strenuous activities. A certain village along a tributary of Nakdong River is very famous for cleaning up the heavily polluted stream in the village to the first grade water through their own campaign without help from outside. The Korean government has never succeeded in achieving such a performance. The environmental movements used to be regarded as troublesome and nuisance by the government for long. But now they are regarded as very helpful to improve the environment by many. Supporting local communities in their environmental movements is a very effective way to educate the local people and clean up the environment.

Most of the environmental organizations are engaging in the social environmental education. But their main difficulties are shortage of budget and classroom facilities because of lack of funds. Religious groups can organize environmental education as a part of their mission also. Encouraging and supporting churches and temples to the environmental campaigns will be very helpful considering the size of the

19) J.W. Kim, E.C. Jeon, and S.O. Chung, "Promoting Public Participation and Environmental Education in the Republic of Korea", *Environmental Journal*, 29, 1991, pp. 82-97.

religious population in East Asia, so that those places can be utilized as community center for environmental education, recycling, environmental shops and other activities as such.

Environmental lectures can be inserted into the on-job training programs for company employees, re-education programs for the reserve army forces and other social education programs. This can educate more people than any other social education methods. Companies used to avoid environmental issues for long, but now the environmental management is essential to survive in the market under the WTO system.

The social justice system is very important for the environmental education. Due rewards should be paid to the one who observe the environmental laws and proper penalties should follow the environmental crimes. Heavy penalties teach people very effectively.

IV. Conclusions

In order to achieve a sustainable society, the public should be able to influence the government's policies toward the sustainability, monitor companies to produce in environmentally-friendly ways and keep the communal environment clean. The social environmental education is important in that it can build the public awareness and mobilize the citizens toward the goal. The effect of the social environmental education can be very high, but it is not being done so well due to the lack of financial resources and the government's support. The social environmental education can be fortified by aiding environmental NGOs, encouraging religious groups to environmental campaigns, utilizing mass media for educating the public and others. Fortifying the social justice system is very important also so that due rewards go to the benefactors to the environment and proper penalties to the environmental criminals. And it should be emphasized that the cooperation between the countries in the East Asian region is very important to solve the serious transboundary environmental threats in the region.

The East Asia urgently needs international cooperation to conserve its endangered environment. But the environmental cooperation among governments in this region has been insignificant. Even the environmental informations of some countries are hardly known to international community. In order to solve the East Asian environmental problems, the exchange of environmental information should come first. Afterwards the international cooperation will come by step by step. The environmental cooperation does not just mean cooperation between governments but also mean between NGOs. The present way of economic development in this region may result in environmental disaster. For the wellbeing of the people in this region, countries need to establish institutional arrangements to cooperate to conserve the common environment.