

North Korea Coastal Artillery Threat

Vulnerability Analysis and Shelter Status in South Korea

Background

South Korea (SK) and North Korea (NK) have been under an armistice after the Korean War, and there have been many provocations on the Korean Peninsula for about 70 years. Especially, there have been many engagements between SK and NK military in the Yellow sea because there is no buffer zone like DMZ, which is a border barrier on the Korean Peninsula. On November 23, 2010, NK coastal artillery hit SK Yeonpyeong island, and 44 islanders and marines were wounded in the attack, which destroyed 25 homes and damaged 78 more. SK was attacked because NK coastal artilleries were hidden in tunnels and frequent NK coastal artillery drills made it difficult to distinguish NK had conducted drills or actual attack. The danger of NK coastal artillery still exists in SK and protecting civilians from the NK threat is the most significant mission of SK authorities and military.

This project focuses on identifying whether the area in SK that are vulnerable to NK coastal artillery attack. Understanding which part of SK are most vulnerable to NK coastal artillery attack will allow SK authorities and military to prepare for NK threats.

NK Coastal Artillery

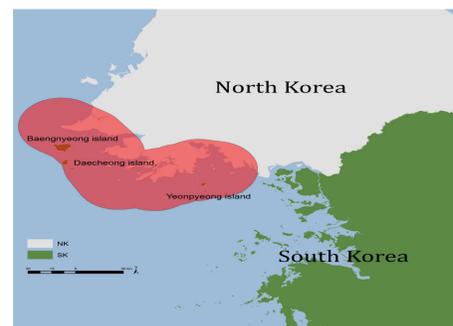
As a result of analyzing the Yeonpyeong island provocation, NK used 76.2 mm direct fire guns and 130 mm towed field guns as the coastal artillery. The maximum range of 76.2mm is 12 km and the maximum range of 130mm is 27km. SK areas, located within 27km of the NK coastal artillery, are most at-risk and vulnerable. Further, NK coastal artilleries are located along the coastline on the west coast.



NK Coastal Artillery Positions



130 mm



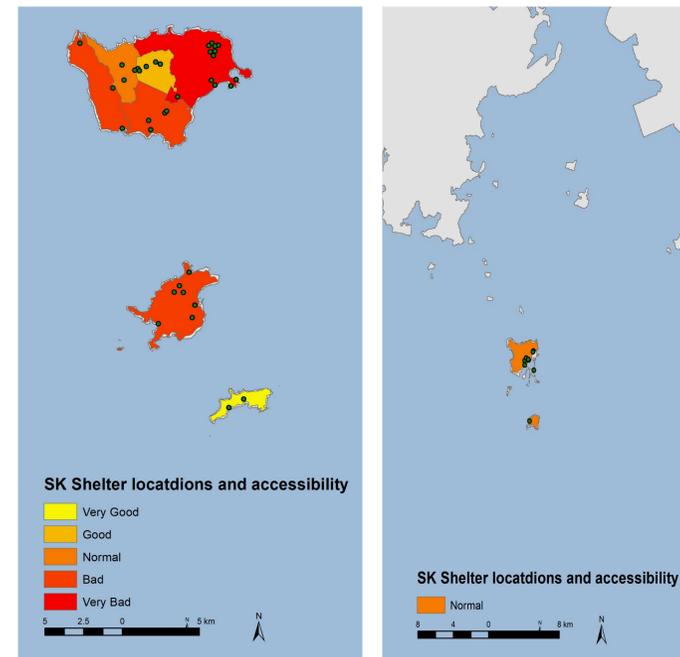
Baengnyeong island, Daecheong island, and Yeonpyeong island are located in the NK coastal artillery range,

Methodology

Vulnerability Analysis: This process was divided into two steps. The first part of the analysis looked at SK area where NK coastal artillery attack is possible. The area was calculated from the 27km buffer set from NK coastal artillery. Next part of the analysis looked at Census data for the social vulnerability factors: Total population, under 18, over 65, and foreigner. After calculation of the social vulnerability factors, the point scores of the four factors were combined.

Shelter Accessibility: This process involved in shelters locations and distances. After entering the location of the shelter, the accessibility and capacity of the shelter were compared.

SK Shelters



Limitation

The exact location of NK Coast Artillery is SK military secret and could not be used in this project. Using the exact location of the NK coastal artillery, we can identify the exact SK vulnerability area and increase the reliability of the project.

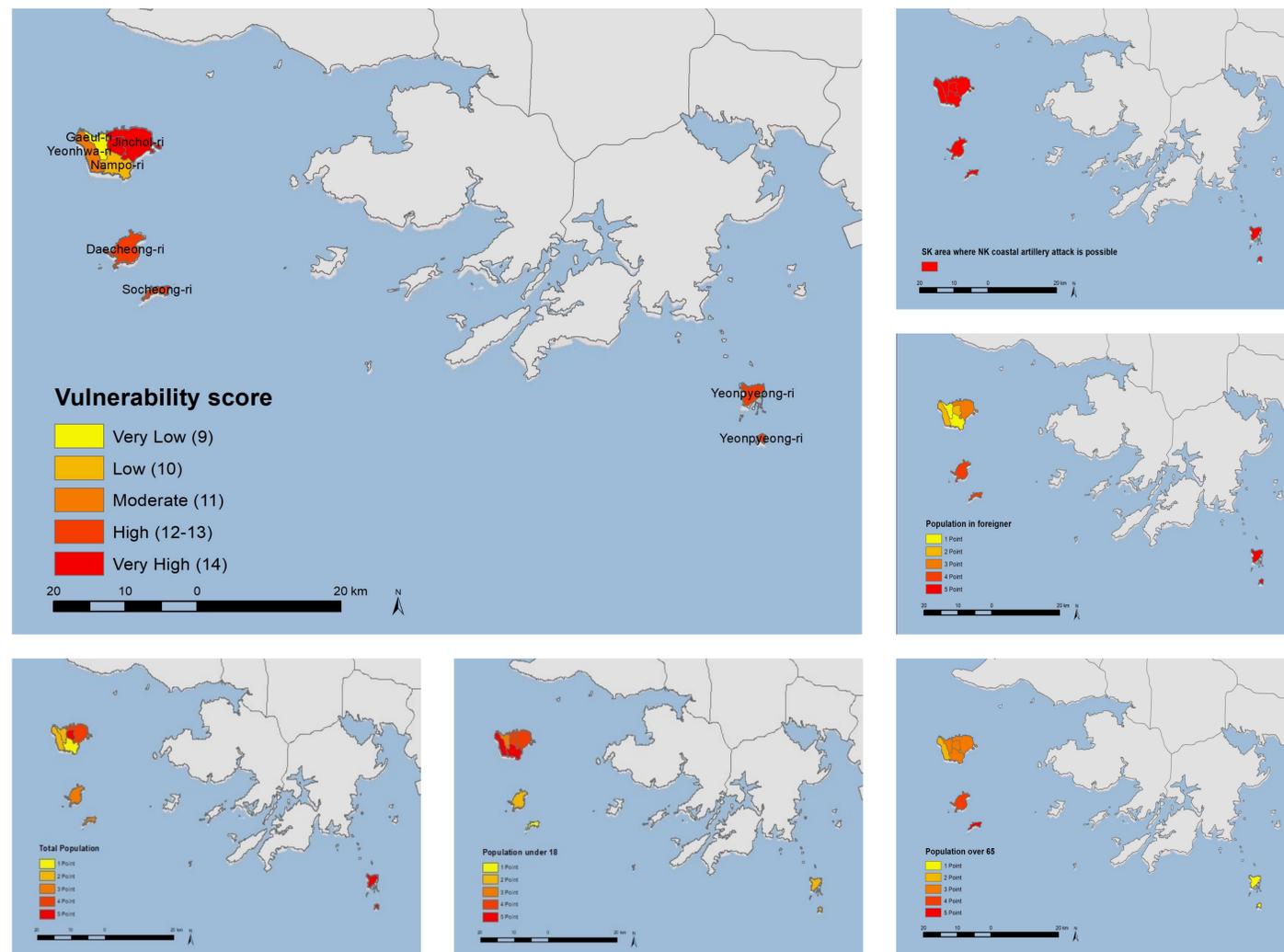
Data Sources

Sources: Data.go.kr, Korean Statistical Information Service, Global Administrative Areas (GADM), Statistical Geographic Information Service, Google images

Conclusion

SK Area	Township	Populations	Shelter number	Shelter Capacity
Baengnyeong Island	Jinchol-ri	2,552	12	2,884
	Bukpo-ri	1,574	5	1,063
	Gaeul-ri	353	3	438
	Yeonhwa-ri	471	3	491
	Nampo-ri	420	4	608
	Sub-total	5,370	27	5,484
Daecheong Island	Daecheong-ri	1,290	7	1,310
	Socheong-ri	236	2	349
	Sub-total	1,526	9	1,659
Yeonpyeong Island	Yeonpyeong-ri	2,141	10	2,872

Most At-Risk and Vulnerable Area in SK



Jinchol-ri and Bukpo-ri are the most at-risk and vulnerable area. Daecheong-ri, Socheong-ri, and Yeonpyeong-ri are next most vulnerable area. In the following order, vulnerability are lowered: Yeonhwa-ri, Nampo-ri, Gaeul-ri.

Jinchol-ri has 12 shelters but shelter accessibility is bad. Bukpo-ri has a low shelter number but shelter accessibility is good because there are many shelters around. As a result, Jinchol-ri's shelters need reinforcement.

Future analyses can consider additional variables. Current shelters in vulnerable area are sufficient for residents. However, Baengnyeong, Daecheong, and Yeonpyeong islands are famous for tourists. By analyzing the area of the shelter where the number of sightseeing places and the number of visitors, it is possible to calculate the area where the shelter is needed.