

Disaster Management and Institutional Change in the DPRK: Trends in the Songun Era

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One cannot enter the same river twice. Every time one looks at North Korea, on the surface it appears boringly the same. Its life flows in the same predictable direction, accelerating at narrow rapids in well known locations that shake up internal stability and generate international agitation. Once these easily identifiable but hard to overcome bottlenecks are cleared, the stream of life flattens, slows, and returns to the acceptable order. One can detect the signs of some subterranean trends—economic, social, demographic, political, and cultural trends—shaping the direction and pace of life in the country and affecting its relationships with the outside world. Interpretation of these trends is subjective, and frame of reference is important: neither demonization nor adulation nor ignorant arrogance increase our understanding of reality.

Analysis of Trends and Shocks in North Korea

These trends shape the path of development in a rather predictable way until some unexpected shock disrupts existing relationships and dependencies or alters the path altogether. Some of these shocks are man-made, and others are caused by Mother Nature. During the past two decades, North Korea (the Democratic People's Republic of Korea or DPRK) and its Songun generation have experienced a number of such shocks, including a foreign policy crisis and a dramatic deterioration of the country's security environ-

ment precipitated by abandonment by strategic allies in 1990–92; the virtual shutdown of foreign trade and the ensuing macroeconomic collapse of the first half of the 1990s; the death of the nation's founding father, Kim Il-sung, and the subsequent regime legitimacy crisis in the mid-1990s; the government's failure to deliver basic services that led to a mass exodus of starving and disaffected people to China in the late 1990s; and the nuclear crisis of 2002 resulting in increased international sanctions and isolation.

In addition, the country suffered from the natural disasters of 1995–97 that caused countless deaths from famine and enormous infrastructure damage. It was regularly pounded by typhoons, tidal waves, earthquakes, droughts, and floods. It was also exposed to periodic surges in traditional health risks like tuberculosis and measles and outbreaks of national epidemics like the bird flu and the SARS scare.

This paper is designed to explore how the DPRK responded at the national, provincial, and local levels to a selected number of such shocks: who got involved on the government and society sides, when actions were taken, what initial policy responses and next-step plans were developed, how they were implemented, and, finally, why the government did what it did. I will limit the scope of this study to seven case studies. I will investigate who, what, when, how, and why with regard to the following shock events: the floods

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of 1995–96 and the drought of 1997, the typhoon Prairoon and tidal wave that hit Korea on 30 August 2000, severe flash flooding that occurred on 9–10 October 2001, flash floods of 4–5 August 2002 and typhoon Rusa on 31 August–1 September 2002, the SARS scare in 2003, the Ryongchon train explosion accident on 22 April 2004, and the bird flu outbreak in the spring of 2005.

Floods of 1995–96 and Drought of 1997

During 1995–97, when the DPRK was mourning the passing of the nation’s founder, Kim Il-sung, it suffered one of the worst natural disasters since the end of the Korean War. The floods of 1995¹ and 1996 wiped out nearly one-third of the harvest (approximately 1.5 million tons of grain), destroyed 359,936 hectares of arable lands out of a total of 650,000 hectares and most of the granaries,² and devastated thousands of kilometers of roads, railroads, irrigation networks, river embankments, and hundreds of dams and bridges as well as tens of thousands of houses.³ In all, 5.2 million people were affected in 145 counties in eight provinces out of the country’s 200 counties and nine provinces. Seventy deaths were reported even though the armed forces were mobilized to rescue those marooned on rooftops and high ground. A half million persons (approximately 100,000 families) were made homeless. The drought that hit the fertile west coast in June–August 1997 enormously exacerbated the damage done to the food security, land, and agricultural infrastructure in the previous two years. The total damage was estimated to be up to 15 billion U.S. dollars. Subsequently, the country suffered the worst ever humanitarian disaster caused by several years of famine that took away hundreds of thousands of lives. In the official North Korean propaganda, this period became known as the “arduous march.”

This series of disasters was one of the first shock events of Kim Jong-il’s era. It was the perfect storm that nearly ruined the country. The government failed miserably to prevent the disaster, to respond to the crisis, and to mitigate its consequences. If anything, this was a model case of how not to run a country. Three years of official mourning was a time of great political uncertainty and policy immobility. As the top political leadership was in a state of virtual coma, the rest of the government institutions, traditionally stovepiped and excessively bureaucratized, failed to react innovatively and on their own initiative; they were practically paralyzed, too.

The Administrative Council under Premier Kang Song-san’s leadership was stuck in the old ideological dogmas and proved to be out of touch with reality, unable and unwilling to respond to the unfolding crisis. The State Planning Commission and the Ministry of Finance lost control of

the operational situation and seemed to have absolutely no idea what remedies were needed in the medium term. The line ministries and commissions concerned—Agriculture, Public Health, Food Procurement and Administration, City Management, Land and Environmental Protection—were unprepared, underresourced, overwhelmed, and incapable of handling the crisis on their own. The National Red Cross Society, skilled in inter-Korean negotiations on family reunions and other humanitarian issues, proved to be unprepared to procure and deliver humanitarian relief to the North Korean people in emergency. When the country was badly hit with very destructive natural disasters three years in a row and the authorities did little to respond, the price of government ineptitude in human lives was very high.

The damage done to the population’s health, the national economy, and the environment was enormous, and the government had very little idea how and where to start to repair it. Only in late 1997–early 1998, did the top political leadership and the government begin to act to make hard and groundbreaking decisions. The policy choices made during this trying period laid the new path for subsequent policy responses to comparable shock events.

The government response to this humanitarian disaster can be categorized into four main phases—disaster relief (1995–97), damage recovery (1998–2000), sector rehabilitation (2001–05), and moves toward sustainability (2006–10). During the first phase, in view of the magnitude of the disaster, the government made an extraordinary decision to appeal for international (in other words, UN and Western) humanitarian assistance, which for decades had been taboo in the *juche*-based society. This principled decision opened the door for broad, albeit controversial, cooperation between the hermit kingdom and the international humanitarian community for many years to come.

The United Nations Department of Humanitarian Affairs (DHA) first received a request from the Permanent Mission of the DPRK in New York on 23 August 1995 and dispatched a United Nations Disaster Assessment and Coordination Team (UNDAC) to the DPRK on 29 August–9 September 1995. The team led an interagency assessment mission of World Health Organization (WHO), UN Children’s Fund (UNICEF), World Food Program (WFP), and Food and Agriculture Organization (FAO) staff, with support from the United Nations Development Program (UNDP), to the worst affected parts of the country and made initial recommendations in a joint UN appeal issued on 12 September 1995 for a total of just over 15 million U.S. dollars, later amended to just over 20 million U.S. dollars.⁴ In its approach to the international community, the DPRK government has been cautious and careful in presenting only the most urgent needs, not wishing to present so-called shopping

lists. This conservative approach to requesting external assistance increased the eventuality of a response on the part of donors that was more positive than it was to the initial UN appeal of September 1995 for emergency assistance in the immediate aftermath of the floods.

To procure and manage international humanitarian assistance, the government established the Flood Damage Committee⁵ in 1995 (which was renamed the Flood Damage Measures Committee in 1997) under the Ministry of Foreign Affairs (coordinated by Deputy Foreign Minister Choe Su-hon, who was concurrently chairman of the Korean Committee of the FAO). The distribution of food aid and implementation of the food-for-work program that concentrated on rebuilding the damaged roads, dams, and river embankments; excavating rivers; reconstructing grain storage facilities; and organizing local food processing were visible manifestations of the unprecedented cooperation with the international community.

Since the collapse of the agricultural sector was determined to be the central culprit of the deepening economic crisis (referred to as the “main front of socialist economic construction”), the government made the formulation and implementation of a new, more viable agricultural policy one of its top priorities. In mid-1996, the government instituted important agricultural reforms, which were designed to boost agricultural output by creating new incentives for farmers. Following the earlier Chinese model, the authorities introduced the “small-unit farming system” based on the family unit (composed of 1–3 families with 7–18 people in each). To stimulate farmers’ morale, the standard annual output target was lowered from 7.9 tons of rice per hectare in 1995 to 6.3 tons per hectare of rice in 1996. Also, free disposal of rice surplus at farmers’ markets was finally allowed (in the past, the state would buy all the surplus at 60 chon per 1 kilogram of rice and 50 chon per 1 kilogram of corn). Despite these policy innovations, there was little supply-side response until 1998–99.

During the second phase of damage recovery (1998–2000), the government adopted the Agricultural Recovery and Environmental Plan (AREP),⁶ developed in close collaboration with the UNDP, which set forth the goal of reaching full recovery of the agricultural sector by 2001–02, with the minimum food consumption requirements to be met by domestic production. As the DPRK’s engagement with the international humanitarian community expanded in 1998 and Pyongyang intensified its cooperation with FAO, WFP, WHO, International Federation of Red Cross Societies (IFRC), UNICEF, UNDP, and dozens of humanitarian relief nongovernmental organizations (NGOs), the North Korean government decided to reorganize the Flood Damage Measures Committee into the Flood Damage Reha-

ilitation Committee (FDRC) and make it a stand-alone government agency (run by Vice Chairman Ri Yong-sok and represented before the international community by Jong Yun-hyong, director for external affairs). The FDRC was in charge of screening out and dealing with the international humanitarian actors interested in entering the country as well as procuring and channeling international humanitarian assistance from abroad to relevant domestic ministries and local organizations. Although the FDRC was reported to provide personnel (originally from the Ministry of Foreign Affairs [MFA], Workers’ Party of Korea Central Committee [WPK CC], and Ministry of State Security [MSS] on loan to other ministries, it did not have any interagency coordination authority with regard to humanitarian relief activities in the affected areas.

In 1996–97, Kim Jong-il purged the legacy agricultural establishment at the Agriculture Department and Agricultural Policy Control Department at the WPK CC, allegedly executing the former WPK secretary for agriculture So Kwang-hui and 17 senior officials for mismanagement and corruption.⁷ At the first session of the 10th Supreme People’s Assembly of the DPRK held on 5 September 1998, the Agricultural Commission was reorganized into the enhanced Ministry of Agriculture. Ri Ha-sop, who had been acting chairman of the Agricultural Commission since the death of his predecessor, Han Ik-hyon, in 1997, was appointed the new minister of agriculture⁸ but soon was replaced with Minister Ri Kyong-sik.⁹

Finally, in 1998, Kim Jong-il launched the so-called agricultural revolution, which encompassed a shift to double cropping and cash crops; cultivation of potatoes as staple food; restoration of the livestock base through the initiation of a “goat project” and construction of new pig farms, mass-production chicken plants, ostrich farms, and fisheries farms; as well as the restoration of an electricity-fed irrigation system. Major arable-land reclamation and waterway construction projects (Kaechon–Lake Thaesong Waterway in South Hamgyong, Paekma-Cholsan Waterway in North Pyongan, Miru Plain Waterway in North Hwanghae) were initiated throughout the country. At that time, North Korea relied heavily on international food aid and technical assistance, Western supplies of seeds, and provision of fertilizers by South Korea.

Among important institutional developments during the second phase was the establishment of the DPRK Red Cross Disaster Preparedness Center on 23 April 1999 with valuable technical assistance from the IFRC. Deputy Minister of Public Health Choe Chang-sik was appointed its first director. Also, in late 1998, the Supreme People’s Assembly passed the Law on Land and Environment Protection Control, which divided the Ministry of City Management,

Land, and Environment Protection headed by Minister Choe Jong-gon¹⁰ into two separate ministries—the Ministry of City Management still headed by Minister Choe Jong-gon and the Ministry of Land and Environment Protection with newly appointed Minister Jang Il-son at the helm. This decision underscored the significance of rural rebuilding, land reclamation, environmental restoration, and irrigation system development projects in the years to come. Minister of Forestry Ri Sang-mu and Minister of Public Health Kim Su-hak were able to retain their positions during both reorganizations in 1998 and 2003.

During the third phase of sector rehabilitation (2001–05), the North Korean government adopted the Midterm Plan for Agricultural Rehabilitation, which addressed not only immediate post-flooding rehabilitation requirements but also longer-term investment needs of the agricultural sector. It emphasized the need to shift from the electricity-fed irrigation system dependent on electricity supply, motor pumps, and costly maintenance to the gravity-fed irrigation system and the need to shift from fertilizer imports to reliance on local fertilizer production and the use of bio-fertilizers. Throughout the period, grain production continued to recover, with the 2005–06 harvest of 4.8 million tons of grain being the largest in more than a decade, albeit still below the level of self-sufficiency.¹¹ Improving prospects of the national agricultural sector led the government in late 2005 to conclude that the country no longer needed emergency food aid from the international community; thus, it requested developmental assistance instead.

It took the North Korean government almost 10 years to overcome the horrible consequences of the natural and man-made shocks that struck it in the mid-1990s. Since 1995, North Korea has received from the international community via the WFP more than four million tons of food to feed 6.5 million people, or more than one-quarter of its population,¹² more than one million tons of fertilizer from South Korea, and almost five million tons of fuel via the Korean Peninsula Energy Development Organization (KEDO).

It is noteworthy that the North Korean press rarely mentions the name of Kim Jong-il, who was mourning his father for three years, in the context of the “arduous march” and natural calamities of the second half of the 1990s. It is the foreign humanitarian and energy aid that proved to be the lifeline that saved the starving and freezing country from collapse. The DPRK’s growing engagement with the international humanitarian community also preconditioned the emergence of some important institutional changes in the national policy priorities and decision-making processes. The government set up a new bureaucratic structure—the FDRC—as a subcabinet-level gateway to manage all for-

eign humanitarian aid. New agricultural, health, land, and environmental policies were developed and implemented. Corresponding line ministries were revamped and rejuvenated. New disaster response mechanisms were put in place and further refined during the subsequent natural disasters and man-made calamities discussed below.

Typhoon Prapiroon of 30 August 2000

On 30 August 2000, the DPRK was hard hit by typhoon Prapiroon followed by torrential rains, a tidal wave, and landslides. This natural disaster affected 11 cities and seven out of nine provinces, including North and South Hwanghae Provinces, Kangwon Province, North Pyongan Province, Ryanggang Province, and North and South Hamgyong Provinces. The DPRK Central Statistics Bureau estimated the total amount of damages at 6.1 billion U.S. dollars. Forty-six people were reported dead; and 125,000 dwellings were inundated or destroyed, with 29,000 completely demolished and thousands swept away. A torrential rain and typhoon in Kangwon Province and North and South Hamgyong Provinces destroyed 1,630 kilometers of roads, 1,930 bridges, and 250 railway sections, cutting off traffic along the northeastern littoral and between the east coast and the rest of the country for scores of days. A subsequent landslide completely destroyed more than 160 sections of railways and roads.

These natural disasters caused great damage to the different sectors of national economy, including agriculture, mining, and transportation. The agricultural regions in the bread-basket plain areas in North and South Hwanghae Provinces and North Pyongan Province were hit particularly hard, with tens of thousands of hectares of crops washed away, buried, and blown down. The grounds of concentrates (large open-air yards where anthracite and ore concentrates are stored) were inundated; entire coal mines were flooded; coal yards in mines were submerged under water; and a lot of mining property, plant, and equipment were damaged beyond repair.¹³

On 31 August 2000, Kim Jong-il returned to Pyongyang from a tour of Jagang Province,¹⁴ one of the two provinces not affected by the typhoon. On 1 September 2000 he met with the visiting Republic of Korea (ROK) minister of unification, Pak Jae-gyu, the head of the ROK delegation at the second round of the North-South ministerial talks, but reportedly they did not discuss the ongoing natural calamity. News accounts alluded to the fact that the annual 9 September anniversary celebration of the DPRK’s founding had been scaled back for some unidentified reason. On 15 September 2000, Kim Jong-il received a visiting Chinese delegation led by Dai Bingguo, member of the Chinese

Communist Party Central Committee and head of the international liaison department; they noted the damages inflicted on the country by typhoon Prapiroon. On 20 September 2000, Kim Jong-il in the company of his top military commanders¹⁵ toured the hard-hit South and North Pyongan Provinces and South Hwanghae Province to personally assess the losses and damages and give on-the-spot guidance to the mobilized Korean People's Army (KPA) units.

The government first officially reported the news of the natural disaster and its preliminary assessment of the inflicted damages three weeks after the typhoon hit, on 22 September 2000. The only mention of the government response at that time indicated that "large quantities of materials and manpower were directed to the rehabilitation work."¹⁶ It appears that the DPRK Red Cross Society was put in charge of the government response and worked together with the FDRC and IFRC to implement the government response.

As a matter of initial response, the government dispatched a joint assessment team led by the deputy secretary general of the DPRK Red Cross and composed of the director of its Disaster Preparedness and Response Department (also known as the Disaster Preparedness Center) and a resident representative of the IFRC. The team visited South Hamgyong Province and talked to the local officials at the provincial and county Red Cross chapters. Following the initial assessment, the DPRK Red Cross decided to provide the affected populations with immediate relief, which included the distribution of first aid kits and establishment of village first aid posts, distribution of water purification tablets, the repair of village water and sanitation systems, distribution of basic relief supplies such as blankets, cooking sets, winter clothing, high-energy biscuits, and so on, from pre-positioned stocks in provincial and central Red Cross warehouses. They also provided plastic sheeting to families in need to enable do-it-yourself shelter repair. The FDRC focused the central government's resources, including the centrally procured construction materials and mobilized KPA units, reconstructing the damaged infrastructure, repairing roads, and rebuilding bridges.

At the same time, the DPRK government launched a fund-raising campaign in the international community. In mid-September, the DPRK Red Cross officially requested humanitarian assistance from the IFRC, and on 19 September 2000 the IFRC issued a donor appeal for 950,000 Swiss francs (532,571 U.S. dollars) in order to get assistance focused on shelter rehabilitation for 12,000 homeless people in the following three months. During the second round of the North-South Red Cross talks held in Kosong on 20–23 September 2000, where humanitarian issues such as reunions of divided families were discussed, the DPRK

Red Cross asked its ROK counterpart for humanitarian relief for typhoon victims.¹⁷ Also, the DPRK Ministry of Public Health requested assistance from its traditional international partners and received some aid equipment from UNICEF on 9 September 2000,¹⁸ and from the PRC Ministry of Health on 19 September 2000.¹⁹

Three months later, the DPRK Red Cross did some after-action reviews during the two-day disaster preparedness and response workshop on 19–20 December 2000. The DPRK Red Cross officials involved discussed with their IFRC counterparts the best practices in expert training in disaster management assessment, selection of beneficiaries, field logistics, and distribution of relief supplies. Following the workshop, the UN Disaster Management Team established a national coordination group composed of the local representatives of resident UN agencies, the IFRC, resident international NGOs, and in-country donors.

Severe Flooding of 9–10 October 2001

At dawn on 9 October 2001, two cities and five counties in Kangwon Province, including the city of Wonsan, and three counties in South Hamgyong Province were hard hit by a tidal wave, torrential rain, and strong winds of 18–20 meters per second that lasted more than 30 hours, until noon on 10 October. The torrential rain that pounded Wonsan registered 411 mm, that is, 15 times the average precipitation in the first 10 days of October and more than had been recorded during the past 60 years of meteorological observation. The 3-meter-high sea waves swept over breakwaters and flooded Wonsan, putting it 1–1.5 meters deep under water and 30–50 cm deep in silt.²⁰

On 10 October, the county and provincial authorities cancelled the official annual celebration of the founding of the WPK. Within 20 hours, the central government dispatched the first joint disaster assessment team composed of the officials of the DPRK Red Cross and IFRC. In the initial preliminary estimate made on 11 October, they found that hundreds of industrial buildings were left submerged, which made thousands of machines hardly operational. The tidal wave and torrential rain claimed hundreds of casualties and a huge loss of properties in Wonsan alone.

On the morning of 12 October, the Red Cross officials sent their preliminary report to the newly established ad hoc Interagency Disaster Preparedness and Response Working Group (IADPRWG) in Pyongyang. The IADPRWG was made up of representatives of the FDRC, vice ministers from the Ministry of Public Health (Choe Chang-sik), Ministry of Land and Environmental Protection (Jang Yong-chol), Ministry of Agriculture, and the DPRK Red Cross Society

(Kim Sok-chol, secretary general), including an official from Kangwon Province Red Cross branch.

On 13–14 October 2001, the government authorities conducted additional assessments and identified the property, plant and equipment, raw materials, finished goods, and vehicles belonging to different industrial establishments in Wonsan—for example, the machine-building and chemical plants and the garment and furniture factories—that had been damaged, inundated, or washed away. They also found that all the goods kept in the commercial and service sectors, including wholesale houses and shops, had been either washed away or made useless by mud. Wharf facilities had been destroyed, scores of ships had either sunk or been damaged, and a lot of cargo had been washed away. Landslides and torrential rain had pulled down or submerged the houses of 30,000 families. Thousands of houses had been totally destroyed, and thousands of families suffered great property losses. Schools, kindergartens, nurseries, hospitals, and other public buildings were also left inundated and had to be closed. The sudden landslide and flood destroyed roads and bridges and completely suspended transportation and cut off the supply of electricity and post and telecommunications in the greater Wonsan area and along the eastern littoral. Agricultural-sector officials reported that sheaves of rice had been washed away from thousands of hectares of paddy fields and that the open grain storage facility in Tongchon had been destroyed.²¹

The DPRK Red Cross was the first government agency to respond by distributing relief items from the Red Cross regional warehouse to the 1,200 most severely affected families. In the following days, the Kangwon branch of the DPRK Red Cross society provided the homeless residents of Wonsan with temporary shelter, blankets and clothing, domestic items, food, and basic medical supplies as well as water and sanitation facilities.

On 18 October 2001, Kim Jong-il met with senior military and party leaders, including Jo Myong-rok, director of the general political department of the KPA; Kim Il-chol, minister of the People's Armed Forces; WPK secretaries Jon Pyong-ho, Choe Thae-bok, Kim Kuk-thae, Jong Ha-chol, Kim Ki-nam; and leading officials of the WPK CC and others ostensibly to watch a revolutionary opera, *Sea of Blood*, at the Mansudae Art Theatre on the occasion of the 30th anniversary of the Phibada Opera Troupe. But it is plausible that the real purpose of the gathering was to evaluate the situation in Kangwon and South Hamgyong Provinces, in particular in the city of Wonsan, and arrive at appropriate decisions at the highest level. Three days later, on 21 October 2001, Korean Central News Agency (KCNA) reported from Wonsan: “Deeply concerned about the disasters met by the people of Kangwon Province, Kim Jong-il took concrete

measures for the earliest possible recovery from flood damage and showed such loving care as sending gifts to the people in the flood-afflicted areas of Kangwon Province, including bedclothes and underclothes.”²² Eight days later, on 29 October 2001, KCNA reported:

Party officials, the Presidium of the Supreme People's Assembly, the Ministry of the People's Armed Forces, the commissions and ministries of the cabinet, national institutions and people from different parts of the country sent a lot of aid materials to the people in the flood-afflicted areas of Kangwon Province. The Ministry of Light Industry sent clothing materials, underwear and footwear to them. The Ministry of Power and Coal Industries, the Ministry of Metal and Machine-Building Industries, the Ministry of Construction and Building-Materials Industries and Factories and enterprises under the ministries delivered electricity, coal, cement and steels, badly needed by the areas. The Ministry of Land and Marine Transport, the Ministry of Post and Telecommunications, and the Ministry of City Management supplied a variety of materials to them, too.²³

The People's Committees of Pyongyang and Nampo were tasked with providing assistance in restoring the normal functioning of the city government of Wonsan.

The KCNA officially reported the news of this natural calamity on 15 October 2001, six days after it happened. In the meantime, the DPRK government launched a full-scale fund-raising campaign in the international community. On 16 October 2001 the DPRK Red Cross and IFRC issued a donor appeal for 815,000 Swiss francs (501,230 U.S. dollars) to obtain humanitarian assistance for 12,000 beneficiaries for three months. On 18 October 2001, the DPRK Red Cross exchanged telephone messages with its South Korean counterpart, requesting humanitarian assistance for the victims of the Wonsan flooding and calling upon the South to “show in action rather than word that its desire for the solution of the humanitarian issue is true.”²⁴

On the same day, the central committee of the DPRK Red Cross Society hosted a friendly gathering on the occasion of its 55th anniversary. At the meeting, Jang Jae-on, chairman of the central committee of the society, and Choe Chang-sik, vice minister of public health, briefed Thomas Liew, head of the visiting IFRC aid delegation, members of a delegation of the IFRC East Asia regional office, and representatives and members of the resident UN organizations and international NGOs as well as diplomatic envoys of Sweden and Germany about the ongoing humanitarian relief operation in Wonsan. The North Koreans also re-

requested their support and full-scale assistance.²⁵

For the first time the DPRK government officials indicated that they used the Sphere Project standards to determine the basic humanitarian needs of the affected population.²⁶ Also, in the wake of Kim Jong-il's successful visit to Russia in July–August 2001, the MFA and the DPRK embassy in Moscow were able to secure a Russian commitment to provide some humanitarian assistance, and on 20 October 2001 Prime Minister Hong Song-nam received a message of sympathy and condolences from the prime minister of Russia.²⁷ This was followed by Russian shipments of relief supplies for Wonsan area-residents.

The DPRK government conducted two after-action reviews—intermediate and final—related to the Wonsan humanitarian relief operation. During the second week of November 2001, the DPRK Red Cross and IFRC convened a workshop on disaster management for 30 Kangwon provincial and county officials who were directly involved in the operation; they discussed the Sphere Project standards and their application to the Wonsan situation. At the end of the disaster relief operation in late December 2001, the DPRK Red Cross and IFRC organized a second workshop for national, provincial, and country staff and volunteers, the FDRC, and North Korean government officials to reflect on the experiences gained and lessons learned in disaster response during the Wonsan relief operation.

Flash Floods of 4–5 August 2002 and Typhoon Rusa of 31 August–1 September 2002

On 4–5 August 2002, torrential rains primarily affected the western parts of the country (Kaesong, Dokchon, and Anju); the main cities in South Phyongan Province; and Nyongwon, Eunsan, Mundok, and Sukchon. Approximately 120–227 mm of rain fell in five hours, resulting in 23,000 people being left homeless and 6,681 affected but not homeless. South Hwanghae Province, the rice bowl of the country, was also hit by 340–380 mm of heavy rain in less than 10 hours. Flash floods from the mountains swept away scores of villages in North Pyongan Province, too. Similarly, floods triggered by Typhoon Rusa on 31 August and 1 September caused damage to parts of Kangwon Province. According to KCNA, the worst affected areas were the counties of Tongchon and Kosong, which received between 300 to 510 mm of rain over a 5–10 hour period on the morning of 1 September. Flooding was made worse by a tidal surge of up to 1.5 meters early on the morning of 1 September.²⁸

Joint DPRK Red Cross and Federation assessment teams went to the city of Anju on 5 August and to Kaesong, Dokchon, and South Hwanghae Province on 6 August to assess the scale of damage and the actual needs of the af-

ected people. Following typhoon Rusa on 31 August and 1 September, an interagency assessment mission to Kangwon Province took place on 2 September. The mission, which included the representatives from the IFRC, WFP, UNDP, UNICEF, the UN Office for the Coordination of Humanitarian Affairs (OCHA), and the British embassy, inspected flood damage in Tongchon and Anbyon counties. The mission did not visit the severely affected Kosong county, which was inaccessible to resident international organizations. According to these initial assessments, thousands of houses were submerged and destroyed and more than 26,000 people were left homeless in the affected four provinces—South and North Pyongan Provinces, South Hwanghae Province, and Kangwon Province, and one municipality—Kaesong city.

An early warning issued by the Red Cross and local authorities led to the organization of a timely evacuation. Hundreds of kilometers of roads and railways, a number of bridges, the communications network, and 3,700 hectares of paddy and non-paddy fields were seriously damaged in the city. The situations in Dokchon and Kaechon, which are surrounded by high mountains, were even more critical. Populated towns and villages situated between valleys were washed away by flash floods and landslides, leaving thousands of people homeless and destroying railways, main roads, and thousands of hectares of croplands. In South Hwanghae Province most of the croplands were reported to be damaged.

On a brighter side, it is noteworthy that these assessments also indicated that the two disaster preparedness workshops conducted by the IFRC in late 2001, the North Koreans' previous experiences with disaster management, and the early-warning system implemented by the local authorities and the local Red Cross branches after floods hit the same regions in October 2001 had a positive impact on the situation in terms of timely evacuation of residents from the areas at risk, thus reducing the number of injuries. No deaths were reported in this case.²⁹

The flash floods of 4–5 August apparently did not cause serious concern in Pyongyang. Kim Jong-il and the entire senior leadership reportedly followed their ordinary routine and attended the Arirang performance on 15 August. On 20–24 August, Kim went on a foreign trip to tour the Russian Far East. Neither did typhoon Rusa seem to have much impact on the political calendar. The Eighth Pyongyang Film Festival opened on 4 September, as scheduled. The Third Pyongyang Flower Show opened on 5 September. The 9 September celebrations were held nationwide as usual. A few days later, on 17 September 2002, Kim Jong-il hosted a breakthrough summit with the visiting Japanese prime minister, Junichiro Koizumi, in Pyongyang. It appears that

Kim Jong-il and senior party and military leaders made several trips to the affected areas throughout October 2002 to inspect the damages, to see the progress of the recovery and rehabilitation work, and to give on-the-spot guidance to the relief organizations and units involved, but there was no mention of Kim's direct involvement in responding to this disaster.

In the meantime, the Cabinet of Ministers activated a deputy minister level interagency working group under its secretariat to coordinate the central government's response to the sudden disaster. As usual, the government relief management agency, the FDRC, was charged with controlling and coordinating the relief activities. KPA service personnel were mobilized to provide search-and-rescue assistance and to reinforce and repair the river embankments. Provincial and local authorities mobilized human and material rescues to restore the cut telecommunications and transportation in the worst affected areas. Within days, the FDRC launched a fund-raising campaign to obtain emergency support from international aid agencies with offices in the DPRK, by arranging field visits to the worst affected areas. The central government action was mainly focused on mitigating the scale of the disaster and repairing the damaged infrastructure, including railways, main roads, and communication facilities. Because the central government concentrated on the rehabilitation of infrastructure, it was left up to the DPRK Red Cross and its international counterparts to provide emergency support to the injured and homeless population.

During the emergency phase, which lasted from August to October 2002, provincial, city, and county Red Cross branches promptly launched response activities by mobilizing their volunteers, even though their resources were limited. First aid posts were set up in the villages along with rehabilitation sites to provide medical assistance to the injured victims. The Red Cross branch in the city of Anju rapidly mobilized and deployed more than 310 volunteers for rescue, evacuation, and first aid services. Some 189 people were saved by an inflatable boat run by the Red Cross rescue team, and homeless people were temporarily evacuated to higher ground or shared houses with other families.

In Tongchon county, workers from local co-operative farms, including Red Cross-trained first responders and volunteers, collected from their villages the food items representing two weeks of food rations and distributed the food to the victims. The DPRK Red Cross and the IFRC delegation immediately released available relief stock from the regional warehouse in the city of Wonsan, Kangwon Province. They also released to the flood victims in all areas pre-positioned disaster preparedness stocks from the central disaster pre-

paredness warehouse in Pyongyang and from the regional warehouses closest to the affected areas.

The overall goal of the relief operation in the fall of 2002 was to meet the most elementary household requirements for some 26,000 women, men, and children for four months. The immediate objective was to supply non-food relief items including first aid kits, water and sanitation materials, blankets, and cooking sets by the end of September 2002. Later needs focused on continued delivery of non-food and medical supplies as well as maintaining and increasing the operational response capacity of the DPRK Red Cross Society. Following the FDRC request, the IFRC raised 947,300 Swiss francs (626,853 U.S. dollars) in the humanitarian appeal launched in mid-September 2002.

During the second phase of the relief operation, which took place in November and December 2002, the DPRK Red Cross replenished the pre-positioned disaster preparedness stocks in the central and provincial warehouses of the DPRK Red Cross Society and organized four lessons-learned workshops—one in each affected province. Throughout this humanitarian relief operation, the DPRK Red Cross Society adhered to the Code of Conduct, the Humanitarian Charter, and Minimum Standards in Disaster Response (Sphere Project) in delivering assistance to the most vulnerable, as recommended by the IFRC.

Subsequent Floods

The DPRK was again hit with floods on 24–25 July 2004,³⁰ on 4–5 August 2005,³¹ in mid-July 2006,³² and on August 7–13, 2007.³³ The government responses tended to be along the same lines as outlined above. Although fewer lives were lost because of improved national, regional, and local disaster preparedness, response, and mitigation capabilities, expertise, and experience, repeated flooding continued to cause significant infrastructure damage, major agricultural losses, and painful displacement of tens of thousands of miserable people in the affected areas.

For decades, the Hydro-Meteorological Service (HMS) of the DPRK was preoccupied with observing and reporting “wonderful natural phenomena on Mt. Paektu” and other revolutionary sites around the dates of symbolic significance like Kim Il-sung's and Kim Jong-il's birthdays and the anniversaries of the founding of the DPRK and WPK. But in the late 1990s its activities were gradually refocused on more pragmatic and worthwhile purposes. These days, the DPRK, as a member state of the World Meteorological Organization (WMO) since 1975, strives to improve its national weather forecasting and early warning systems that have been developed in close collaboration with the European Union,³⁴ the People's Republic of China,³⁵ the UNDP,

and the FAO.³⁶ The Central Hydrology Institute (under the direction of Choe Hung-sik), the Hydro-Meteorological Information Center, the Central Meteorological Institute (Director Ryu Ki-ryol, Vice Director Jong Ryong-U), and the Central Weather Forecast Institute (Director Ri Jong-U, Vice Director Ri Chol-su) under the HMS of the DPRK (Director Ko Il-hun, Vice Director Ko Sang-bok), supervised by Deputy Prime Minister Ro Du-chol, continue to improve their forecasting and analytical services in order to “prevent and mitigate natural disasters in various fields of national economy, especially agriculture, and to conduct a dynamic drive for forecasting the prospect of climatic change in the country resulting from global warming.”³⁷

Notwithstanding these efforts, the problem of repeated flooding is not going away. Recognizing that “it is the common task of humankind at present to prevent the loss of human lives and properties from natural disasters,”³⁸ the DPRK government in a way absolves itself from any responsibility by putting all the blame on global warming, the El Niño effect on the polar areas, and associated climate change in the Sea of Okhotsk and its adverse impact on the northern part of the Korean peninsula.³⁹ Specifically, the government alleges:

The changeable weather caused by global warming is seriously affecting Korea, too. In Korea, the weather gradually became whimsical from the early 1970s, seriously upsetting the balance between temperature and rainfall in the 1990s. In consequence, the DPRK was frequently hit by abnormal weather. The speed of warming in Korea at present is three times the average speed of global warming.

DPRK government scientists went on to state:

Inestimable is the damage done to different domains of the national economy by the climatic change including the reduction of grain harvest due to a long spell of torrential rain and shortage of energy caused by the lack of hydraulic power resources. The repeated natural disasters that hit the DPRK are attributable to the abnormal weather caused by global warming.⁴⁰

Flooding has always been the official North Korean reason for any hunger in the countryside. Thus, during the period of the “arduous march,” “gas-guzzling SUV-driving imperialists” half a world away were blamed for the flood-induced famine in North Korea.

In contrast, in a point well made, the South Korean press editorialized:

North Korea, despite having similar rainfall as South Korea, experiences extreme floods every year. Due to indiscriminate deforestation and land cultivation, the trees are disappearing and the drifting soil raises the water level, causing rivers to overflow easily. We cannot avoid natural disasters, but depending on the measures a nation decides to take, the damage can be lessened.”⁴¹

In some sense, flooding is a very old phenomenon in the northern half of the Korean peninsula where arable land has always been in scarce supply and yields have been notoriously low, which always put local food security in jeopardy. For centuries, floods caused periodic famines and led to peasant rebellions. That said, the fact that flooding continues to this day and that its effects are worse than they should be can be attributed to the poor governance by the current North Korean regime, especially the rather short-sighted farming practices of the Songun era such as the new policy of clearing trees for emergency fire-field agriculture, which has led to unprecedented deforestation, and the policy of farming hillsides and mountains without first terracing the soil, which has led to massive soil erosion.

As a result, large areas of arable land have become much more flood prone. As the soil slides off the mountains, it fills up streambeds and riverbeds so that when the rains come there will be floods. Also, as the trees serving as natural flood breaks are removed, there are few natural breaks to protect the countryside from mudslides and catastrophe during heavy rains. It is clear to any objective observer that repeated flooding in North Korea is not an act of God. It is a product of bad governance, economic mismanagement, poor agricultural policy, and haphazard short-term survival strategies of the starving, desperate population blinded by the *juche* ideology. Therefore, disaster preparedness and response mechanisms alone, no matter how sizable and capable they may be, will not be able to resolve this problem, which is structural in nature and can be remedied only via the fundamental overhaul of governmental policies in agriculture, land management, and public health.

SARS Scare of 2003

Spring 2003 was a time of great uncertainty and tension worldwide. As the U.S. troops pounded Baghdad, the nuclear crisis was worsening on the Korean peninsula. Kim Jong-il and senior KPA leadership were not seen in public from 12 February to 3 April 2003, missing the sixth session of the 10th Supreme People’s Assembly on 26 March 2003. An epidemic of severe acute respiratory syndrome (SARS) was raging in China. According to the WHO, 25 countries reported a cumulative total of 3,947 probable cases with 228 deaths as of 21 April 2003. The Seoul-based *Korea Times*

reported that there were patients suspected of being infected with SARS in the DPRK, a report that was vehemently denied by the North Korean government.⁴²

Presumably following Kim Jong-il's guidance, sometime in March 2003 the DPRK government formed the State Emergency Prevention Committee (also known as the National Headquarters for Emergency Prevention) on the basis of the State Emergency Infectious Disease Control Commission to coordinate the anti-SARS campaign, organized by the Ministry of Public Health (Preventive Department and Curative Department), National Hygienic Inspection Center (Director Choe Ung-jun), Korea Pugang Pharmaceutical Company (Director Jon Sung-hun), Ministry of Education, Ministry of People's Security, and other relevant agencies and organizations at the national and local levels.

The National Headquarters for Emergency Prevention reorganized all provincial and county hygiene guidance committees as local headquarters for emergency prevention; their primary job now was to conduct a nationwide campaign to improve public hygiene and infection control in hospitals.

As part of the SARS preparedness campaign, the government constructed an improved isolation facility in the only hospital (Anju People's Hospital) designated to treat potential SARS patients. The Ministry of People's Security tightened foreign travel restrictions and imposed strict quarantine at railway stations in border towns, airports, and trading posts in order to stop the entry of SARS-infected persons into the country and prevent a domestic outbreak of SARS.⁴³ Foreigners suspected of being infected with SARS were sent back to their home countries or isolated and hospitalized for treatment. North Korean officials returning from overseas tours were quarantined together with their families for medical observation for the required number of days. Korea Pugang Pharmaceutical Company was reported to have developed an anti-SARS injection, Kumdang-2.

The Ministry of Public Health, in cooperation with the Ministry of Education and state enterprises, launched an educational campaign about the cause of the disease and necessary preventive measures. Meanwhile, the domestic media gave a full account of the symptoms, infection, and danger of SARS; measures for prevention; and disease control trends around the world. The DPRK government also entered into a number of cooperative projects with the IFRC, UNICEF, WHO, WFP, Première Urgence, and OCHA in order to enhance its knowledge base and SARS prevention and control capabilities. On 21 April 2003, the State Emergency Prevention Committee declared that there was neither a single SARS case nor a suspected patient reported in the DPRK.⁴⁴

Ryongchon Train Explosion Accident of 22 April 2004

At 12:15 p.m. on 22 April 2004, just a few hours after Kim Jong-il's armored train passed through on its way from Beijing to Pyongyang, a small railroad and mining town of Ryongchon was shaken to its foundations by a huge explosion at the main railway station. Immediately rumors began to swirl that it might have been a botched assassination attempt. The official explanation released two days later said that the accident was caused by human error: "the electrical contact caused by carelessness during the shunting of wagons loaded with ammonium nitrate fertilizer and tank wagons."⁴⁵ Whatever the cause, it turned out to be one of the worst industrial accidents in the DPRK history.⁴⁶

It appears that the government initially decided to treat the site of the disaster as a crime scene. The Korean People's Security forces were deployed to seal off the township of Ryongchon and close down the accident site within hours in the evening of April 22. "A relevant organ" from the Ministry of People's Security was put in charge of conducting a preliminary investigation and damage assessment. At the same time, Korean People's Security units responding to the humanitarian emergency brought along several tons of rice, quilts, clothes, shoes, kitchen utensils, school supplies and satchels—enough to clothe and feed 400 families of four members each.⁴⁷

Because this accident was associated with Kim Jong-il's name right from the beginning, it received intense international attention and high-profile coverage in the local and foreign press. The KCNA aired an initial government report on 24 April and continued with detailed daily coverage for nearly two weeks until 5 May. The government at first simply said that the damage was "very serious." Then, on 26 April, the Ministry of People's Security released the details of its preliminary assessment:

The radius of damage is 2 km and most serious is the damage within the radius of 1.5 km. The wagon explosion made a 15 meter deep crater. More than 30 public, industrial and commercial buildings and houses for at least 8,100 families were destroyed. Houses for 1,850 families were leveled and those for 6,250 families partly destroyed. At least 150 people were killed and over 1,300 wounded.⁴⁸

The report also indicated that the government was still looking for a number of missing people who could have been either the innocent victims or culprits of this accident. Finally, on 27 April the government reported that further assessment revealed that "the damage is unexpectedly gain-

ing in scope. Horrible is human and material loss within the radius of four kilometers, including Pukjung Workers' District, as well as Ryongchon Township.⁷⁴⁹ The Ryongchon primary school, town hall, Ryongchon Coal Mine Machine Plant, and palace of culture were wiped out. Hundreds of Ryongchon residents, including children, were left blind and deaf. Total damages were estimated at 48 billion *won* or €300 million (355,170,000 U.S. dollars).⁵⁰

As the scope of the disaster became clear, on 23 April, Kim Jong-il ordered the organization of the Central Guidance Headquarters for the Reconstruction of the Afflicted Area in Ryongchon (CGHRAAR) under the secretariat of the Cabinet of Ministers. Deputy Prime Minister Ro Du-chul⁵¹ was put in charge of the Ryongchon rescue and recovery operation. The CGHRAAR was a civil-military interagency group responsible for coordinating the investigation, rescue, recovery, and rehabilitation work conducted by the “competent organs,” such as the Ministry of People’s Security, the Ministry of State Security, the KPA, and relevant government ministries and organizations including State Planning Commission, Flood Damage Rehabilitation Committee, Ministry of Construction and Building Materials Industries, Ministry of Forestry, Ministry of Post and Telecommunications, Ministry of Commerce, Ministry of Public Health, and Ministry of Education as well as the DPRK Red Cross Society. Further, the CGHRAAR decided to establish the North Pyongan provincial guidance headquarters made up of senior civilian and military officials of the province and headed by Pak Kyong-sam, chairman of North Pyongan Provincial People’s Committee, to coordinate the Ryongchon humanitarian operation at the provincial level. Choe Rin-se, vice chairman of North Pyongan Provincial People’s Committee was dispatched to Ryongchon to guide the recovery efforts on the spot. Choe Chang-sik, vice minister of public health, who was concurrently director of the DPRK Red Cross Disaster Preparedness Center, was put in charge of immediate treatment of injured people on the spot in Ryongchon. The severely wounded and burned victims were sent for treatment to Pyongan Provincial People’s Hospital, Sinuiju University of Medicine, Pyongyang People’s Hospital No. 2, and Kim Man Yu Hospital.

The government deployed more than 20,000 soldiers from VIII Corps stationed around Yeoumju, 15 kilometers south of Ryongchon, as well as thousands of civilians to assist the local population and authorities during the rescue and recovery phase. It is worthwhile to keep in mind a wise observation once made by Paul French: “The North Korean tendency to keep on throwing huge numbers of people at these problems with no equipment or medicines achieves little except good internal propaganda shots.”⁵²

The rescue and recovery phase lasted for five days until the

evening of 27 April when every resident of Ryongchon—dead, wounded, or missing—was accounted for and the necessary workforce and heavy machinery, including bulldozers, cranes, and trucks, were put in place. On 27 April, the CGHRAAR reported that “as of April 27, the craters were filled and major railways were rebuilt to resume the train service.” At the same time, the North Pyongan provincial WPK committee announced its goal “by and large, to do away with the damages and bring back normal life to the residents of Ryongchon within the next three months.” Its immediate task was to build 25 new public buildings and new two- or three-story apartment houses for 6 to 12 families each for over 800 families and to completely renovate houses for 3,600 families.⁵³ In the meantime, the CGHRAAR organized the supply of the Ryongchon operation with building materials (cement and timber), communications equipment, and handyman tools in addition to basic relief goods such as food, foodstuffs, fabrics, clothes, daily necessities, kitchen utensils, school fixtures, textbooks, and reference books.⁵⁴ This was the first time that the Cabinet of Ministers visibly took charge of the entire humanitarian relief and rehabilitation operation, supplanting the party and military organs and sidetracking the Red Cross organization.

On the international collaboration side, the MFA (Deputy Minister Kim Yong-il), the FDRC, the DPRK Red Cross Society, the National Reconciliation Council, and the Korea Asia-Pacific Peace Committee were involved in soliciting international sympathy and support and procuring international humanitarian assistance for the victims of the Ryongchon disaster. Messages of condolence and offers of relief aid arrived from Hu Jintao, Vladimir Putin, Fidel Castro, Pervez Musharraf, Norodom Sihanouk, Bashar al-Assad, Megawati Soekarnoputri, Hosni Mubarak, Abdelaziz Bouteflika, Kim Dae-jung, and others.⁵⁵

On 23 April 23, Kim Yong-nam, president of the Presidium of the Supreme People’s Assembly, and Jang Jae-on, chairman of the DPRK Red Cross Society, met in Pyongyang with Ri Yun-gu, president of the ROK Red Cross, to discuss the Ryongchon situation and possible ROK government humanitarian assistance for the victims of the disaster,⁵⁶ which arrived in the port of Nampo on 29 April (included were medicines, blankets, clothes, and foodstuff worth one million U.S. dollars).⁵⁷ The National Reconciliation Council worked with ROK NGOs and public organizations, while the Korea Asia-Pacific Peace Committee worked with the ROK businesses and corporations.

With some exceptions, the FDRC (Vice Chairman Ri Yong-sok) acted as the principal gateway for receiving and processing the humanitarian relief goods donated by foreign governments. The PRC government relief aid (crude oil,

heavy equipment, construction materials, tents, and blankets as well as foodstuffs, worth 10 million yuan or 1,209,643 U.S. dollars) crossed the Sino-DPRK border by truck and began to arrive in Ryongchon on 25 April.⁵⁸

Russian government relief aid (medicines, tents, and blankets worth 13,600,000 rubles or 470,751 U.S. dollars) arrived by air in Pyongyang on 27 April.⁵⁹ Monetary assistance provided by the General Association of Korean Residents of Japan (worth 50 million *yen*, or 459,137 U.S. dollars) was made available on 28 April.⁶⁰ Relief goods from the government of Syria (30 tons of supplies, including foodstuffs for children, medicinal drops, and medicines) arrived by air in Pyongyang on 30 April.⁶¹ Switzerland, Germany, Cambodia, which offered aid worth 20,000 U.S. dollars, and others offered monetary contributions. In addition, from 26 April to 29 April, a large quantity of medicines, clothes, foodstuffs, and building materials were delivered by trucks directly to the North Pyongan authorities from different institutions, enterprises, and individual figures in the Shenyang and Dandong areas of China,⁶² as well as the Zhongnan Regional Association of the General Association of Koreans in China (Chairman Jo Yong-hwan; Secretary General Choe Se-jin).⁶³

Despite some allegations of slow government action, lack of adequate care for the injured, and suspected incidents of corruption, misuse, and theft of relief goods,⁶⁴ the North Korean government's response to this localized industrial accident turned out to be purposeful, rather well coordinated, focused, and effective. Instead of undermining the credibility of national and local leadership and exacting a heavy toll on emergency response capabilities, it enhanced the ruling regime's legitimacy and strengthened the government's capacity to manage similar man-made disasters in the future.

In addition, less than three months after the accident, in mid-July 2004, the DPRK Supreme People's Assembly by special decree dismissed Minister of People's Security Choe Ryong-su, who had served less than a year in his position, and replaced him with a former KPA IV Corps Commander, Col.-Gen. Ju Sang-song, in order to strengthen internal security measures in the wake of the disaster.⁶⁵ The Tokyo-based news agency Radio Press reported that there was a possibility that the train explosion on 22 April at Ryongchon Station was behind the abrupt personnel change. It is possible that the internal government investigation could not rule out the possibility that the explosion may have been an attempt to assassinate Kim.

Bird Flu Outbreak of 2005

As the avian influenza was spreading across China and Southeast Asia, the DPRK experienced its first outbreak of bird flu on 25 February 2005. An official report indicated that chicken farms in Mangyongdae, Sopho, and Hadang⁶⁶ under the Pyongyang Poultry Guidance Bureau were badly affected,⁶⁷ and their workers together with KPA units had to cull, incinerate, and bury more than 219,000 chickens infected or possibly infected.⁶⁸ The ROK and Japanese media reported that North Korea may have culled as many as 10 million chickens in the Pyongyang area alone, which would be more than half of 18.73 million chickens raised in the country.⁶⁹ Whatever the cause—the migratory birds passing through the peninsula every year from February to April, or the storms of fine yellow sand coming from the Gobi Desert every March and carrying the virus,⁷⁰ or bird overcrowding and lack of hygiene and poor sanitation conditions at poultry farms—this was obviously a nationwide epizootic emergency threatening to deplete the nation's protein supply and worsen food and health security.

On 5 February 2005, KCNA reported that "Leader Kim Jong-il on several occasions in January gave detailed instructions to prevent the bird flu rapidly spreading in Asian countries."⁷¹ In accordance with these instructions, in early February 2005, the National Emergency Veterinary and Anti-Epizootic Committee (NEVAEC) chaired by Deputy Prime Minister Ro Du-chol was established under the Cabinet secretariat in order to facilitate the interagency collaboration in the event of epizootic emergency. It was composed of the senior officials from the Ministry of Agriculture (Vice Minister Kim Hyok-jin, who served concurrently as the NEVAEC vice chairman), Ministry of Public Health (Vice Minister Choe Chang-sik), Ministry of People's Security, Ministry of Land and Environmental Preservation, Ministry of Commerce, State Bureau for Quality Control, Korean Committee for Inspection and Quarantine of Exported and Imported Commodities (Chairman Kim Hyong-chol), and the Pyongyang City Poultry Guidance Bureau. To coordinate the anti-epidemic campaign at the provincial and local levels, the NEVAEC set up more than 200 provincial and county emergency epizootic prevention committees under the corresponding people's committees with the purpose of containing the spread of avian influenza.

Within the Ministry of Agriculture (Minister Ri Kyong-sik), the Central Epizootic Prevention Center headed by Vice Minister Mun Ung-jo, the Veterinary Services Bureau, and the Stockbreeding Management Bureau were mobilized to combat the bird flu outbreak. The Ministry of Agriculture sent the provinces, cities, and counties technical data on preventing the bird flu and gave technical lectures on demand to the officials of veterinary anti-epidemic stations at all

levels around the country. The Central Epizootic Prevention Center made a comprehensive assessment of the data on the outbreak and epidemiology of the bird flu worldwide and researched the latest information available from various international organizations before distributing the results of its work to different government agencies involved.⁷² Within the Ministry of Public Health, the National Hygienic Inspection Center, Preventive Department and Curative Department, and eight provincial hygienic inspection centers were involved in coping with the avian influenza emergency. The minister of health formed a permanent crisis response group composed of the officials of the National Hygienic Inspection Center and the Preventive Department and the Curative Department, as had done in the past when working to prevent the SARS epidemic in 2003.

The NEVAEC publicly admitted the bird flu outbreak in the DPRK on March 27 and officially requested international assistance from China, the ROK,⁷³ and various international organizations. The Ministry of Agriculture exchanged information and received technical assistance from the FAO and World Organization for Animal Health (OIE), whereas the Ministry of Public Health collaborated effectively with the WHO. The North Korean authorities told the FAO expert visiting Pyongyang that people in affected areas near the chicken farms had been vaccinated and that surveillance measures for the disease had been expanded to the entire country. The Veterinary Institute under the Academy of Agricultural Sciences was tasked with developing preventive measures for the future, and the Branch Academy of Cell and Gene Engineering of the State Academy of Sciences began a project to identify the virus (later on, Ho Kwang-chun, branch academy director, confirmed that the type of the virus was A [H7N7]⁷⁴) and develop a reliable vaccine. On 4 April, the veterinaries under the Ministry of Agriculture, in cooperation with the FAO and OIE experts, re-examined all chicken farms on the basis of the standard serum, antigen, and ELIZA diagnostic kits.⁷⁵ In late July, after a mandatory three-month waiting period, the NEVAEC announced that all poultry farms breeding ducks (Kwangpho, Ryokpho, KPA Farm #115), chickens (Kanggye, North Pyongan Provincial, Hwangju, Mangyongdae, Hadang, Sopho, Ryongsong, Sungho, Tokchon, Hungju), and ostriches (Taesong) had been cleared of any traces of avian influenza as of 16 July 2005.

Following the outbreak of avian influenza in spring 2005, the NEVAEC issued a number of bird flu–related policy guidelines and regulations, which sought to incorporate the lessons learned during the spring crisis and the world’s best practices concerning prevention, crisis response, mitigation, and sustainable development. First, the “General Regulations Regarding Anti-Avian Influenza Work” specified the necessary nationwide measures to prevent

future outbreaks. These include (a) close surveillance of migratory birds at 1,360 observation posts, (b) enhanced agricultural inspections at border crossings and quarantine of poultry, (c) development and use of diagnostic kits and tools, (d) annual sterilization of farms, (e) suspension of traffic around farms, (f) closure of farms to outsiders, (g) ban on open-air breeding of fowl, (h) training seminars for veterinary workers, and (i) public awareness campaigns (including databases, educational literature, posters, and stamps). It also outlined the “working system between the central organ and local organs, enabling cooperation and uniformity in the anti-epidemic work.”

Second, the “Emergency Rules of Action at the Bird Flu Outbreak” established the crisis response guidelines regarding the culling, incineration, and burial of sick poultry; closure of international borders at ports, airports, and other ports of entry; quarantine of travelers; suspension of poultry trade; identification of virus; development of vaccine and a vaccination campaign; and general reporting requirements as well as the initial emergency requirements, that is, the rules about how to deal with and control the bird flu outbreak at the initial stage. Finally, to ensure the long-term sustainability of the government’s efforts, the NEVAEC adopted the “Ten-Year Strategy for Successfully Preventing Avian Influenza.” It is based on the recommendations of the Second FAO/OIE Regional Meeting on Avian Influenza Control in Asia, held in Vietnam, and the spirit of the FAO-OIE-WHO International Meeting for Making Global Strategy for Progressive Control of HPAI, held in Thailand. It lays material foundations for the response to avian influenza, including organizational guidance, resourcing, training of technical personnel, development of rapid diagnostic kits for HPAI, ensuring the immunity and extending the validity of vaccines, and monitoring the effectiveness of vaccination.

The outbreak of avian influenza was a nationwide emergency that put considerable stress on scarce agricultural resources and health capabilities. It required a speedy crisis response, intense interagency coordination, extensive international collaboration, and a timely public awareness campaign. Although the government acted proactively, its preventive measures initially proved to be inadequate, leading to the full-blown outbreak of the bird flu in spring 2005. Initial lack of transparency and public denials undermined the confidence of the international community in the capacity of the DPRK authorities to handle the crisis on their own.⁷⁶ As the situation rapidly deteriorated, the DPRK government was compelled to admit the outbreak and open its doors to international cooperation; it invited foreign technical assistance, shared data, and adopted the necessary mitigation measures prescribed by standard international practices in coordination with the UN organizations concerned.⁷⁷

Trends in Institutional Responses to Disasters

This paper analyzed seven shocks that disrupted normal life in the DPRK during the Songun era: a localized man-made disaster in Ryongchon in 2004; three natural disasters with regional impact—typhoon Prapiroon in 2000, floods in 2001, floods and typhoon Rusa in 2002; and three calamities with a nationwide impact—flooding in 1995–96 and drought in 1997, the SARS scare in 2003, and the avian influenza outbreak in 2005.

One can identify several trends emerging in the DPRK government's response to these disasters and scares.

Increasing transparency is the first trend. It took the North Korean government several years to admit the impact of natural disasters in the mid-1990s, the country's "economic difficulties," and "the food problem" during the "arduous march," but it released the news of the devastation caused by typhoon Prapiroon on 30 August 2000, three weeks after it occurred; it reported the damage done by the flooding on 9–10 October 2001 and by typhoon Rusa on 31 August–1 September 2002, six days and three days, respectively, after the events; and the Ryongchon accident on 22 April 2004 was reported within two days. The North Korean government reported the bird flu outbreak of 25 February 2005 three weeks after the fact.

Observers agree that the timeliness, details, and amount of coverage of flood damage and rehabilitation work in August 2007 is unprecedented. According to Jean-Pierre de Margerie, the acting UN coordinator in the DPRK as well as the WFP's country representative, "the breakthrough that happened with the (August 2007) floods a few weeks ago is that the government has improved its level of transparency and cooperation by giving us unprecedented access to the field to conduct our assessments of the damage."⁷⁸

Increasing institutional knowledge and capacity for disaster management is the second trend. The Red Cross Disaster Preparedness Center, its provincial branches and disaster preparedness warehouses,⁷⁹ the national and provincial epidemic prevention centers under the Ministry of Health, the central and provincial epizootic prevention centers under the Ministry of Agriculture, the Hydro-Meteorological Information Center under the Hydro-Meteorological Service of the DPRK,⁸⁰ the Ministry of Land and Environmental Protection, the FDRC and its local branches—these are the new organizations that grew out of a decade of learning and experience in disaster management.

The personnel of these agencies accumulated significant experience and expertise in organizing, resourcing, and

executing immediate humanitarian relief, damage assessment, early recovery and rehabilitation of the beneficiary population, infrastructure, and socioeconomic activities. They also developed risk mapping and assessment tools; large databases; and academic literature about the sources, evolution, and possible impacts of and practical guidebooks on response methodologies to potential natural risks (floods, torrential rains, droughts, deforestation, wildfires, and earthquakes, for example) and health threats (avian influenza, tuberculosis, and SARS are examples) facing their country. They based their responses on relevant domestic and international lessons learned and best practices in Korea and abroad.

Of particular note is the DPRK Red Cross Society, which, with the help of the IFRC, was able to redefine and elevate its role in disaster preparedness and response, which is both acknowledged and appreciated by the government and the main international humanitarian actors in the country. The DPRK Red Cross is now considered to be the leading agency in this field, concentrating on clearly defined competencies including search and rescue, first aid, and non-food-aid assistance, all of which complement the role of government authorities during times of emergency.

Increasing interagency coordination in response to man-made and natural disasters is the third trend. In the mid-1990s, there was hardly any horizontal interbureaucratic interaction other than turf battles and mutual backbiting. As the role of the Cabinet of Ministers in the socioeconomic development of the country was progressively strengthened following the 1998 constitutional reform, the disaster management function was increasingly seen as one of the cabinet's responsibilities. Consequently, the cabinet developed the practice of establishing ad hoc interagency working groups at the deputy minister level to deal with the aftermath of each major disaster starting with the severe flooding on 9–10 October 2001. During the SARS scare in spring 2003, the government set up an interagency National Emergency Infectious Disease Control Commission. In the wake of the Ryongchon accident in April 2004, the cabinet formed Central Guidance Headquarters for the Reconstruction of Afflicted Area in Ryongchon. During the bird flu outbreak in spring 2005, National Emergency Veterinary and Anti-Epizootic Committee (later renamed into National Emergency Quarantine Committee) was set up.

These interagency working groups were usually headed by Deputy Prime Minister Ro Du-chul, who used to serve as deputy chairman of the State Planning Commission and, prior to that, as chairman of Material Supply Committee, which made him uniquely qualified for the role of chief coordinator of interagency response to disasters. The working groups tended to be composed of the same representatives

from the Ministries of Public Health, Agriculture, Land and Environmental Protection, People's Security, Red Cross Society, FDRC, and so on, which enabled mutual familiarization, cross-fertilization of ideas, greater synchronization of effort, and more programmatic collaboration.

Increasing focus on a proactive approach, prevention, and long-term sustainability of preventive programs is the fourth trend. In the second half of the 1990s, simple physical survival was the name of the game, with sporadic disaster relief for the loyal few being the norm. As the domestic situation in the country stabilized and the government's disaster management capacity grew, the newly organized disaster management institutions began to demonstrate a proactive approach and develop preventive measures. For instance, the Red Cross Disaster Preparedness Center pre-positioned warehouses with basic relief supplies in every province and set up first aid posts in every county, town, and village. The Central Epizootic Prevention Center revived the practice of annual seasonal livestock vaccination campaigns. The National Epidemic Prevention Center organized the SARS awareness campaign together with the Ministry of Education. The Hydro-Meteorological Service established the Hydro-Meteorological Information Center for weather forecasting and early warning. The new emphasis on long-term sustainability of preventive programs was highlighted in the "Ten-Year Strategy for Successfully Preventing Avian Influenza," worked out by the National Veterinary and Anti-Epizootic Emergency Commission in 2005, which would have been unthinkable a decade before.

There is very little public information on cooperation between the national security establishment, including the KPA, the Ministry of People's Security forces, Ministry of State Security, and other units, and civilian organizations in disaster management. But some public accounts have alluded to significant military assistance to the civilian authorities responsible for disaster mitigation. For instance, KPA units usually take an active part in the reconstruction of river embankments, railroads, and bridges destroyed by floods year after year (the 1995–96 period was no exception). KCNA reported that more than 20,000 soldiers and officers from the VIII Corps took part in the recovery and rehabilitation of Ryongchon. The KPA was also reported to have assisted the veterinary teams in culling, incinerating, and burying the sick chickens in the vicinity of Pyongyang during the bird flu outbreak in spring 2005. Therefore, although it is plausible to argue that the trend of close civil-military cooperation in disaster management will persist, more research on the scope and modalities of civil-military cooperation in disaster management in the Songun DPRK needs to be done in the future.

Last, without doubt, there is increasing cooperation between

the government and international humanitarian community. It started as hard-nosed negotiations on direct access to the affected areas and beneficiaries and the size and scope of international aid, often with political conditions attached. But now it ranges from joint needs assessments to joint monitoring and evaluation of implementation of humanitarian projects conducted together with international governmental organizations and international nongovernmental organizations alike. Moreover, since the late 1990s, the DPRK Red Cross Society has been increasingly adhering to the Code of Conduct, the Humanitarian Charter, and Minimum Standards in Disaster Response (Sphere Project) in delivering assistance to the most vulnerable, as recommended by the IFRC.

Explanation of Institutional Change in the DPRK: Linear vs. Complexity Thinking

In the above analysis, I attempted to avoid linear thinking—a kind of thinking that can be characterized by five commonplace assumptions—with respect to North Korea. First, I sought to demonstrate that although the static assumption that nothing is changing or is going to change in North Korea looks appealing on the surface, it actually has not been true. Second, it was tempting to make a root-cause assumption, hoping that we might be able to determine the root cause of all North Korean problems. But in my research I could not find any root causes (or even any silver bullets) in North Korea. Third, I tried to avoid slipping into the tunnel-vision assumption, focusing only on the adversary while ignoring other participants. As one can see from this paper, international actors did make a difference in what happened in the DPRK, especially through the introduction of innovative ideas and dissemination of best humanitarian practices in addition to foreign aid. Fourth, for many good reasons, scholars are attracted to the solo-actor assumption, believing that only Kim Jong-il matters. This explanation is parsimonious, and its explanatory power is significant: no institutional change has happened in Pyongyang without explicit guidance from the Dear Leader. Nonetheless, there has been some degree of autonomous institutional learning and adaptation; it is incremental in nature and caused by both positive and negative feedback from the environment regarding institutional performance in crisis situations. Hence, it is possible to question the sufficiency of and to go beyond the leadership explanation. Last, one tends to make the voluntary-participation assumption; that is, we assume that we affect the system only when we want to. But this is not the case; whether the outside world engages the DPRK or ignores it, this author believes that we affect what is going on there either way.

In contrast, my understanding of the North Korean reality is based on the paradigm of complexity thinking. There is

no definitive description or optimal state of affairs in the DPRK. I cannot say, “The North Korean problem is about . . .” because formulating the problem involves putting on blinders that eliminate vast areas of possible solution space, limit the data and information that the problem solver sees, and lead one to alienate many actors in the system. As a complex system, North Korea is sensitive to initial conditions, and, therefore, history does matter. One could argue that if it were not for the collapse of the world socialist bloc, North Korea would have been able to withstand the wrath of nature much better in the mid-1990s. In turn, the “arduous march” turned out to be one of those critical junctures that reset the bottom-line socioeconomic conditions, clearing out political space for new institutional developments culminating in the military-first policy (*songun chongchi*) aimed at building “a prosperous, powerful nation” (*kangsong taeguk*) when new people and new ideas arrive on the scene.

According to the complexity perspective, causes and effects are elusive; they tend to be nonlinear, with many delays and distances, with a high probability of disproportionality when small things may cause big effects. I assume that North Korea is a multi-minded system that constantly displays flexibility and adapts at the national level while individuals demonstrate creativity and optimize locally. It is a learning, thinking system, too. It can improve with age. It is forceful against intelligent attacks, and it exhibits counterintuitive behavior (for example, Kim Jong-il’s confessions).

North Korea is an evolved system (not a designed system). Its disaster management mechanisms are a good example of a typical crisis-driven institutional evolution. As such, this system is dynamically stable: many forces applied to a complex, dynamically stable system have no long-term effect, even if applied consistently or repetitively. It is a distributed system (locally self-reliant) with many interdependent variables and feedback loops with arguably no single point failures. North Korea may be inconsistent and unpredictable in the microcosm (short-term or locally), but it is often consistent and predictable over the long term or in the aggregate. It can undergo sudden state changes but then display robust recovery from catastrophic events, as one has been able to witness during the past two decades. The question remains open: Is there a tipping point for such a complex, dynamically stable system like North Korea’s?

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Endnotes

1. Between 30 July and 18 August 1995, torrential rains caused devastating floods in the DPRK. In one area, Pyongsan county in North Hwanghae Province, 877 mm (nearly a meter) of rain was recorded to have fallen in just seven hours, an intensity of precipitation unheard of in this area. To illustrate the flooding with just one example, water flow in the engorged Amnok River (also known as the Yalu River) that runs along the Korea-China border was estimated at 4.8 billion tons over a 72-hour period. Flooding of this magnitude had not been recorded for at least 70 years. Most severe flooding occurred in the cultivated areas around the Amnok River in North Pyongan Province, the Chong Chon River in Chagang Province, around the Unpa stream in North Hwanghae Province, and around the Namdai stream in Kangwon Province, resulting in major devastation for the agricultural sector in the DPRK. Altogether, according to data provided by the Agricultural Commission of the DPRK government, 359,936 hectares of arable lands were seriously damaged by the floods. Some of the land was irreversibly lost because of the erosion of sand, gravel, or topsoil. See “United Nations Consolidated UN Inter-agency Appeal for Flood-related Emergency Humanitarian Assistance to the Democratic People’s Republic of Korea (1 July 1996–31 March 1997)” (New York: U.N. Department of Humanitarian Affairs, April 1996), www.reliefweb.int/ocha_ol/pub/appeals/96appeals/dprk/prk_app.html.
2. Ibid. Crops of rice and maize were severely damaged in two large areas in the west of the country, particularly in North and South Pyongan and North and South Hwanghae Provinces, causing a dramatic drop in cereal production for the year. Tidal waves exacerbated the flooding in coastal areas. Combined with low food stocks and exacerbated by hail damage at harvest time in 1994, the 1995 floods caused a very serious food deficit for the 12-month period following the flooding. The flooding of the fields and heavy deposits of sand and mud destroyed crops on a considerable percentage of productive land. Destroyed crops included stocks in warehouses and households as well as maize and the standing crop of paddy that had reached the pollination stage. Heavy losses were sustained in livestock and poultry.
3. Ibid. Severe runoff erosion wreaked massive destruction, sweeping away entire villages, knocking out large bridges and dams, and in several cases permanently changing the courses of major rivers. An unexpected consequence of such large-scale runoff is often

mountainous terrain has been the deposit of huge amounts of gravel, sand, earth, and debris on previously arable land. While much of this area was uncovered using tractors and manual labor, deposits were often greater than 20 cm, which only a tractor can excavate. Although much of the work was done manually on a food-for-work basis, some deposits could not be removed without heavy machinery. Much agricultural machinery was also lost; according to the government the equipment included 668 tractors, 116 excavators, and 263 trucks. Places sustaining major damage were small and large dams, reservoirs, irrigation canals, pumping stations and irrigation equipment, roads, bridges and culverts, telephone and electricity lines and poles, and community infrastructure including schools, health clinics, and rural hospitals.

4. Ibid.

5. The FDRC was established in 1995 as the main coordination body for international humanitarian aid for North Korea. In the following years, the FDRC established local branches in all provinces; the branches have worked closely with the local branches of the DPRK Red Cross.

6. In early 1996, the UNDP initiated the Agricultural Relief and Recovery Program (AREP), one of the most important projects launched by the organization in the DPRK. This program played a key role in supporting the government in agricultural recovery and food security. The UNDP organized the first ever donor roundtable for the DPRK. Overall resources mobilized for AREP are estimated at \$343 million, of which the bulk of the assistance was donated bilaterally by the Republic of Korea, Japan, and the United States. Another \$5.4 million was channeled directly through the UNDP in cash and in-kind contributions. This program was aimed at providing agricultural inputs (fertilizers, pesticides, and seeds) and machinery to rehabilitate the land and the agricultural sector. See “UNDP in the Democratic People’s Republic of Korea (DPRK)” (New York: United Nations Development Program, n.d.), www.undp.org/dpa/journalists/DPRK.pdf.

7. “Country Reports on Human Rights Practices: Democratic People’s Republic of Korea, 2000” (Washington, D.C.: Department of State, Bureau of Democracy, Human Rights, and Labor, 23 February 2001), www.state.gov/g/drl/rls/hrrpt/2000/eap/726.htm.

8. Ri Ha-sop played an important role in introducing microbic fertilizer into the country’s agriculture and popularizing it.

9. In the course of the reorganization, the former vice chairwoman of the State Agricultural Commission, Kim Yong-suk was made responsible for international cooperation.

10. Choe Jong-gon was long engaged in Pyongyang city planning and construction projects. Serving as director of the Associated Bureau of Capital Construction under the Pyongyang Municipal Administrative Economic Committee, he became chief of staff of the Capital Construction headquarters in 1992.

11. See “N. Korea Hopes for Hugely Improved Harvest,” *Chosun Ilbo* (Seoul), 27 October 2005; see also Lee Dong-min, “North Korean Harvest Output,” *Yonhap* (Seoul), 30 November 2005.

12. “UN Food Agency to Stop Aid Work in North Korea,” Associated Press, 27 October 2005.

13. “DPRK Hard Hit by Torrential Rain, Typhoon and Landslides,” KCNA, 22 September 2000.

14. On 28–31 August 2000, WPK General Secretary Kim Jong-il visited the Kanggye Precision Machine Complex, the Kanggye Silk-Spinning Mill, a power station, a forestry station, cooperative farms, and a school in Jagang Province. He was accompanied by Yon Hyong-

muk, chief secretary of the Jagang provincial committee of the WPK; Jon Pyong-ho and Kim Kuk-thae, secretaries of the WPK CC; and its first vice department directors. See KCNA, 1 September 2000.

15. According to the KCNA report on 20 September 2000, WPK General Secretary Kim Jong-il was accompanied by Jo Myong-rok, director of the general political department of the KPA; Kim Yong-chun, chief of the KPA general staff; Ri Ul-sol, member of the National Defense Commission of the DPRK; commanders of services and arms and other KPA commanders; the secretary of the WPK CC, Jon Pyong-ho; the chief secretary of the Jagang provincial committee of the WPK, Yon Hyong-muk; the secretaries of the WPK CC, Choe Thae-bok and Kim Yong-sun; directors and first vice directors of departments of the WPK Central Committee; leading officials of the party Central Committee and chief secretaries of South and North Phyongan provincial committees and South Hwanghae provincial committee of the WPK.

16. Ibid.

17. “Agreement Adopted at Second North-South Red Cross Talks,” KCNA, 23 September 2000.

18. “Aid Equipment from UNICEF,” KCNA, 9 September 2000.

19. “Executive Plan Signed between Ministries of Public Health of DPRK and China,” KCNA, 19 September 2000.

20. “Eastern Coastal Area of DPRK Hard Hit by Tidal Wave and Torrential Rain,” KCNA, 15 October 2001.

21. Ibid.

22. “Kim Jong-il Sends Gifts to Flood Victims,” KCNA, 21 October 2001.

23. “Sincere Assistance to People in Flood-Afflicted Areas,” KCNA, 29 October 2001.

24. “Statement of Spokesman for C.C., DPRK Red Cross Society,” KCNA, 21 October 2007.

25. “Friendly Gathering Held on Anniversary of DPRK Red Cross Society,” KCNA, 19 October 2001.

26. The Sphere Project, www.sphereproject.org/. “The Sphere Project was launched in 1997 by a group of humanitarian NGOs and the Red Cross and Red Crescent movement. Sphere is based on two core beliefs: first, that all possible steps should be taken to alleviate human suffering arising out of calamity and conflict, and second, that those affected by disaster have a right to life with dignity and therefore a right to assistance.”

27. “Message of Sympathy to Premier Hong Song-nam,” KCNA, 20 October 2001.

28. “Damage Caused by Typhoon in DPRK,” KCNA, 2 September 2002.

29. “DPR Korea: Flash Floods/Typhoon,” IFRC Operations Update no. 2, 23 September 2002, www.ifrc.org/docs/appeals/02/2202r.pdf.

30. “Democratic People’s Republic of Korea: Floods,” IFRC Information Bulletin no. 02/2004, 17 August 2004, www.ifrc.org/cgi/pdf_appeals.pl?rpts04/KPfl17080402.pdf.

31. “DPRK: Floods,” IFRC Minor Emergency Update no. 1, ME no. 05ME040, 15 August 2005, www.ifrc.org/cgi/pdf_appeals.pl?05/05ME04001.pdf.

32. "DPRK Seriously Affected by Heavy Rains," KCNA, 21 July 2006.

33. "Tremendous Flood Damage in DPRK," KCNA, 25 August 2007.

34. For instance, on 10 July 2002 the government of the United Kingdom donated meteorological equipment to the Hydro-Meteorological Service of the DPRK through the World Meteorological Organization. See "UK Government Donates Equipment to HMS of DPRK," KCNA, 10 July 2002.

35. In general, the DPRK Hydro-Meteorological Service maintains close cooperation with the PRC State Meteorological Bureau, PRC State Oceanic Administration, and the PRC Ministry of Water Resources through annual interdepartmental exchanges, scientific cooperation, and technology transfer. Every other year, the DPRK Hydro-Meteorological Service signs mutually binding minutes of talks on scientific and technological exchanges and cooperation in meteorology with the PRC State Meteorological Bureau (the 10th, 11th, 12th, and 13th rounds took place, respectively, in Pyongyang, Beijing, Pyongyang, and Beijing on 17 December 1999, 12 December 2001, 17 November 2003, and 6 December 2005). See "Minutes of DPRK-China Talks Signed," KCNA, 17 December 1999; "Korea-China Cooperation in Meteorological Field," KCNA, 17 November 2003; and "Minutes of Talks Signed between DPRK and China," KCNA, 6 December 2005. The DPRK Hydro-Meteorological Service signed the minutes of talks on cooperation in oceanic science and technology with the PRC State Oceanic Administration in Pyongyang on 19 October 2004. See "Minutes of Talks on Cooperation Inked between DPRK and China," Pyongyang, KCNA, 19 October 2004. On 23 September 2004, the DPRK Hydro-Meteorological Service signed an agreement on cooperation in the hydrological work on the Rivers Amnok and Tumen with the PRC Ministry of Water Resources. See "Agreement on Cooperation in Hydrology Signed between DPRK and China," KCNA, 23 September 2004. Furthermore, various Chinese government entities periodically donate meteorological, hydrological, aerological, and oceanographic equipment to the DPRK. For instance, on 19 April 2000, 4 August 2000, 23 October 2002, 17 November 2003, and 25 January 2005 the PRC State Meteorological Bureau donated aerological sounding facilities to measure wind, humidity, atmospheric pressure, and other factors in air and weather forecasting and commanding equipment; equipment for receiving satellite telecommunications and computers; aerological observation equipment; equipment for weather news service and observation to the DPRK Hydro-Meteorological Service, according to voluntary cooperation plans of the World Meteorological Organization. See "China Donates Hydro-Meteorological Facilities," KCNA, 21 April 1999; "China Donates Equipment to DPRK Hydro-Meteorological Service," KCNA, 4 August 2000; "China Presents Meteorological Equipment to DPRK," KCNA, 23 October 2002; "Equipment Donated to DPRK," KCNA, 17 November 2003; and "Equipment Donated to DPRK by China," KCNA, 25 January 2005. On 17 April 2006, the Ministry of Water Resources of China donated equipment for communications and hydrological observation to the DPRK Hydro-Meteorological Service. See "China Donates Equipment to Korean Hydro-Meteorological Service," KCNA, 17 April 2006. On 13 April 2007, the PRC State Meteorological Bureau donated aerological observation equipment to the DPRK Hydro-Meteorological Service. See "China Donates Equipment to DPRK," KCNA, 13 April 2007.

36. North Korean media assert that "the DPRK will make sustained efforts to step up the modernization of the hydro-meteorological field in close cooperation with international bodies in a bid to prevent damage by weather, climate and water in time." See "World Meteorological Day Observed," KCNA, 23 March 2005.

37. In spring 2007, the Hydrological Institute under the Hydro-Meteorological Service of the DPRK introduced a new flood forecast and control calculating system, which is designed to forecast and help prevent flood damage. Through the system, the institute distributes its flood forecasts to the Ministry of Land and Environment Conservation, Ministry of Electric Power Industry, Ministry of Agriculture, Ministry of Land and Marine Transport, and other units as well as to the provincial hydro-meteorological observatories so that they may take necessary measures. It also maintains a database of water flow volume; water level; inflow and outflow in rivers, streams and reservoirs; and it calculates the arrival time of water at each point and the highest level when raining. With the help of the system, the institute forecasts the likelihood of flooding for major construction projects, including hydroelectric power stations and the regions that had been frequently hit by torrential rain in the past. According to Choe Hung-sik, director of the institute, this flood forecasting system can compute hourly precipitation at each observatory point nationwide; the actual states of typhoons, tsunamis, heavy rain, landslides, rivers, streams and reservoirs; and can make short- and middle-term forecasts regarding flooding. For more information, one can see "Flood Forecast and Control Calculating System Introduced," KCNA, 26 July 2007. It also provides emergency information to the areas and points that are expected to be in danger.

38. See "World Day of Meteorology Marked," *Minju Chosun* (Pyongyang), 23 March 2002.

39. For more information, see "Polar Meteorological Research in DPRK Intensified," KCNA, 23 March 2007.

40. "Global Warming and Its Consequences in Korea," KCNA, 21 August 2002.

41. Chung Sung-hee, "Man-Made Fires and Floods," *Donga Ilbo* (Seoul), 28 August 2007.

42. "False Report about Outbreak of SARS-Suspected Patients in Pyongyang Rejected," KCNA, 7 May 2003.

43. "Anti-SARS measures in DPRK," KCNA, 21 April 2003.

44. Ibid.

45. "KCNA Report on Explosion at Ryongchon Railway Station," KCNA, 24 April 2004.

46. Train crashes have been reported before. —In the 1970s a freight train carrying chemical fertilizer exploded at Hungnam Station in South Hamgyong Province, destroying buildings and houses around the station. In 1985, an estimated 500 people were killed or injured when a train crashed in Jongpyong, also in South Hamgyong Province. In 1987, a train carrying DPRK soldiers reportedly exploded in Hwasong, yet again in South Hamgyong Province. More recently, in 1997, approximately 2,000 people were reportedly killed or injured when a train crashed in Hichon, Jagang Province. In January 2000, approximately 1,000 people were killed or injured in a train accident in Yangdok, South Pyongan Province. As Paul French notes in "Ryongchon Got the Headlines but It's Floods That Remain the Major Threat," 6 May 2004, <http://pyongyangsquare.com/guest.html>: "None of these numbers are fully verifiable, although the high casualty rates would seem to indicate that the inability of the North Korean health and emergency services to respond to such disasters is a major contributing factor."

47. "Servicemen Take Lead in Assisting Accident Victims," KCNA, 29 April 2004.

48. "Damage by Explosion at Ryongchon Railway Station," KCNA, 26 April 2004.

49. "Damage Caused by Explosion on Steady Increase," KCNA, 27 April 2004.
50. Ibid.
51. Ro Du-chol was appointed deputy prime minister at the first session of the 11th Supreme People's Assembly on 3 September 2003.
52. French, "Ryongchon Got the Headlines."
53. "Every Possible Effort Made to Recover from Damage," KCNA, 27 April 2004.
54. "Nationwide Assistance to Accident Victims," KCNA, 30 April 2004.
55. "Kim Jong-il Receives Messages of Condolence from Foreign Heads of State," KCNA, 30 April 2004.
56. "Kim Yong-nam Meets Delegation of South Korean Red Cross," KCNA, 23 April 2004.
57. "First Batch of Relief Goods from South Side Here," KCNA, 29 April 2004.
58. The transportation bottleneck at the Dandong Bridge border crossing was cleared only in early May. The chief of the personnel department of international freight traffic in Dandong, Kim Jeong-dong stated, "Some drivers were bid up to 1,800 *yen* (about 270,000 *won*) for services that had originally cost 400 *yen* (about 60,000 *won*) because Chinese trucks in the cross-border area had all been mobilized for relief transportation by the Chinese government and Korean private organizations." See Yoo Seung-hwang, "North Korea to Rebuild Ryongchon," *Dong-A Ilbo* (Seoul), 30 April 2004.
59. "Emergency Relief Materials from Russia," KCNA, 28 April 2004.
60. "Koreans in Japan to Donate Relief Fund to Ryongchon Inhabitants," KCNA, 30 April 2004.
61. "Relief Goods Reach DPRK," KCNA, 1 May 2004.
62. For example, the local government of Dandong sent 700 tons of cement in 70 10-ton trucks on 29 April, and 500 tons of cement in 50 trucks on 30 April. See Yoo, "North Korea to Rebuild Ryongchon."
63. "Relief Goods Reach DPRK," KCNA, 1 May 2004.
64. "KCNA Slams Groundless Accusations over Ryongchon Accident," KCNA, 30 April 2004.
65. "N. Korea Fires Security Chief," *Yomiuri Shimbun* (Tokyo), 13 July 2004.
66. Chinese sources close to North Korea indicated that the initial outbreak occurred at the Hadang chicken plant near Pyongyang. Hadang was a newly built plant commissioned in December 2002. See Park Song-wu, "Outbreak of Bird Flu Reported in N. Korea," *Korea Times* (Seoul), 15 March 2005.
67. It is noteworthy that five chicken farms in the vicinity of Pyongyang underwent a major reconstruction and modernization in 2000–02. More than 150 new buildings were constructed, including 46 at the Mangyongdae Chicken Farm, 41 at the Ryongsong Chicken Farm, and the rest at the Sopho, Hadang, and Sungho chicken farms. Work included expanding roosts, constructing new walls, installing new insulation, flooring, and roofing; and plastering; new assembly equipment was also installed. See "Chicken Farms to Be Modernized," KCNA, 10 November 2001.
68. "N. Korea Culled 219,000 Birds at 3 Farms due to Bird Flu," *Kyodo News*, 31 March 2005.
69. "N. Korea May Have Culled 10 Million Chickens," *Donga Ilbo* (Seoul), 30 March 2005.
70. "Quarantine Measures against Bird Flu in DPRK," KCNA, 16 March 2005.
71. "Brisk Preventive Work against Bird Flu in Korea," KCNA, 5 February 2005.
72. "Strict Measures Taken to Prevent Bird Flu," KCNA, 27 November 2005.
73. In late April 2005, the North Korean government received from the ROK two quarantine vehicles and aid goods, including 20 high-pressure sterilizers, 20,000 portable diagnosis kits, and 18,000 kilograms of acid detergents worth 720 million *won* (\$710,000) as part of the ROK technical assistance donation worth 2.5 billion ROK *won* aimed at helping the North contain the avian influenza. Three ROK Red Cross officials and one technician went to the port of Nampo by ship to explain to their DPRK counterparts how to use the equipment. See "Seoul to Give Anti-Bird Flu Kits to North Korea," *Korea Times* (Seoul), April 20, 2005.
74. "Basis to Identify Bird Flu Viruses Established in DPRK," KCNA, 21 December 2005.
75. "Preventive Work against Bird Flu," KCNA, 8 April 2005.
76. The government's reputation for increasing transparency suffered another blow in November–December 2005, when the Japanese media, citing an anti-Pyongyang representative of the North Korean human rights organization in Japan, alleged that there had been another bird flu outbreak in North Korea, this one with a suspected bird-to-human transmission. The DPRK government denied these allegations but later announced that it was building a special ward for potential bird flu patients at one of the people's hospitals in North Pyongan Province.
77. Later, in his 2006 annual report, the UN Development Group resident coordinator stated:
<EXT>Despite several avian flu outbreaks in the Republic of Korea during 2006, no cases were confirmed by authorities in DPRK since the initial 2005 outbreak. In 2006, the Government stepped up its avian flu contingency planning and preparedness efforts. Technical assistance and logistic support were largely provided through WHO and FAO. Emphasis was given to planning, laboratory diagnostic capacity, hospital infection control, surveillance and rapid response. Veterinary and anti-epidemic laboratory diagnosis capacity was considerably strengthened at the central level, as was the national surveillance network in all provinces, including the veterinary vaccine production center's facilities in North Pyongan province. The UNCT and the DPRK Government met in May 2006 to review the Government's AHI contingency plan and to discuss possible areas of support by the UN. A Multi-sectoral National Avian Influenza Emergency Measures Coordination Committee was established under the Prime Minister. The UNCT has established communication channels with national counterparts for AHI preparedness and response. The UNCT revised its own AHI contingency plan in October 2006 in response to comments received from the office of the UN System Influenza Coordinator.
For further details, see "RCAR 2006: DPR Korea," United Nations Development Group, www.undg.org/rcar.cfm?fuseaction=N&ctyID

C=DRK&P=490.

78. "North Korea Unusually Open about Flood Damage, UN Says," Reuters, 3 September 2007.

79. The DPRK Red Cross has its headquarters in Pyongyang and provincial and city and county branches in the affected areas. Red Cross branches are running first aid posts and have good human resources, including more than 15,000 Red Cross youth volunteers in the affected areas. The National Society has one central disaster preparedness warehouse and five regional warehouses in different parts of the country that keep relief items for 12,000 families, out of which almost 5,000 family package can usually be distributed immediately.

80. "Hydro-Meteorological Information Service in DPRK," KCNA, 12 July 2006.



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