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Trans-boundary water resource management cooperation between the two Koreas: challenges and opportunities by Sukjoon Yoon

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Trans-boundary water resource management plays an important role in security cooperation and also impacts border trade and human exchanges. Lack of trust can give rise to political and economic challenges, even to military tensions and conflict, resulting in the neglect of coordinated water resource management. Conversely, improvement of such coordination can help alleviate many problems. On the Korean Peninsula, water is a scarce resource. Establishing an effective system for water management offers a path toward mitigating tensions and building trust between the two Koreas. Such a project is technically feasible and would facilitate economic development in the trans-boundary area.

North Korea has borders, delineated by rivers, with three Chinese provinces and the Far Eastern Federal District of Russia. Despite intractable geopolitical and military tensions in this region, the surface waters on and to the north of the Korean Peninsula are an important medium through which such tensions can be addressed, hopefully leading to better relations among the two Koreas, China, and Russia. The Yalu (Amnok) River, which flows into the Yellow Sea, forms the border with the northeastern Chinese provinces, and the Tumen (Duman) River, which flows into the East Sea (the Sea of Japan), forms the border with Russia. Both rivers are natural barriers to migration, though economic failures and the political situation in North Korea have produced a tide of refugees willing to take their chances.

The Korean Peninsula is mired in the legacy of the Cold War. In lieu of a peace settlement, an armistice remains in place between the two Koreas, the maintenance of which is a military operation. The de facto military demarcation between the two Koreas is the demilitarized zone (DMZ) established by the 1953 Armistice Agreement. This has effectively prevented all direct interaction between North and South Korea, but the Imjin River that flows between them could provide an opportunity for better relations.

During the last two decades, rainfall on the Korean Peninsula has declined. There is growing demand for fresh water of high purity with the appropriate mineral content for both agricultural and industrial development. This, the apparent impact of anthropogenic climate change, and the possibility of natural disasters, notably the occasional earthquakes that occur on the Korean Peninsula, should also be taken into account. The two Koreas have recently been heavily afflicted by floods and droughts, and climatic unpredictability has reduced the usable water supply: it is time to consider establishing a system of more effective trans-boundary water resource management. It would be prudent to secure a fresh water supply through reservoirs and multiple dams in appropriate North Korean locations, to maintain the necessary flow rate across the border to major South Korean cities, most notably to the Seoul urban area where more than 20 million people live. Such measures are a sensible and necessary defense against further climate change, which will likely cause more frequent floods and droughts, and a seasonal reduction in the usable water supply.

Because of its mountainous terrain and the limited precipitation between December and May, Korea depends on runoff for many months of each year. Water resource utilization rates for South Korea are less than 25 percent, and hydropower exploitation also offers considerable scope for improvement. Since water flows naturally from north to south across the DMZ with about 730 million cubic meters of good quality water being available each year, there is a clear incentive for cooperation between the two Koreas. Coordinating water management strategies in the border region will provide significant economic and social benefits to both countries. In practice, there are two aspects to this project: water flow cooperation and water resource management.

Cooperation on water flow is already being implemented. This follows the incident in September 2009, when a vast amount of water was released without warning from Hwanggang Dam in North Korea, presumably accidentally, causing the deaths of six South Korean residents near Imjin River. In October 2009, the two Koreas established an operational agreement to share information about water resources and to provide proper notice of planned water releases. This de facto cooperation mechanism on water flow near the DMZ facilitates the exchange of hydrological information when floods commonly occur. Prior notice of water released into the Imjin has been provided by the North for more than 10 years via hotlines established to link North Korea with the South Korean K-Water agency. Consultations about trans-boundary water resources to provide flood planning control and to discuss disaster relief contingencies have been held on a friendly basis, providing substantial benefits to both countries.

Cooperation on trans-boundary water resources near the DMZ has been getting more attention as climate change threatens to harm local economic activities and social development near the Imjin River. With water resources becoming scarcer, such cooperation is the most significant forum for non-military security cooperation and economic interaction. Water pollution is a serious problem near large towns and urban areas where raw or partially treated sewage and toxic chemicals sometimes contaminate both running

water and reservoirs. Thus, water resource management cooperation between the two Koreas represents a model for best practice in good cross-border relations, with ground-water managed through a civil cooperative mechanism, to avoid over extraction.

Through smart water policies and appropriate interventions, the two Koreas can ensure a climate-resilient, water-secure future. Comprehensive implementation of effective water security cooperation between the two Koreas will, however, require improved planning for water-resource allocation, the adoption of incentives to increase efficiency, joint infrastructural investment, and better urban planning, water-risk management, and citizen engagement.

Despite rising political and military tensions, the two Koreas were still able in October 2009 to reach an agreement obliging both to share information pertaining to water security to ensure effective cooperation on water resource management. The agreement allowed both sides to effectively manage flood control, limiting any resulting damage. This was seen as a model for non-military cross-border cooperation between the two Koreas. But frictions continued to rise, and North Korea suspended the 2009 agreement on water resource management so that hydrological information is no longer being communicated. The last time that the North informed the South of a planned release was in July 2013, and the relevant hotline was severed after the closure of the Kaesong industrial complex. Thus, water security cooperation on the Imjin River has been sacrificed for political purposes.

North Korea recently made two unilateral releases of water from Hwanggang Dam, on May 16 and July 6, 2016, ignoring its obligations to provide prior notice, and threatening South Koreans living downstream near the Imjin. Such behavior, even if not maliciously intended, could lead to the kind of fatal incidents that occurred in 2009, but it is also possible that the North Korean regime might use water for an attack.

Hwanggang Dam is 42 km (26 miles) north of the DMZ, from where the Imjin River flows to the Gunnam Dam in South Korea. Its capacity is thought to be between 300-400 million tons; Gunnam Dam can only hold about 70 million tons. This discrepancy gives North Korea a weapon to inflict serious economic damage upon South Korean districts downstream, principally Yeoncheon and Paju counties of Gyeonggi Province, by seriously disrupting agricultural and fish farming enterprises. This scenario may seem hypothetical, but the South Korean government cannot neglect this possibility: the use of flood waters as a weapon cannot be ruled out, and all precautions should be taken. There is military involvement in monitoring water resources on both sides of the DMZ, and it has been reported that the South Korean military is deploying drones to assess the water level of the Hwanggang Dam to predict when water might be released by North Korea.

The current situation of water resource management between the two Koreas is characterized by frequent misinterpretation and misunderstandings. The increasing unpredictability of scarce water resources could be a risk multiplier, exacerbating tensions on the Korean Peninsula. Nonetheless, it should be possible to establish a system of water resource management in which water flows are agreed cooperatively, forming a model for trans-boundary cooperation between the two Koreas, although territorial integration remains unresolved.

Three factors are necessary to sidestep the difficulties resulting from such tensions. First, both sides should recognize that unilateral policies for this scarce water resource will lead to instability and potential conflict between them: they have to work together. Second, as climate change increases the severity and frequency of extreme weather events, both sides should make every effort to avoid misunderstandings, through a civil system of water security cooperation. If water resources are allowed to become a military rather than a civil matter, then both sides will suffer from reduced economic growth, political instability, and the threat of serious military escalation near the DMZ. Third, the two regimes of the Korean Peninsula should develop a variety of trust-building measures. With prudent and pragmatic cooperation, the two Koreas should be able to cope with their natural water resources and with the uncertainties affecting water security, ensuring that their people and economies are prepared for the future.

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