

# **Gazing into the Crystal Ball: Environmental Crises as a Formative Factor for the Korea of 2032**

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What will be the formative factors for the situation on the Korean peninsula in 2032? This article presents a conjecture against the theoretical backdrop that local social-political processes are conditioned by major changes in the power structure of international relations. It envisages environmental crises, both global and regional, as one of the most decisive elements that will shape Korea leading up to 2032. In particular the course of events will be largely influenced by developments in international climate control regimes, the responses of China and North Korea to local and global environmental threats, and possible natural and human-caused disasters. Environmental problems have tended to bring civil society sectors together as they also helped to proliferate organisations and consultative bodies wherein the governments and NGOs of East Asia have sought a common solution. The tendency of domestic and regional convergence will continue to grow for the next two decades.

**Key words:** Environmental Crisis, Religious Harmony, Korean Environmental Movements, Regionalism, East Asia.

## **Gazing into the Crystal Ball: Environmental Crises as a Formative Factor for the Korea of 2032**

### **Introduction**

What will be the formative factors for the Korean peninsula in 2032? In envisaging the decisive factors, one useful exercise is to ask how far South Korea has changed from 20 years ago. Unquestionably there has been a sea change. One could again ask what factors have brought about such a change. A pattern emerges from the way that South Korea has been changing over the last twenty years. It has been predominantly shaped by external events rather than by internal ones. In other words the changes in South Korea were brought about more as a reaction to the impact and stimulus coming from outside than as a result of any internal dynamism.

We see the most significant change of that kind in South Korea's *détente* with its former enemies, Russia and China, which culminated in the establishment of formal diplomatic relationships in 1991 and 1992 respectively. A series of partial thawings in the relationship with North Korea soon followed. Such changes would not have been possible if the Berlin Wall had not collapsed in the first place. Other important events include the financial crunches of 1997 and 2008. The long-term consequences of the Asian and global financial failures on the South Korean economy and society are still subject to debate.<sup>1</sup> Yet, however the long-term consequences might turn out, the financial crises triggered off various restructuring programmes that led to economic and social unrest during the last decade. These events, which originated from outside of Korea's border, forced its economy, trade relations, and domestic socio-demographic distributions to be drastically restructured in a way that still has a huge impact, whether positive or negative, on the daily life of ordinary citizens.

To know exactly what the Korean peninsula of 2032 will look like is beyond human ability. Yet, it is not difficult to envisage the pattern in which the forces that could shape the future will interplay. Most possibly we will see the same pattern working here: that is, events occurring at the international level will create and limit choices available to South Korea. Kenneth Waltz has made essentially the same argument. Extensive studies of major changes in international relations and their relations to the domestic politics of individual countries has led him to conclude that the global structure of power both balances conditions and shapes processes wherein certain actors emerge or become defunct.<sup>2</sup>

There is a good reason why Waltz's analytical framework will apply to South Korea's case as well. South Korea now has exhausted much of the inner dynamism that can trigger off large-scale social change. The last instance of such a kind is the rise and fall of the government led by military leaders during the early- to mid-1980s. Since that time, South Korean society has developed a remarkable degree of stability, which has helped to improve its ability to locate potential sources of upheavals and absorb their impact before they could cause a large-scale rupture of the social fabric. The same,

however, does not apply to events happening outside the country's border. South Korea has virtually no control over them. Moreover, the deeper the event is rooted in the power structure of international relations, the greater and the longer its impact on the country will be.

It is against this broad theoretical background that this article attempts to envisage the course of events up to the year of 2032. The main thesis is that environmental crises, particularly global climate change and regional pollution problems, will emerge as one of the most defining factors, in both positive and negative directions, for South Korea's domestic politics and foreign relations for the next twenty years. This is not to suggest that we can single out any one factor as the most decisive element for the future of a country. Korean unification is undoubtedly another critical element. But a prediction of such a political event requires too many actors to be taken into account at this stage. In contrast, as for environmental change, we have relatively more thoroughly gathered and better understood data, which will help us to make a less arbitrary projection for the future course of events.

This paper will briefly look at how serious the present environmental conditions are at global and regional levels. It then will proceed to identify a few things that are most likely to affect the course of events in South Korea during the next twenty years in relation to the environmental problems. Finally, I will outline what the Korean peninsula of 2032 will look like in view of the present environmental crises.

### **Global and Regional Pictures: The State of Environmental Crises**

For the last fifty years, the global surface temperature has been rising rapidly. In January 2010, NASA released data on Earth's surface temperatures showing that the decade ending in 2009 was the warmest on record.<sup>3</sup> In January 2011, NASA and NOAA (National Oceanic and Atmospheric Administration) announced jointly that 2010 was tied with 2005 for the hottest year ever in recorded human history.<sup>4</sup> The 2007 Intergovernmental Panel on Climate Change (IPCC) report made it clear that the trend toward greater global warming and climate change is unequivocal.<sup>5</sup> It pointed to Green House Gas (GHG) emissions as the villain, particularly carbon dioxide (CO<sub>2</sub>) and methane, which trap heat in the earth's atmosphere.<sup>6</sup> The reading of CO<sub>2</sub> atmospheric concentration as of February 2013 is 396.80 ppm (parts per million).<sup>7</sup> The most crucial question is how much margin there is before global warming reaches a critical point. The Copenhagen Conference of 2009 has offered a scientific case for keeping temperature rises below 2°C against the base year of 2000.<sup>8</sup> If the global community fails to keep the temperature rise within this limit by the end of this century, at least 20 to 30 per cent of life on the earth is expected to become extinct.

But, according to James Hansen, a NASA climatologist, a 20 to 30 per cent extinction of life is a disaster scenario. He argues that realistically the surface temperature rise should be capped at far below this level, preferably 1.0 degree. If this capping limit is translated into the CO<sub>2</sub> atmospheric concentration level, it should not exceed 450 ppm maximum.<sup>9</sup> Since there has been a steady increase of 2 ppm every year and the present concentration increase level is 396.80 ppm, assuming that the world will manage to lock GHG emissions at the present increase level, we have just less than 30 years before the

world hits what climatologists call a tipping point.

According to research by Joeri Rogelj and Malte Meinshausen, the stated aim at the Copenhagen Accord is not enough to halt global warming. They argue, 'the Copenhagen Accord has a stated aim of keeping global warming to below two degrees Celsius. However, according to countries' stated ambitions for reducing emissions, global yearly emissions of greenhouse gases will increase by 10 to 20 percent above current levels and reach amounts equivalent to 47.9 to 53.6 gigatonnes of carbon dioxide (GtCO<sub>2</sub>-eq) by 2020. This would result in a greater than fifty percent chance that warming will exceed three degrees Celsius by 2100... To be on track for meeting the 'below 2° C' climate target, global emissions of no more than 40 to 44 GtCO<sub>2</sub>-eq have to be achieved by 2020'.<sup>10</sup>

The environmental issue in East Asia should be looked at against this larger picture. The region has been contributing significantly to global warming. Developing countries in Asia account for about 48 per cent of the total carbon dioxide emission.<sup>11</sup> This is due to the relatively faster economic growth of the region compared with the rest of the world and, more specifically, due to excessive consumption of domestically produced cheap fossil fuels and unprecedented population growth. Import of used cars not fitted with exhaust gas purifying technology by less well-off countries aggravates the emission problem.<sup>12</sup>

There are environmental problems which affect the region directly, mostly taking the form of trans-boundary pollution which is very difficult to tackle due to geographic proximity. Polluted air spreads acid rain throughout East Asia. Of particular concern to this region, and to China and South Korea in particular, is the constantly rising level of sulphur oxides and nitrogen oxides concentration in the air.<sup>13</sup> The greatest portion of the pollution is accounted for by rapid industrialisation in the central and southwest regions in China and along the western coasts of both Koreas. Studies of acidity deposition in the region's air show that sulphur oxides and nitrogen oxides have brought extensive damage to forests in the three countries, together with some indirect effects involving soil acidification and mobilisation of toxic metals such as aluminium.<sup>14</sup>

Although the countries affected by acid rain have striven to curb the acidity level in precipitation including the establishment of EANET (Acid Deposition Monitoring Network in Asia), they have so far achieved no notable success.<sup>15</sup> There is also the problem of desertification in northern China and Mongolia, partly due to the increasing acidity of the air. It is from these deserts that yellow sand is blown away carrying toxic and carcinogenic chemicals through prevailing winds to the Korean peninsula and Japan. Fine, dry soil particles hazardous for human health carried in the winds often force primary and secondary schools in South Korea to close.<sup>16</sup>

Yet, pollution of LMEs (Large Marine Ecosystems) surrounding the Korean peninsula is equally a serious trans-boundary problem. Particularly the Yellow Sea LME has been subject to serious abuse such as oil leakage which is a constant feature of fishing activities in the Yellow Sea. In addition, the sea waters are filled with inland sources of pollution such as untreated sewage, toxic farming chemicals, and industrial waste, particularly those discharged from the industrial cities along the Chinese coast of

the Bohai Sea, and from the west coast port cities of North Korea.<sup>17</sup> South Korea also has been contributing significantly to the degradation of water quality. The country has carried out large-scale land reclamation projects along the west coast destroying biodiversity there. In addition, its fishery lets 33 to 66 per cent of feed dissolved in the waters without being utilized, and this causes eutrophication and more frequent occurrence of red tides.

South Korea's policy makers have been under heavy pressure to fight threats from deteriorating environmental conditions at these two levels - global and regional. These developments are closely intertwined with economic and industrial activities at global and regional levels. Unless the policy makers find an effective way of balancing economic growth with efforts to curb the cost involved in tackling these problems, they will continue to see the tendency of these external events limiting their policy options for the next twenty years.

### **Factors Likely to Shape South Korea's Options**

A number of factors may shape the future course of South Korea. In this paper, the discussion will be limited to four major ones: 1) the future of the international climate change regime, 2) China's response to environmental crises, 3) ecological response and change in North Korea, and 4) potential large-scale natural or human-made disasters in the Korean peninsula.

The first round of the Kyoto Protocol came to an end in 2012. The general consensus is that the UN Framework Convention on Climate Change did not achieve the desired level of emissions reduction under the protocol. The Copenhagen Accord of December 2009 also failed to produce an agreement for emission reduction enough to halt future global warming at below 2°C. Nor could the parties to the 2011 UN Climate Change Conference, held at Durban, produce a comprehensive, legally binding clause except agreeing to prepare such a deal by 2015 and make it effective by 2020.

Whether the parties to the Durban conference will be able to draft such a deal, of course, relies upon the outcome of the efforts to persuade the US and China to sign it. If the two most polluting countries opt out, or only accept a minimal emission reduction, it will not only fail to reduce the global carbon emission but also give other countries a good excuse to jump on the bandwagon. While such a scenario remains a possibility, it is also possible for the two environmental behemoths to play a greater role in tackling global warming for the next twenty years. This will be particularly the case given mounting international pressure, especially from low-lying nations or islands in equatorial regions such as Bangladesh, Indonesia, and Tuvalu, where the rise of sea level is threatening the life of a majority of their people or even the physical existence of the country as a whole.<sup>18</sup>

One of the core obstacles has been disagreement over the broad question of who should accept how much of the responsibility for the existing damage done to the earth's atmosphere and to take on the corresponding burdens.<sup>19</sup> Whatever the outcome of this debate, South Korea will no longer be able to avoid assuming greater responsibility in the next rounds of environmental negotiation. In 1992 South Korea ranked fifteenth in the global league table of CO<sub>2</sub> emission. For the seventeen years thereafter it became

the seventh biggest source of the GHG with the emission of 578.97 million tonnes per annum.<sup>20</sup> It is now even ahead of the United Kingdom, which ranks tenth with 532.44 million tonnes. Under the Kyoto Protocol the EU accepted a commitment to reduce GHGs by 8 per cent by 2008-2012, as measured against a baseline of the 1990 emissions level. Given that, within this overall 8 per cent EU abatement target, the UK has voluntarily accepted its obligation to reduce CO<sub>2</sub> emission by 12.5 per cent as an Annex I category state.<sup>21</sup> Given the present level of South Korea's annual carbon emission in comparison, it is almost certain that the Republic of Korea will have to accept a heavier reduction target. Undoubtedly, this will oblige South Korea to take more comprehensive policy measures domestically, which will seriously constrain economic and social policy options.

The China factor has both international and regional dimensions. China has been constantly under attack for failing to assume greater commitment to reducing its GHG emission. While it may have to take more drastic measures in reducing carbon emission, it will also face pressure from adjacent countries to take a more active stance in fighting regional air and water pollution. In particular, it will be under heavy pressure to control yellow sand by slowing down desertification in its northern territories. China itself has a large stake in the reforestation of the affected lands since air pollution in China has reached such a degree that it can no longer ignore the health hazards to the residents in its major northern cities.

The level of environmental damage is extremely high in North Korea. The damage to its soil, air, and seas is a classic case of the environmental disaster which was characteristic of the former Soviet satellites in Eastern Europe. The closed nature of North Korea's socio-economic system is one of the main causes of the environmental fiasco, together with the orientation of the planned economy towards excessive wastage of natural resources.<sup>22</sup> In addition, North Korea regularly has suffered famines since the mid-1990s which has led people to destroy its forests for securing additional farming land and for heating. At the moment, one-third of its woodland, equivalent to 1.6 million hectares, lies bare.<sup>23</sup>

Although it requires urgent reforestation, North Korea has no adequate financial resources to do so. The race for industrial development against South Korea for over a half-century has also contributed to the contamination of its rivers and soil, particularly the Taedong River which flows through its capital city. The rapidly degrading environmental condition will increase South Korea's stake in any future South-North Korean dialogue, due to the collateral damage to South Korea's own air and seas and to the related cost-sharing problems.

On the question of natural disasters, there is the possibility of the eruption of Mt. Paektu. In a conference held in 2010, Prof. Seong-hyo Yoon of Pusan University and Prof Jeong-hyeon Lee of the Institute of Science Education in South Korea argued that the evidence of a near-term eruption is mounting and the damage could turn out to be ten times greater than that caused by the 2010 eruption of Eyjafjallajökull in Iceland.<sup>24</sup> They presented a scientific case for the need of the East Asian countries to be seriously concerned about the disaster scenario. Furthermore any possible disaster involving nuclear power plants should also draw immediate attention, due to the geographic

proximity between the four East Asian countries.<sup>25</sup> But we cannot go deeper into these issues here. There are too many unforeseeable and unquantifiable factors involved for making any meaningful projection about the possibility of such events to happen and their consequences.

### **Possible Impacts of Environmental Crises**

The Office of the Prime Minister, in consultation with the Presidential Committee on Climate Change Response, coordinates environmental policies between the relevant ministries of the Republic of Korea Government including negotiation over pollution control and expenditure with other countries. However there is a serious degree of functional overlap between these administrative bodies.<sup>26</sup> There needs to be a comprehensive ministerial body which will centralise the required tasks in foreign affairs, economy, and environmental policy makings. This new body will also need policy inputs from various non-governmental organisations, such as corporate businesses, the media, religious groups, scientific communities, local and central political parties, and educational establishments. Policy outcomes will greatly depend on how effectively the government organises all these bureaucratic functions to balance the conflicting organisational interests.

But the structure of government is only one aspect of the many changes needed to improve the Republic of Korea Government's response to policy needs. Another is the need for a change in policy orientation. In September 2008, the Government announced that it would support massively the 'climate industry' as a new economic driving force.<sup>27</sup> The new vision, seeking to catch the two goals of environmental protection and sustainable economic growth within one policy package, will continue to remain a focal point for domestic and foreign policies of the South Korean Government during the next twenty years.

This vision will help to accelerate the expansion of alternative energy industries as well as industries manufacturing clean-energy products. For example, the production of electric and hybrid cars, together with related industries such as electric battery production and power-outlet-point networking, will constitute a dominant proportion of the total industrial output. At the same time firms and factories will be obliged legally to install emission-reduction equipment in most or all of the manufacturing processes. Compliance with the relevant laws and regulations will inevitably raise the production cost and constrain investment in research and development, leading potentially to long-term unemployment and other social problems. Production cost is all the more likely to increase, given the expected imposition on Korea of an Annex I category status and the associated obligation to reduce GHG emission.

### **Impact on Civil Society**

The rising environmental crises at global and regional levels is most likely to affect the way that the civil society evolves in South Korea. Over the last thirty years various civil society groups have emerged which, through education and the mobilisation of the general public, have brought an unprecedented degree of change to South Korean society. Only when we survey the whole gamut of the activities carried out by all of these civil society groups is it possible to describe how significant the impact on the

whole society has been and will be. However, this article will only focus on the civil society groups involved in the environmental movement and present them as a model case for the way civil society groups react to the stimuli coming from outside of South Korea's border.

The environmental group is the civil society group which has become the most influential in the wake of the environmental crisis, while also being the most susceptible to the impact of outside stimuli. In South Korea, the environmental movement was started by left-wing, anti-governmental activists as a way of finding an alternative strategy for attacking what they perceived as an oppressive government in the mid-1980s. Although South Korea suffered numerous pollution problems during the phase of industrial growth in the 1970s, a proper awareness of the importance of the environment emerged mainly after the launch of the Korea Institute of Pollution Issues (*Kongch'uryŏn*) in May 1982.<sup>28</sup> It was not the environmental activists or scientists but anti-government activists comprising students, labour union leaders, and radical left-wing political activists - who first raised their concerns about the environmental consequences of the Republic of Korea Government's industrial policies. They all rallied behind this institute in search of an alternative route to fighting against the brutal military government.

Naturally these first generation activists did not necessarily see environmental problems as an urgent issue. Some left-wing political activists even considered them as an unnecessary diversion of their energy, hence detrimental to the efforts to bring about a change of government. Yet the institute still drew its vitality primarily from an ideological line established along the slogan, 'Fight pollution, Achieve a nuclear-free peace'.<sup>29</sup> They took advantage of the clear line that divides the villains and the victims in the cases of industrial pollution to strengthen their strategic stance in attacking power élites. In some popular cases such as Pak Killye's pollution-induced pneumoconiosis (1988), the death of Mun Sŏngmyŏng from mercury poisoning (1988), the birth of babies with physical defects born around the nuclear power plant in Yonggwang (1989), and the building of a factory producing *toluene diisocyanate* (TDI) in Kunsan (1990), the institute played an important role in educating people about the rising level of industrial pollution. In the case of the planned building of a nuclear waste facility in Anmyŏn Island (1990), the systematic protest against it led to the abandonment of the plan by the South Korean Government.<sup>30</sup>

In the early 1990s the environmental movement entered a new phase. The Rio conference in 1992 gave a new impetus to South Korea's environmental organisations that now started to sprout throughout the country, and opened up the vision of the local groups to the wider questions of the planetary ecological condition. As a result, the socialist and anti-capitalist ideological tenet of the existing environmental movement gave way to a more practical and more ecologically oriented one.<sup>31</sup> Such a new direction received a ready welcome from various religious groups such as Protestant Christians, Catholics, Buddhists, and Wŏn Buddhists. The religious leaders began to seek a common understanding of life and the coexistence of all life forms as a way for the peaceful integration of humanity with its natural habitat.

Initially, politically motivated activists found it difficult to harmonise their political



agenda with this new trend in the ecological movement. Yet, as they assimilated to the new perspective, they became a driving force for various national campaigns to protect rivers and mountains from various commercial and Government-funded development plans which had had a destructive impact on them. Some were unsuccessful such as the attempt to thwart the construction of Sihwa Lake (1996-1998) or Saeman'gŭm (1998-2006). But they managed to force the Government to drop some major projects such as the construction of the Tong-gang River Dam (1998-2000), nuclear waste sites in Anmyŏn-do (1990) and Pu'an (2003), and the Grand Canal Project (2008).<sup>32</sup>

During the last thirty years of the environmental movement, two things stand out. The first is the emerging role of religions. As South Korean religious groups became aware of the theological/religious implications of growth-focussed economic policies within their own belief systems, there has been growing collaboration in protesting against the destruction and deformation of terrains and waterways. The most dramatic example of this inter-religious collaboration was the march of 305 km from Saeman'gŭm to Seoul led by Catholic, Protestant, Buddhist, and Wŏn Buddhist leaders. It took place from March to May, 2003 in protest against the Government-led Saeman'gŭm Project.<sup>33</sup> The convergence between religions in Korea emerged as a part of a larger social process in which various commercial sectors, religions, scientific communities, and political circles increasingly sought a common space for dialogue, and concerted action on serious environmental issues.

The second element is the increasing collaboration between Korean and foreign environmental organizations. As mentioned earlier, since Korean activists attended the 1992 United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro the hitherto politically-oriented movement began to look at the environmental crises from the totality of its impact on the planetary ecology. Due to this broadened ideological horizon, the period often saw an alliance between domestic and foreign environmental groups in fighting against Government policies, cleaning up oil spillage along its coasts, or holding joint workshops to develop intellectual positions such as the Korean-German Symposium on the Saeman'gŭm region held from 4 to 6 March, 2003.<sup>34</sup>

The two converging trends, on the internal and external fronts, are likely to continue to grow during the next twenty years. Particularly, challenges posed by climate change are likely to intensify collaboration between South Korea's civil society groups with international environmental organizations. While the Government will be fighting for a reduced share of the burden and greater influence in international climate control regimes, civil society groups, free of these constraints, will demand more radical policies from the Government, some of which may originate from international ecological movement organisations. Peace and life has been a key ideological tenet which facilitated cooperation between South Korean and foreign green movement groups. In turn eco-philosophy has been instrumental in bringing religions in South Korea together toward concerted actions based on the grand principle of the coexistence of all life.<sup>35</sup> The two processes of integration will keep influencing each other during the next two decades, thus increasingly constraining the Government's economic and industrial policy options.

### **South Korea and Political Convergence in East Asia**

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On the external front, South Korea will be able to expand its environmental projects abroad and by doing so offset losses from the increasing economic and industrial costs that will follow her obligation to comply with various regulations under international climate control regimes. South Korea will all the more actively use emission reduction mechanisms provided under the Kyoto Protocol. Starting in Australia in 1993, Korea participated in a number of afforestation and reforestation projects abroad, in New Zealand, Vietnam, Indonesia, and Paraguay.<sup>36</sup> Korea is most likely to expand such projects, both to earn surplus carbon credits and to build up expertise in the field. Moreover, if North Korea gathers momentum for economic growth in greater integration with the world economic system and environmental control regimes in East Asia, it will actively seek Clean Development Mechanism (CDM) projects for industrial waste treatment and air purification. Some air and water treatment technologies developed by South Korean firms have reached the technological frontier giving them a competitive edge against their Japanese or European counterparts.<sup>37</sup>

Korea may actively seek CDM projects in China as well. China has been notoriously reticent for hosting CDM projects and, instead, preferred bilateral programmes for fear of losing control.<sup>38</sup> Yet, this will not be always the case. The Republic of Korea has already succeeded in procuring CDM projects in the area of hydraulic, solar, and wind power plants in China in the last few years.<sup>39</sup> Moreover China is under increasing pressure to agree to the compulsory reduction of GHG emissions, and so during the period leading up to 2032, China is most likely to take more aggressive measures to curb its GHG emission, which will significantly weaken its reservation toward multilateral negotiation. In this circumstance, any drastic moves by China towards tackling its environmental problems will offer South Korea more chances of procuring CDM projects.

Crises often bring enemies together, and those common threats do not have to be political or military. In March 2007, North Korean officials suddenly approached South Korea and requested provision of earthquake monitoring equipment. Around that time, there had been talk about the eruption of Mt. Paektu. In March 2011, experts from both Koreas met in Panmunjŏm and agreed to conduct joint research on Mt. Paektu including field investigation and joint conferences.<sup>40</sup> These events are merely an example. The need to tackle common natural disasters has tended to bring convergence among the four East Asian countries, which is attested by the sheer growth of consultation bodies and regional contingency plans.

Equally, the last twenty years has seen the greater proliferation of regional organisations in the field of pollution control than in any other aspect of international relations in East Asia. The first formal meeting of high officials on environmental crises in Northeast Asia was held in 1993. The officials agreed that the North-East Asian Sub-regional Programme for Environmental Cooperation (NEASPEC) should be established under the supervision of the United Nations Economic and Social Commission for Asia and the Pacific. Since then, NEASPEC has been involved in pollution reduction, nature conservation, and energy efficiency projects in the region.<sup>41</sup> The tenth meeting of high officials met in Okinawa, Japan in 2000, facilitating the establishment of various bilateral and multilateral consultative bodies for tackling common environmental problems in the region.<sup>42</sup>

Although there have been ever-widening networks of mutual consultation and support among East Asian countries, there is no guarantee that this trend of convergence will continue to grow without facing serious challenges. Firstly, many of the aforementioned transnational pollution problems require effective legal agreements and a stable political structure in which such agreements can be implemented, and this demands a substantial degree of relinquishment of national sovereignty. However, no East Asian government is likely to renounce even a small part of its own political autonomy to tackle the common pollution problem at this stage.<sup>43</sup> Secondly, more fundamental than the first point is the reluctance of the East Asian states to shift from the fossil fuel-based model of economic development to one more congenial to sustainable growth. Any delay in dealing with regional sea and air pollution and halting the rising CO<sub>2</sub> emission will soon result in a situation wherein the cost of reversing the trend of environmental degradation far outweighs the benefits, and could even fail to stop run-away environmental degradation.<sup>44</sup>

Yet, these two problems are overshadowed by a third problem. To determine each nation's share in the burden will be one of the most difficult tasks for the policy makers of the region. The problem will be particularly acute in the case of long-range air pollutants. South Korea and the governments of neighbouring countries do not have the same advantage as European states which have achieved economic parity and a fair level of political integration before they embarked on negotiating pollution control. The East Asian states have yet to form a comparable political and economic platform before embarking on an effective negotiation over burden sharing. Moreover the isolation of North Korea in the context of North-South Korean military confrontation has created a hole in what is essentially a multilateral platform, obstructing scientific investigations of pollution cases or negotiations involving all the parties affected in Northeast Asia.

In spite of all these adverse factors, there is a strong prospect of regional convergence to continue during the next two decades. The rapidly deteriorating environmental conditions at global and regional levels are unquestionably one of the most pressing concerns to the governments. In particular the level of maritime and air pollution in East Asia has become so serious that policy makers can no longer ignore these problems. As Paul G. Harris rightly observes, the region is most likely to show the pattern of assimilating domestic policies, environmental policies in particular, to the demands of the international climate control regime and to the mutual interest of the East Asian countries.<sup>45</sup>

Even with the most difficult question of burden sharing, the East Asian countries are not incapable of resolving these problems. The United Nations has been closely cooperating with East Asian countries over pollution problems in this region, and is likely to expand its role for facilitating bilateral and multilateral negotiations. Moreover, the experience of negotiations among EU member states can set a good model for East Asia to follow. For example, the EU member states set up the first Sulphur Protocol (Helsinki, 1984) in order to reduce sulphur dioxide (SO<sub>2</sub>) emissions. Beginning with a simple principle of uniform percentage emission reduction targets, its negotiations over time evolved a more sophisticated equity principle which aims at achieving a given deposition target

whereby burdens are distributed by equalising the marginal costs of deposition reduction across sources or parties.<sup>46</sup> Parties to the East Asian pollution control regime could adopt a similar model and develop it into a formula acceptable to the member states with all the cost and benefit data of each state adequately counted in.

### **Conclusion**

The scenario presented here features both optimistic and pessimistic consequences in a complex matrix. How one will cancel out the other is difficult to judge, but events that are to be woven out of these two opposing forces will present the Republic of Korea with a full range of opportunities as well as challenges. Domestically, environmental crises will force various social sectors to seek a common solution, although the process may not necessarily produce harmony between them. On the external front, the same problems will require the convergence of national goals between South Korea and its neighbours in East Asia. Although the negotiation process may inevitably harbour disagreements and conflicts as well, in the long run the shared threat may help to push the East Asian countries towards where Europe was half a century ago when it began to form an economic and political community. While Europe was haunted by the common enemy of another world war, East Asia is now facing the common enemy of systemic collapse.

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### **Endnotes**

<sup>1</sup> On the impact of the financial crises on the present South Korean economy and society, see Meral Karasulu et al, *Ten years after the Korean Crisis: Crisis, Adjustment and Long-run Economic Growth (Korea)*, and John Authers, *The Fearful Rise of Markets: A Short View of Global Bubbles and Synchronised Meltdowns*.

<sup>2</sup> For example, see Kenneth N. Waltz, *The Theory of International Politics*.

<sup>3</sup> <http://earthobservatory.nasa.gov/IOTD/view.php?id=42392>.

<sup>4</sup> <http://www.nasa.gov/topics/earth/features/2010-warmest-year.html>.

<sup>5</sup> The IPCC Climate Change 2007: Synthesis Report, p. 30.

<sup>6</sup> Ibid, p. 36.

<sup>7</sup> <http://www.co2now.org>.

<sup>8</sup> United Nations, Framework Convention on Climate Change, 'Report of the Conference of the Parties on its Fifteenth Session, *FCCC/CP/2009/11/Add.1*, March 30, 2010. South Korea's official proposed action at Copenhagen 2009 was to reduce emissions unilaterally by 4 per cent below 2005 levels by 2020.

<sup>9</sup> James Hansen, 'Tipping Point: Perspective of a Climatologist', p. 13.

Hansen believes that the safe level of atmospheric carbon dioxide is no more than 350

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ppm (parts per million), or even less. See also his article ‘Twenty Years Later: Tipping Points Near on Global Warming’ posted in *Huff Post Green*, 23 June, 2008.

<sup>10</sup> <http://www.pik-potsdam.de/news/press-releases/archive/2010/copenhagen-accord-misses-2b0-c-climate-target>.

<sup>11</sup> Yoshiki Ogawa, ‘East Asia’s Energy and Environmental Problems’, p. 38.

<sup>12</sup> *Ibid*, p. 29.

<sup>13</sup> H. Shang, Y-K. Kim, and D. Xu, ‘Forestry Problems and Air Pollution in China and Korea’, p. 133.

<sup>14</sup> *Ibid*.

<sup>15</sup> Mika Mervio, ‘The Environment and Japanese Foreign Policy: Anthropocentric Ideologies and Changing Power Relationships’, p. 55.

<sup>16</sup> *Chosŏn ilbo*, 8 March, 2008.

<sup>17</sup> Alfred M. Duda and Kenneth Sherman, ‘A New Imperative for Improving Management of Large Marine Ecosystems’, pp. 818-19. See also Jun She, ‘Pollution in the Yellow Sea Large Marine Ecosystem: Monitoring, Research, and Ecological Effects’.

<sup>18</sup> For the impact of sea-level rise on these countries, see Yasuko Kameyama, ed., *Climate Change in Asia: Perspectives on the Future Climate Regime*, pp. 3, 61, 109, 240.

<sup>19</sup> For conflicting views about responsibility, see Howard A. Latin, *Climate Change Policy Failures: Why Conventional Mitigation Approaches Cannot Succeed*, pp. 117-30.

<sup>20</sup> IEA Statistics: CO2 Emissions 2012, <http://www.iea.org/co2highlights/co2highlights.pdf>.

<sup>21</sup> Parliament of the United Kingdom, House of Commons Climate Change Bill [HL] Bill 97 of 2007-08.

<sup>22</sup> Egbert Tellegen, ‘Environmental Conflicts in Transforming Economies: Central and Eastern Europe’, p. 76.

<sup>23</sup> Jae-yong Choi, *Tongbuk-A hwan ’gyŏng hyŏmnyog-ŭi hyŏnjae-wa mirae* [The Present and Future of Environmental Cooperation in East Asia], p. 29.

<sup>24</sup> *Chosŏn ilbo*, 13 November, 2010.

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<sup>25</sup> The nuclear accident at Fukushima is a classic case, but China and Korea are not immune to the occurrence of a similar disaster. There already has been an accidental power cut at the nuclear power plant at Kori, South Korea on 9 March, 2012. See *Chosŏn ilbo*, 15 March, 2012.

<sup>26</sup> Currently, the South Korean Government has allowed the proliferation of institutions and ministerial bodies dealing with environmental issues. These institutions include the Ministry of Environment, the Ministry of Knowledge Economy, the Ministry of Education, Science, and Technology, The Korea Eco-Products Institute, the Korean Agency for Technology and Standards, the Korea Institute of Environmental Science and Technology, and the Regional Environmental Technology Development Centres.

<sup>27</sup> To achieve this policy goal, the PCCCR adopted the following action plan in September 2008: 1) the promotion of energy saving and the improvement of energy efficiency in industry, 2) more than doubling research and development investment in climate change, and 3) the development of climate-friendly industries and the promotion of the export of their products. The reference for this decision is found in a statement of 2008 from the Prime Minister's Office referred to in English as 'Comprehensive Plan on Combatting Climate Change' which is contained in the document *Task Force on Climate Change* (18 September 2008). This is quoted in Jae-Seung Lee, 'Coping with Climate Change: A Korean Perspective', p. 362.

<sup>28</sup> Shin, Dong-ho, 'Konghae ch'ubang, panhaek p'yŏnghwa-ŭi kil: 1982-1992' [Driving Out Pollution, A Road to Anti-Nuclear Peace: 1982-1992], p. 138.

<sup>29</sup> Ibid, p. 140.

<sup>30</sup> Ibid.

<sup>31</sup> Koo, Do-wan, '1993-2012, Hwan'gyŏng undong-ŭl nŏmŏ saengmyŏng p'yŏnghwa-ŭi sidae-ro' [Moving beyond the Environmental Movement towards the Age of Life and Peace: 1993-2012], p. 144.

<sup>32</sup> Ibid, pp. 145-46.

<sup>33</sup> On the implications of the Saeman'gŭm Project for the environment and the economy, see Hong, Wook-hee, *Saeman'gŭm: Samjowŏn-ŭi hwan'gyŏng nonjaeng* [Saeman'gŭm: A Three Trillion Wŏn Environmental Dispute], Park, Soonyeol, *Pulman-ŭi Saeman'gŭm* [Unhappy Saeman'gum], Hanhui Ham et al, *Miwan-ŭi kirok: Saeman'gŭm saŏp-kwa ŏmin-dŭl* [An Unfinished Record: The Saeman'gŭm Project and the Fishermen], Yoon, Pakkyong, *Saeman'gŭm: kŭgos-en yŏsŏng-dŭri itta* [Saemangŭm: Women Are There].

<sup>34</sup> The proceedings of the symposium have been included in Citizens' Institute for Environmental Studies, *After the Forced Reclamation of Saeman'gŭm*.

<sup>35</sup> Recently, scholars representing various Protestant churches, Roman Catholics, Buddhists, Wŏn Buddhists, and Confucianists published a series of research books in

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search of a common understanding of life and peace as the basis of a concerted environmental movement. For the most comprehensive treatment see Taehwa munhwa ak'ademi, *Chonggyo sahoe tanch'edur-ŭi hwan'gyŏng hwaltong hwalsŏnghwa-e kwanhan yŏn'gu* [A Study on the Promotion of Environmental Movements by Religious Organisations].

<sup>36</sup> Jae-yong Choi, op. cit., p. 27.

<sup>37</sup> Ibid, p. 43.

<sup>38</sup> Paul G. Harris, *Global Warming and East Asia*, pp. 86-108.

<sup>39</sup> Jae-yong Choi, op. cit., p. 30.

<sup>40</sup> *Tong-A ilbo*, 29 March, 2011.

<sup>41</sup> Miranda A. Schreurs, 'Problems and Prospects for Regional Environmental Cooperation in East Asia', p. 210.

<sup>42</sup> Other organizations and consultative meetings include ECO-ASIA, 1991; The Northwest Pacific Action Plan, 1991; Acid Deposition Monitoring Network in East Asia, 1992; The Northeast Asian Conference on Environmental Cooperation, 1992; Joint Research Project on Long-range Trans-boundary Air Pollutants in Northeast Asia, 1995; TumenNET, 1995; Tripartite Environmental Ministers Meetings, 1999, including the Environmental Congress for Asia and the Pacific. See Jae-yong Choi, op. cit., p. 6.

<sup>43</sup> Schreurs, op.cit., p. 221.

<sup>44</sup> Ibid.

<sup>45</sup> Harris, op. cit., p. 12.

<sup>46</sup> Giles Atkinson, *Equity Burden Sharing and Pollution Abatement in Europe*, p. 2.

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