

NORTH KOREA



Source: esri

General

North Korea - officially the Democratic People's Republic of Korea (DPRK) - is a sovereign state in East Asia constituting the northern part of the Korean Peninsula. In the North and Northwest, the country is bordered by China and by Russia along the Amnok and Tumen rivers. It is bordered in the South by South Korea. The area is 12.1 Mha (million hectares) with, in 2022, a population of 26 million, or 2.1 persons per ha (Wikipedia and United Nations, 2022).

Climate and geography

North Korea experiences a combination of continental climate and an oceanic climate, but most of the country experiences a humid continental climate. Winters bring clear weather interspersed with snowstorms as a result of northern and north-western winds that blow from Siberia. Summer tends to be by far the hottest, most humid, and rainiest time of year because of the southern and south-eastern monsoon winds that carry moist air from the Pacific Ocean. Approximately 60% of all precipitation occurs from June to September. Spring and autumn are transitional seasons between summer and winter. The daily average high and low temperatures for Pyongyang are -3 and -13 °C in January and 29 and 20 °C in August (source: Wikipedia).

Some 80% of the country is composed of mountains and uplands, separated by deep and narrow valleys. All of the Korean Peninsula's mountains with elevations of 2,000 m or more are located in North Korea. The coastal plains are wide in the West and discontinuous in the East. A great majority of the population lives in the plains and lowlands. Forest covers over 70% of the country, mostly on steep slopes. The longest river is the Amnok (Yalu) River which flows for 790 km (source: Wikipedia).

Existing polders

The following polders have been identified:

- *Taedong Bay (6,200 ha)*. This area was reclaimed from 1987 – 1993 (sources: Wikipedia and Google Earth);
- *Kumsong (3,207 ha)*. This polder is most probably located inland in a former depression (sources: Wikipedia and Google Earth);
- *Taegye Do (8,800 ha)*. Originally the sea dike was closed in 1984. The total endiked area was 8,800 ha, of which 7,300 ha would be agricultural land and 1,500 ha water and fish ponds. In the sea dike there are two discharge sluices. While in 1994 the inner dikes were not yet constructed, only 3,500 ha, located at the higher areas, were cultivated. The original lay out is shown in the report by the United Nations Development Programme (UNDP) and Food and Agriculture Organization of the United Nations (FAO) (1994) (Figure 1).



Figure 1. Original lay out of the Taegye Do Polder (UNDP and FAO, 1994)

- *Unryul Polder (3,500 ha)*. In 1994 the sea dike for this polder was closed at and some 3,500 ha would be reclaimed in the near future (UNDP and FAO, 1994). At Google Earth it can be observed that only a limited part has been reclaimed;
- *Kang Ryong Project (5,200 ha)*. In 1994 this area was endiked of which 4,200 ha would remain fresh water to be used for irrigation;
- *Ryong Mae Do project (4,000 ha)*. In 1994 the sea dike was closed and reclamation had started;
- *18th September project (3,500 ha)*. In 1994 the sea dike was closed and reclamation had started.

General characteristics of the polders in North Korea are shown in Table I.

Proposed polders

In the report by UNDP and FAO (1994) it is described that the DPRK has started with the reclamation of tidal land along its western coast. The reclamation would cover 300,000 ha tidal land and was accepted at the 6th Congress of the Workers Party in 1980 (Figure 2).



Figure 2. Proposed tidal land reclamation in the DPRK with a total area of 300,000 ha (UNDP and FAO, 1994)

Ka Do (33,500 ha). For the Ka Do project the construction of the sea dike, with a total length of 16.2 km had started in 1994. A total area of 33,500 ha, would be endiked of which 27,800 ha agricultural land and 5,700 ha water, roads and fish ponds. Three discharge sluices would be constructed in the dike. The by that time projected dike sections in the Ka Do area are shown in Figure 3. However, at Google Earth it can be observed that only a small upstream part of the area has been endiked.

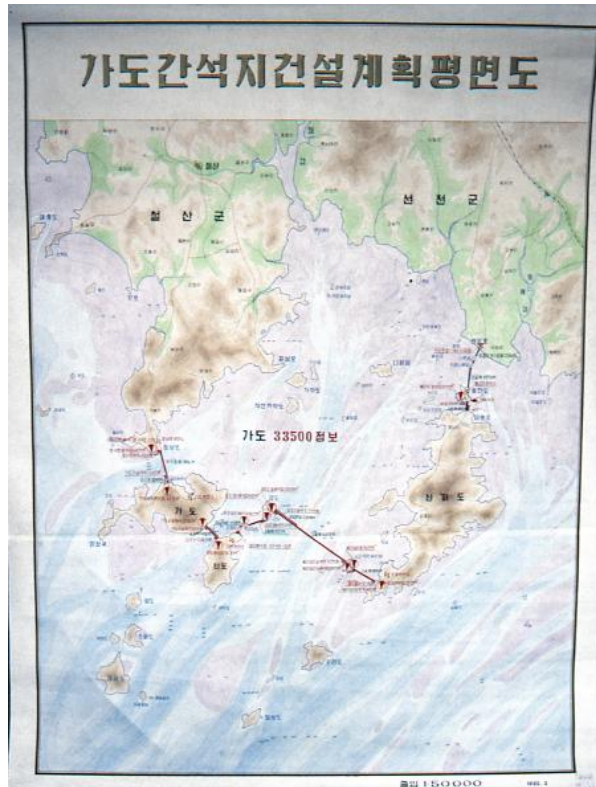


Figure 3. Proposed Ka Do tidal land reclamation project

Location of the polders in North Korea as shown on the World polder map

The location of the polders in North Korea is shown in Figure 4.

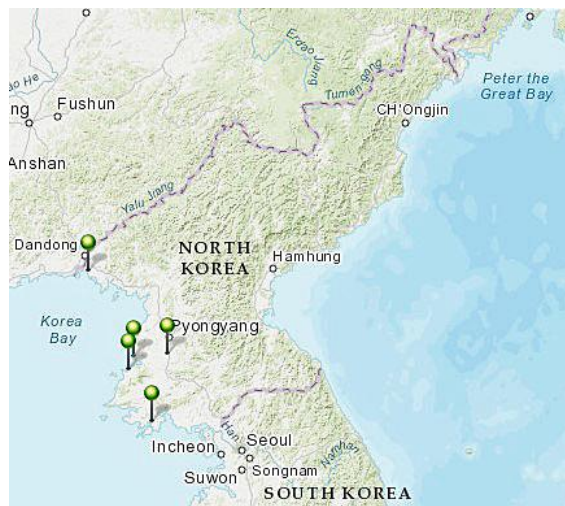


Figure 4. Location of the polders in North Korea (source: esri – Batavialand)

The pictures by Prof. Bart Schultz are shown in Table II.

References

- Group Polder Development, Department of Civil Engineering, Delft University of Technology, 1982. *Polders of the World. Compendium of polder projects*. Delft, the Netherlands
- Rijksdienst voor de IJsselmeerpolders en Rijkswaterstaat, 1987. *Technical assistance in tidal land reclamation. Report of the mission to the Democratic People's Republic of Korea*. October 5 - 22. Lelystad, the Netherlands.

United Nations Development Programme (UNDP) and Food and Agriculture Organization of the United Nations (FAO), 1994. *Technical Assistance in Tidal Land reclamation Democratic People's Republic of Korea. Project findings and recommendations*. Terminal Report. Rome, Italy.

United Nations, Department of Economic and Social Affairs, Population Division. 2022. *World Population Prospects, medium prognosis. The 2022 revision*. New York, USA.

Bart Schultz









Lelystad, October 2023

Table I. General characteristics of existing polders in the Democratic Peoples Republic of Korea

Name	Reclamation	Area in ha	Type *)	Latitudes	Longitudes	Elevation in m+MSL	Land use
<i>Existing polders</i>							
Taedong Bay	1987 - 1993	6,200	LGS	39° 05' N	125° 33' E	10	Agriculture
Kumsong Polder	1994	3,207	RLL	38° 46' N	125° 44' E	15	Agriculture
Taegye Do Polder	1984 and 2010	7,300	LGS	39° 48' N	124° 31' E	0	Agriculture
Unryul Polder		3,500	LGS	38° 35' N	125° 05' E	0	Agriculture
Kang Ryong Project		1,000	LGS	37° 53' N	125° 30' E	3	Agriculture
Ryong Mae Do Project		4,000	LGS	38° 8' N	124° 54' E	15	Agriculture
18th September Project		3,500	LGS	37° 53' N	125° 30' E		Agriculture
Total		29,207					
<i>Proposed polder</i>							
Ka Do		33,500	LGS				
Total		33,500					

*) RLL = reclaimed low-lying land; LGS = land gained on the sea; DL = drained lake

Table II. Pictures of polders and lowlands in North Korea by Prof. Bart Schultz

			
<p>D4 7 001/VII-1 *) Group picture taken in Pyongyang, North Korea. Middle Ir. Jan Middelburg, Dienst der Zuiderzeewerken, right Ing. Jan van Westen, Deltadienst, second on the right, Mr. Li Lyon Lyob, guide, Mrs. Chon Son Ae, interpreter. Other three not known. 5-22 October 1987</p>	<p>D4 7 002/VII-2 View over the polder Taegye Do. 5-22 October 1987</p>	<p>D4 7 003/VII-3 View over the polder Taegye Do. 5-22 October 1987</p>	<p>D4 7 004/VII-4 Access road in the polder Taegye Do. 5-22 October 1987</p>
			
<p>D4 7 005/VII-5 Sea side of the sea dike under construction of the polder Taegye Do. In front Ing. Jan van Westen, in the back Mr. Evan Melder, Deputy Resident Representative UNDP. In the middle North Korean dike specialist. 5-22 October 1987</p>	<p>D4 7 006/VII-6 Sea side of the sea dike under construction of the polder Taegye Do. 5-22 October 1987</p>	<p>D4 7 007/VII-7 Sea side of the sea dike under construction of the polder Taegye Do. 5-22 October 1987</p>	<p>D4 7 008/VII-8 Outer slope of the sea dike under construction of the polder Taegye Do. 5-22 October 1987</p>

*) Batavialand/original

Table II. Pictures of polders and lowlands in North Korea by Prof. Bart Schultz (continued)









			
<p>D4 7 009/VII-9 Outer slope with a small wall of the sea dike under construction of the polder Taegye Do. 5-22 October 1987</p>	<p>D4 7 010/VII-10 First section for the sea dike of the polder Ka Do. Because of this such a large erosion of the adjacent section occurred that the project was stopped. 5-22 October 1987</p>	<p>D4 7 011/VII-11 Group picture in front of the first section for the sea dike of the polder Ka Do. Second from the left Ing. Jan van Westen, middle Ir. Jan Middelburg, on the right side of him Mr. Li Lyon Lyob, guide. The other people are unknown. 5-22 October 1987</p>	<p>D4 7 012/VII-12 First section for the sea dike of the polder Ka Do. Because of this such a large erosion of the adjacent section occurred that the project was stopped. 5-22 October 1987</p>
			
<p>D4 7 013/VII-13 Construction of the sea dike for Unryul Polder with mine rubbish. 5-22 October 1987</p>	<p>D4 7 014/VII-14 Construction of the sea dike for Unryul Polder with mine rubbish. 5-22 October 1987</p>	<p>D4 7 015/VII-15 Sea dike with discharge sluice, probably of Unryul Polder. 5-22 October 1987</p>	<p>D4 7 016/VII-16 Sea dike with discharge sluice, probably of Unryul Polder. 5-22 October 1987</p>

Table II. Pictures of polders and lowlands in North Korea by Prof. Bart Schultz (continued)













			
D4 7 017/VII-17 Sea dike, probably of Unryul Polder. 5-22 October 1987	D4 7 018/VII-18 Sea dike, probably of Unryul Polder. 5-22 October 1987	D4 7 019/VII-19 Polder landscape, probably of Unryul Polder. 5-22 October 1987	D4 7 020/VII-20 Polder landscape, probably of Unryul Polder. 5-22 October 1987
			
D4 7 021/VII-21 Nampo Barrage. 5-22 October 1987	D4 7 022/VII-22 Soldiers pose at the monument near the Nampo Barrage. 5-22 October 1987	D4 7 023/VII-23 Nampo Barrage with discharge sluices and shiplocks. 5-22 October 1987	D4 7 024/VII-24 Nampo Barrage with discharge sluices and shiplocks. 5-22 October 1987
			
D4 7 025/VII-25 Nampo Barrage. 5-22 October 1987	D4 7 026/VII-26 Map with land reclamation plans of North Korea. 5-22 October 1987	D4 7 027/VII-27 Map with sea dike alignments of the proposed coastal reclamation Ka Do. 5-22 October 1987	D4 7 028/VII-28 Map with dike alignments and parcellation of the proposed reclamation Taegye Do. 5-22 October 1987

Table II. Pictures of polders and lowlands in North Korea by Prof. Bart Schultz (continued)









			
<p>D4 7 029/VII-29 Principle of the parcellation of the proposed reclamation Taegye Do. 5-22 October 1987</p>	<p>D4 7 030/VII-30 Map with land reclamation plans of North Korea. 5-22 October 1987</p>	<p>D4 7 031/VII-31 Map with sea dike alignments of the proposed coastal reclamation Ka Do. 5-22 October 1987</p>	<p>D4 8 033/VIII-33 First section for the sea dike of the polder Ka Do. Because of this such a large erosion of the adjacent section occurred that the project was stopped. 2-24 May 1989</p>
			
<p>D4 8 034/VIII-34 First section for the sea dike of the polder Ka Do. Because of this such a large erosion of the adjacent section occurred that the project was stopped. 2-24 May 1989</p>	<p>D4 8 035/VIII-35 First section for the sea dike of the polder Ka Do. Because of this such a large erosion of the adjacent section occurred that the project was stopped. 2-24 May 1989</p>	<p>D4 8 036/VIII-36 Working port with ships for the construction of the sea dike for the proposed reclamation in the Ka Do area. 2-24 May 1989</p>	<p>D4 8 037/VIII-37 Excavation for the construction of the sea dike for the proposed reclamation in the Ka Do area. 2-24 May 1989</p>

Table III. Pictures of polders and lowlands in North Korea by Prof. Bart Schultz (continued)











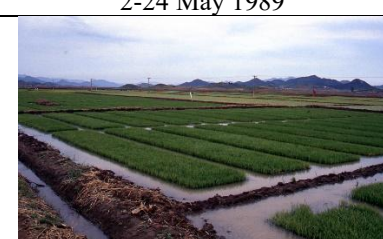
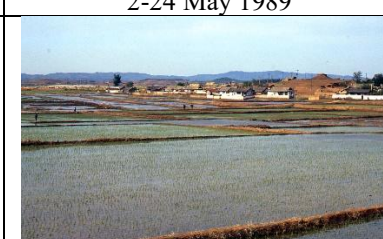





			
D4 8 038/VIII-38 Transplanting of rice in a levelled area in North Korea. 2-24 May 1989	D4 8 039/VIII-39 Transplanting of rice in a levelled area in North Korea. 2-24 May 1989	D4 8 040/VIII-40 Transplanting of rice in a levelled area in North Korea. 2-24 May 1989	D4 8 041/VIII-41 Transplanting of rice in a levelled area in North Korea. 2-24 May 1989
			
D4 8 042/VIII-42 Transplanting of rice in a levelled area in North Korea. 2-24 May 1989	D4 8 043/VIII-43 Transplanting of rice in a levelled area in North Korea. 2-24 May 1989	D4 8 044/VIII-44 Transplanting of rice in a levelled area in North Korea. 2-24 May 1989	D4 8 045/VIII-45 Transplanting of rice in a levelled area in North Korea. 2-24 May 1989
			
D4 8 046/VIII-46 Nursery of rice in levelled fields in North Korea. 2-24 May 1989	D4 8 047/VIII-47 Nursery of rice in levelled fields in North Korea. 2-24 May 1989	D4 8 048/VIII-48 Nursery of rice in levelled fields in North Korea. 2-24 May 1989	D4 8 049/VIII-49 Landscape with rice fields in North Korea. 2-24 May 1989

Table III. Pictures of polders and lowlands in North Korea by Prof. Bart Schultz (continued)

			
<p>D4 8 050/VIII-50 Landscape with rice fields in North Korea. 2-24 May 1989</p>	<p>D5 9 001/IX-1 View at polder Taegye Do in North Korea. 2-24 May 1989</p>	<p>D5 9 002/IX-2 View at polder Taegye Do in North Korea. 2-24 May 1989</p>	<p>D5 9 003/IX-3 Access road in polder Taegye Do in North Korea. 2-24 May 1989</p>
			
<p>D5 9 004/IX-4 Access road in polder Taegye Do in North Korea. 2-24 May 1989</p>			