TAIWAN



Source: esri

General

Taiwan consists of several islands located in East Asia. The main island makes up 99% of the total area. It is bordered by the People's Republic of China in the West, Japan in the Northeast, and the Philippines in the South. The area of Taiwan is 3.6 Mha (million hectares) with, in 2024, a population of 23.2 million, or 6.4 persons per ha (Wikipedia and United Nations, 2024).

Climate and geography

Taiwan lies on the Tropic of Cancer. Its general climate is marine tropical. The northern and central regions are subtropical, whereas the South is tropical. The average rainfall is 2,600 mm per year; the rainy season is concurrent with the onset of the summer East Asian Monsoon in May and June. The entire island experiences hot, humid weather from June through September. Typhoons are most common in July, August and September. During the winter (November to March), the Northeast experiences steady rain, while the central and southern parts of the island are mostly sunny (source: Wikipedia).

The main island is a tilted fault block, characterized by the contrast between the eastern two-thirds, consisting mostly of five rugged mountain ranges parallel to the east coast, and the flat to gently rolling plains of the western third, where the majority of Taiwan's population reside. The tectonic boundary that formed the mountain ranges is still active, and the island experiences many earthquakes, a few of them highly destructive (source: Wikipedia).

Taiwan contains four terrestrial ecoregions: Jian Nan subtropical evergreen forests, South China Sea Islands, South Taiwan monsoon rain forests, and Taiwan subtropical evergreen forests. The eastern mountains are heavily forested and home to a diverse range of wildlife, while land use in the western and northern lowlands is intensive (source: Wikipedia).

In several coastal areas substantial subsidence occurs, partly caused by extraction of deep groundwater under soft layers. Examples of such areas, expectation for the future and measures taken are, for example, given by Mong - Heiung (1983), Liu *et al*. (2004), Wang *et al*. (2018) and Wang (2025).

Existing polders

In the period 1625 – 1662 hydraulic projects, polders, bridges and roads have been constructed by joint Chinese and Dutch efforts (source: Wikipedia).

In a power point presentation by the Land Reclamation Administration Taiwan Provincial Government the polders are mentioned that are shown in Figure 1.



Figure 1. Distribution of reclaimed land in Taiwan (Land Reclamation Administration Taiwan Provincial Government)

In addition the Group Polder Development (1982) mentions the polders that are shown in Figure 2. For those polders they also gave data on area, year of completion and land use

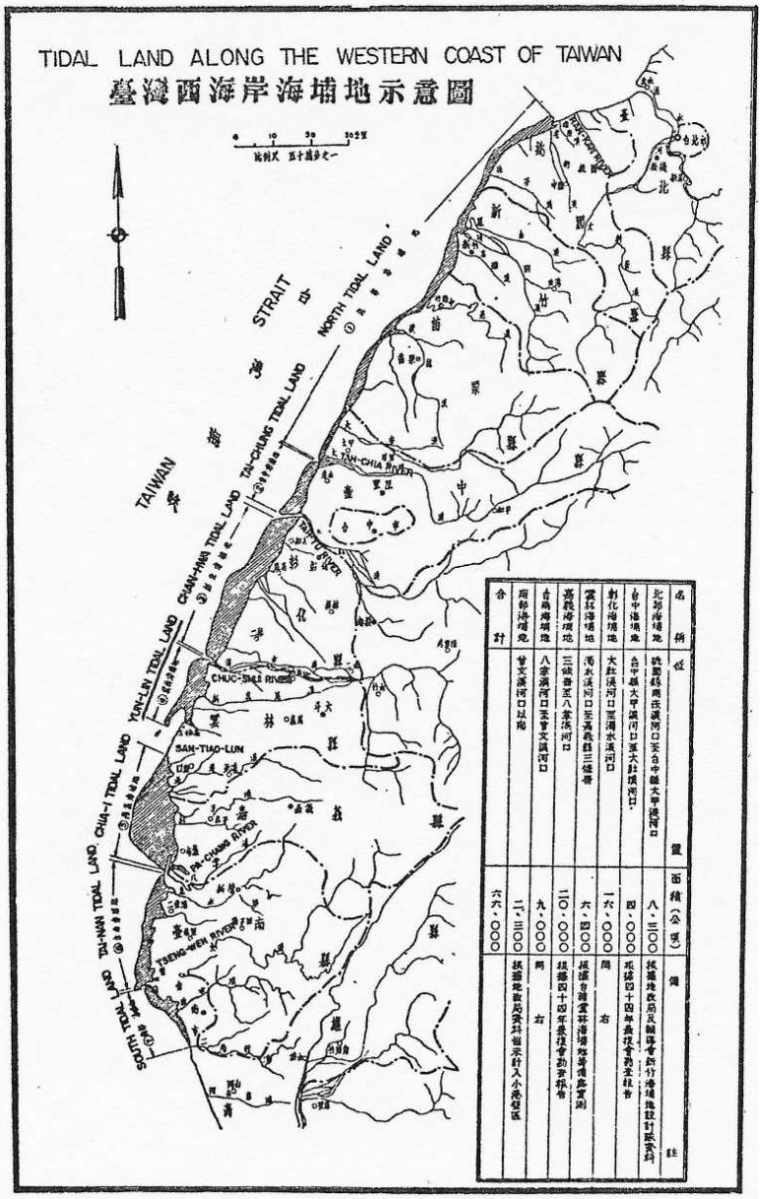


Figure 2. Tidal land development along the west coast of Taiwan (Group Polder Development, 1982)

Taiwan houses the polder with the highest pumping capacity per unit area in the world. It is the Shanhua Polder where the Tainan Science Park is located. The polder, with a development area of approximately 650 hectares, is located in the Yanshui River Basin between the Daoya and Shanhua Farm of Taiwan Sugar Corporation in Xinshi Township and Shanhua Town (Figure 3) (National Science and Technology Council, 1996).

General characteristics of the polders in Taiwan are shown in Table I. Table II shows the characteristics of the water management and flood protection systems of the existing polders.

Proposed polders

No proposed polders have been identified.

Drainage and flood protection

The planning principle for the Shanhua Polder was not to change the existing drainage conditions in the river basin. Because of this detention ponds have been constructed before the drainage outlets of the Tainan Science Park to reduce peak flow rates, thereby preventing an increase in downstream discharge volume due to the development of the park. One detention pond has been constructed in the Dazhou drainage system, two detention ponds in the Yanshui River Basin, and one detention pond in the Anshun drainage system (Figure 4).

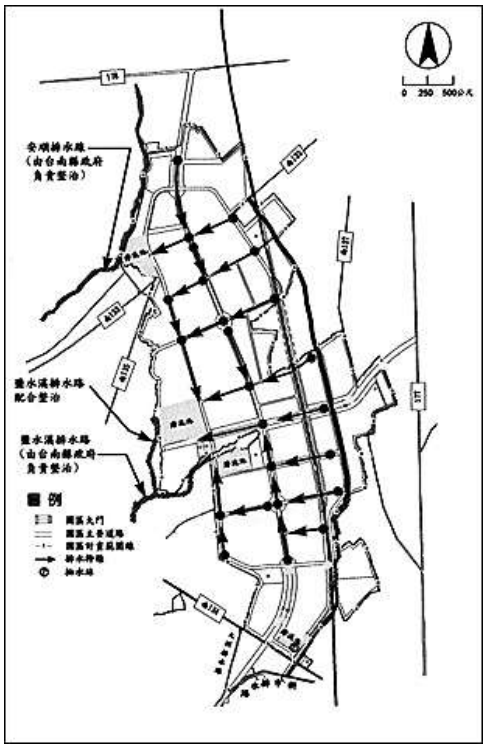


Figure 3. Drainage system layout of the Tainan Science Park in Shanhua Polder (National Science and Technology Council, 1996)

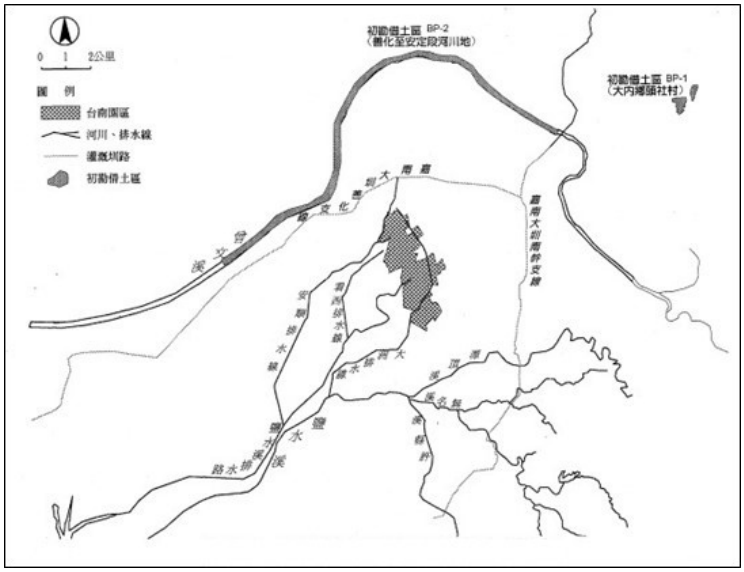


Figure 4. Discharge system in which Shanhua Polder with the Tainan Science Park is located (National Science and Technology Council, 1996)

In the proceedings of the Second Symposium on the Development of Deltaic Areas (1969) there is a paper on the procedures for determining sea-dike cross-sections in Taiwan. In the paper there is a brief description of the system of wave forecasting, especially designed for the west coast of Taiwan, and the application to dike design of experimental results on wave breaking and wave deformation in front of sea dikes. The paper shows cross-sections of four sea dikes (Figure 5).

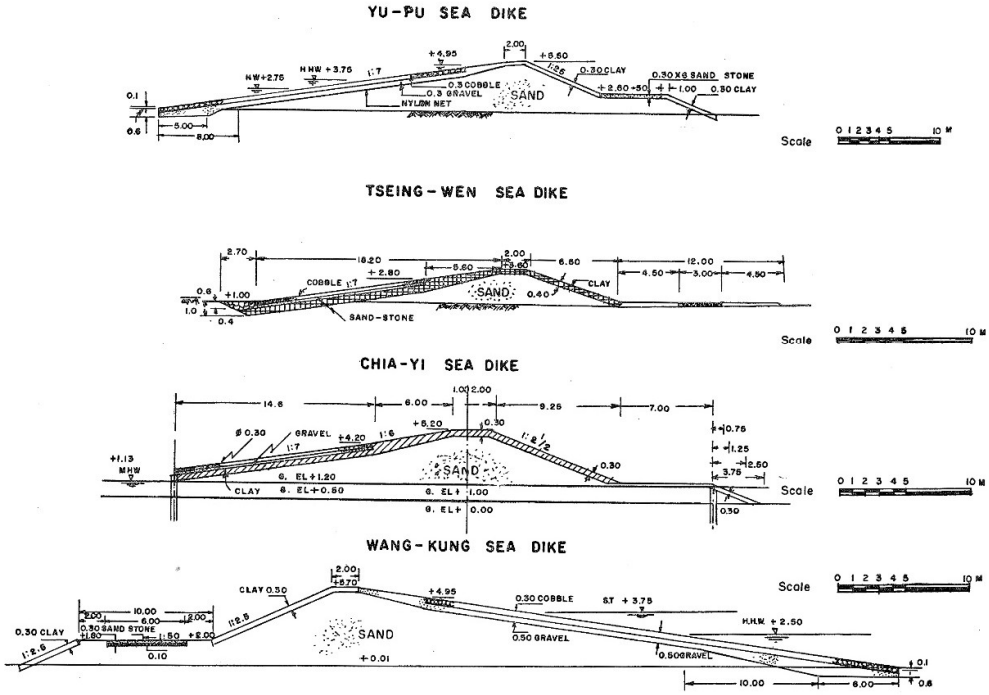


Figure 5. Cross-sections of the Yu-pu, Tseingwen, Chiayi and Wang-kung sea dikes (United Nations, Economic Commission for Asia and the Far East, 1969)

Location of the polders in Taiwan as shown on the World polder map

The location of the polders in Taiwan is shown in Figure 6.



Figure 6. Location of the polders in Taiwan (source: esri – Batavialand)

The pictures by Prof. Adriaan Volker are shown in Table III. The pictures by Prof. Bart Schultz are shown in Table IV.

Acknowledgement

The author likes to thank Prof. Hsiao-Wen Wang for providing information on the polders in Taiwan.

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Bart Schultz

Lelystad, October 2026

Table I. General characteristics of existing polders in Taiwan

Name	Reclamation	Area in ha	Type *)	Latitudes	Longitudes	Elevation in m+MSL	Land use
Ao-Ku Polder	1960	1,000	LGS	23° 50' N	120° 17' E	0	
Chen-Wun Polder	1963	1,600	LGS				Fishery
North Polder	1966	314	LGS				Agriculture and Fishery
Wanggong Polder	1968	462	LGS	23° 58' N	120° 20' E	0	Agriculture
Yu-Pu Polder	1971	820	RLL	24° 08' N	120° 28' E	3	Rural area
Tai-Hai Polder	1974	777	LGS				Fishery
Chi-Ku I & II Polder	1977	750	LGS				Salt pan
Ho-Mei Polder	1978	160	LGS	24° 07' N	120° 30' E	11	Urban area
Changhua	1993	260	RLL	24° 04' N	120° 32' E	13	Urban area
Yunlin	1998	888	LGS	23° 43' N	120° 46' E	0	Urban area
Chiayi		392	RLL	23° 29' N	120° 27' E	33	Urban area
Chiayi City		33	RLL	23° 29' N	120° 27' E	33	Urban area
Chilung		2					
Choshui Fan			RLL	23° 49' N	120° 18' E		Multiple land use
Hsin Chu		266	LGS	24° 49' N	120° 55' E	3	
Hualien		2,327	RLL	23° 54' N	121° 35' E	20	Rural area
I-lan		159	RLL	24° 45' N	121° 48' E	3	Rural area
Kaohsiung		49	LGS	22° 36' N	120° 19' E	2	Urban area
Linbian		4,000	LGS	22° 25' N	120° 31' E	-1	
Miaoli		837	RLL	24° 38' N	120° 46' E	4	Rural area
Nantou		1,032	RLL	23° 55' N	120° 41' E	78	Urban area
Penghu		37	RLL	23° 36' N	119° 39' E	3	Rural area
Pingtung		645	RLL	22° 40' N	120° 30' E	12	Urban area
Shanhua Polder		650	RLL	23° 6' N	120° 17' E		Tainan Science Park
Taichung		1,144	RLL	24° 13' N	120° 32' E	4	Rural area
Taichung City		64	RLL	24° 09' N	120° 40' E	78	Urban area
Tainan		139	LGS	23° 01' N	120° 10' E	0	Rural area
Tainan City		65	RLL	23° 00' N	120° 13' E	19	Urban area
Taipei		269	LGS	25° 08' N	121° 29' E	-3	Rural area
Taipei City		7	LGS	25° 14' N	121° 38' E	1	Urban area
Taitung		1,870	RLL	22° 45' N	121° 10' E	4	Urban area
Taoyuan		33	RLL	24° 59' N	121° 18' E	100	Urban area
Tseingwen							

Total		20,667					

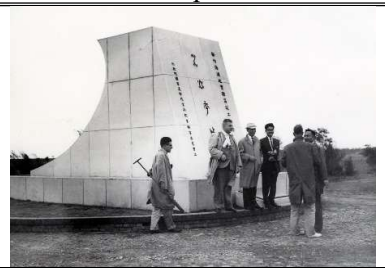
*) RLL = reclaimed low-lying land; LGS = land gained on the sea; DL = drained lake

Table II. Characteristics of the water management and flood protection system of existing polders in Taiwan

Name	Design criteria in chance of occurrence/year							
	Water management						Flood protection	
	Drainage					Irrigation	Rural	Urban
	Type	Design criterion	Percentage of open water	Discharge capacity				
				m^3/s	mm/day			
							1/100	
Ao-Ku Polder	LGS						1/100	
Chen-Wun Polder	LGS						1/100	
North Polder	LGS						1/100	
Wanggong Polder	LGS						1/100	
Yu-Pu Polder	RLL						1/100	
Tai-Hai Polder	LGS						1/100	
Chi-Ku I & II Polder	LGS						1/100	
Ho-Mei Polder	LGS							1/100
Changhua	RLL							1/100
Yunlin	LGS							1/100
Chiayi	RLL							1/100
Chiayi City	RLL							1/100
Chilung							1/100	
Choshui Fan	RLL						1/100	
Hsin Chu	LGS						1/100	
Hualien	RLL						1/100	1/100
I-lan	RLL						1/100	
Kaohsiung	LGS							1/100
Linbian	LGS						1/100	
Miaoli	RLL						1/100	
Nantou	RLL							1/100
Penghu	RLL						1/100	
Pingtung	RLL							1/100
Shanhua Polder	RLL				2000			
Taichung	RLL						1/100	
Taichung City	RLL							1/100
Tainan	LGS						1/100	
Tainan City	RLL							1/100
Taipei	LGS						1/100	
Taipei City	LGS							1/200

Taitung	RLL							1/100
Taoyuan	RLL							1/100
Tseingwen								

Table III. Pictures on polders and lowlands in Taiwan by Prof. Adriaan Volker

			
A6 040/XI.6.40 Pilot Polder Hsinchu, Taiwan, 22 November 1962	A6 041/XI.6.41 Pilot Polder Hsinchu, Taiwan, 22 November 1962	A6 042/XI.6.42 Group picture in front of the railway station of Taichung, 23 November 1962	A6 043/XI.6.43 Group picture in front of the railway station of Taichung, 23 November 1962
			
A6 044/XI.6.44 Group picture in front of a Bhoeda statue, 23 November 1962	A6 045/XI.6.45 Prof. Adriaan Volker at a boat in Tainan, 25 November 1962		

*) Batavialand/orginal

Table IV. Pictures on polders and lowlands in Taiwan by Prof. Bart Schultz

			
D6 12 001/XII-1 Dike along a river close to the mouth near Hualien, 20 – 26/6 1998	D6 12 002/XII-2 Dike along a river close to the mouth near Hualien, 20 – 26/6 1998	D6 12 003/XII-3 Dike along a river close to the mouth near Hualien, 20 – 26/6 1998	D6 12 004/XII-4 Road at the inner side of a dike along a river close to the mouth near Hualien, 20 – 26/6 1998
			
D6 12 005/XII-5 Road at the inner side of a dike along a river close to the mouth near Hualien, 20 – 26/6 1998	IMG_3301 Dike and discharge sluice near due to subsidence inundated land north of Tainan, 2 August 2016	IMG_3302 Dike and discharge sluice near due to subsidence inundated land north of Tainan, 2 August 2016	IMG_3303 Dike and discharge sluice near due to subsidence inundated land north of Tainan, 2 August 2016
			
IMG_3304 Due to subsidence inundated land north of Tainan, 2 August 2016	IMG_3311 Fish ponds north of Tainan, 2 August 2016	IMG_3312 Fish ponds north of Tainan, 2 August 2016	IMG_3313 Fish ponds north of Tainan, 2 August 2016

Table IV. Pictures on polders and lowlands in Taiwan by Prof. Bart Schultz (continued)

			
IMG_3314 Fish ponds north of Tainan, 2 August 2016	IMG_3315 Fish ponds north of Tainan, 2 August 2016	IMG_3317 Fish ponds north of Tainan, 2 August 2016	IMG_3318 Fish ponds north of Tainan, 2 August 2016
			
IMG_3319 Artificial dune to protect Haomiliao Wetland, 2 August 2016	IMG_3320 Artificial dune to protect Haomiliao Wetland, 2 August 2016	IMG_3321 Artificial dune to protect Haomiliao Wetland, 2 August 2016	IMG_3322 Artificial dune to protect Haomiliao Wetland, 2 August 2016
			
IMG _3323 Artificial dune to protect Haomiliao Wetland, 2 August 2016	IMG_3324 Fish ponds behind artificial dune to protect Haomiliao Wetland, 2 August 2016	IMG_3325 Artificial dune to protect Haomiliao Wetland, 2 August 2016	IMG_3326 Artificial dune to protect Haomiliao Wetland, 2 August 2016

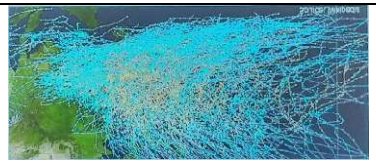
Table IV. Pictures on polders and lowlands in Taiwan by Prof. Bart Schultz (continued)

			
IMG_3327 Dam to protect Haomiliao Wetland, 2 August 2016	IMG_3328 Dam to protect Haomiliao Wetland, 2 August 2016	IMG_3341 Fish ponds behind artificial dune to protect Haomiliao Wetland, 2 August 2016	IMG_3344 Hydraulic laboratory of Tainan, 2 August 2016
			
IMG_3345 View of one of the canals of the Tainan Science Park. Computer chips are produced here. The park is located in a polder with as far as I know the largest pumping capacity per unit area in the world, 4 August 2016	IMG_3346 Pumping station of the Tainan Science Park. Computer chips are produced here. The park is located in a polder with as far as I know the largest pumping capacity per unit area in the world, 4 August 2016	IMG_3347 Pumping station of the Tainan Science Park. Computer chips are produced here. The park is located in a polder with as far as I know the largest pumping capacity per unit area in the world, 4 August 2016	IMG_3348 One of the canals of the Tainan Science Park. Computer chips are produced here. The park is located in a polder with as far as I know the largest pumping capacity per unit area in the world, 4 August 2016

Table IV. Pictures on polders and lowlands in Taiwan by Prof. Bart Schultz (continued)

			
IMG_3349 One of the canals of the Tainan Science Park. Computer chips are produced here. The park is located in a polder with as far as I know the largest pumping capacity per unit area in the world, 4 August 2016	IMG_3350 One of the canals of the Tainan Science Park. Computer chips are produced here. The park is located in a polder with as far as I know the largest pumping capacity per unit area in the world, 4 August 2016	IMG_3351 One of the canals of the Tainan Science Park. Computer chips are produced here. The park is located in a polder with as far as I know the largest pumping capacity per unit area in the world, 4 August 2016	IMG_3352 One of the canals of the Tainan Science Park. Computer chips are produced here. The park is located in a polder with as far as I know the largest pumping capacity per unit area in the world, 4 August 2016
			
IMG_3353 Office of the management authority with in it the pumping station of the Tainan Science Park. Computer chips are produced here. The park is located in a polder with as far as I know the largest pumping capacity per unit area in the world, 4 August 2016	IMG_3354 Name plates related to the water management of the Tainan Science Park. Computer chips are produced here. The park is located in a polder with as far as I know the largest pumping capacity per unit area in the world, 4 August 2016	IMG_3355 Inlet of the Tainan Science Park. Computer chips are produced here. The park is located in a polder with as far as I know the largest pumping capacity per unit area in the world, 4 August 2016	IMG_3356 Inlet of the Tainan Science Park. Computer chips are produced here. The park is located in a polder with as far as I know the largest pumping capacity per unit area in the world, 4 August 2016

Table IV. Pictures on polders and lowlands in Taiwan by Prof. Bart Schultz (continued)

			
Erodible coast where research on coastal protection measures is being done near Tainan by the Sixth River Management Branch, Water Resources Agency, Ministry of Economic Affairs, 20 November 2024	Erodible coast where research on coastal protection measures is being done near Tainan by the Sixth River Management Branch, Water Resources Agency, Ministry of Economic Affairs, 20 November 2024	Erodible coast where research on coastal protection measures is being done near Tainan by the Sixth River Management Branch, Water Resources Agency, Ministry of Economic Affairs, 20 November 2024	Erodible coast where research on coastal protection measures is being done near Tainan by the Sixth River Management Branch, Water Resources Agency, Ministry of Economic Affairs, 20 November 2024
			
Outfall of a polder area in the Cigu Lagoon near Tainan, 20 November 2024	Outfall of a polder area in the Cigu Lagoon near Tainan, 20 November 2024	Typhoon tracks from 1980-2005 in the area where Taiwan is located (source: Kao Shu Hwang)	