Making Room to Settle

How water technologies reshape places and communities

GHW.9.2 "Identify and describe ways in which humans have used technology to modify the physical environment in order to settle areas in different world regions..."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB In each paragraph, underline the technology and the physical change it makes, circle a benefit for settlement, and write P beside one cost to people and E beside one cost to land, water, or wildlife.

When Water Shapes a Settlement

(1) Along the Dutch coast, some land that supports homes and farms was once shallow sea or marsh. For centuries, residents have built dikes to keep seawater out and used windmills, and later electric pumps, to drain enclosed areas called polders. Drainage lowers the water table and turns wet ground into usable land. Yet dried peat soils can sink, making low areas harder and more expensive to protect. Pump failures or storm surges can flood homes and fields. These projects helped communities expand, but they also require constant maintenance and have changed coastal wetlands that support wildlife.

(2) In southern Egypt, the Aswan High Dam, completed in 1970, created a reservoir called Lake Nasser. By holding back the Nile's seasonal floods, the dam made year-round irrigation and more reliable electricity possible, supporting farms and towns downstream. Reservoir water flooded villages and ancient sites, and many Nubian residents were forced to relocate. The dam also traps much of the river's sediment. Downstream fields receive less natural silt, so farmers depend more on manufactured fertilizer, while reduced sediment delivery contributes to erosion in the Nile Delta. A technology that stabilizes water supplies can thus shift costs to other places and people.

(3) On the Arabian Peninsula, Dubai has grown despite scarce natural freshwater. Desalination plants draw seawater from the Persian Gulf, remove salts, and pipe freshwater into homes and businesses. This engineered water supply helps support a large city in a dry region, although producing it takes substantial energy. Plants return concentrated salty water, called brine, to the sea; poorly dispersed brine can harm marine life near discharge points. Energy production can also add greenhouse gases when fossil fuels power the process. For residents, a steady supply brings opportunities, but dependence on complex plants makes breakdowns and high operating costs serious concerns.

2 ANSWER WITH EVIDENCE

Use the passage

1. How do dikes and pumps change land along the Dutch coast, and what risk does that change create for residents?

2. How did the Aswan High Dam help downstream settlements while imposing a cost on another community?

3. How does desalination support settlement in Dubai, and how can it affect the nearby sea?

4. Compare the Dutch polders and the Aswan High Dam: How does each control water, and what physical cost can follow?

3 YOUR TURN

Your own words

A steep mountain valley has little level land and heavy seasonal rain. Propose a technology that could make settlement possible, then explain how it would change the land, one benefit for residents, one risk to the land or water, one effect on people, and a way to reduce a risk.

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PART 1 · READ AND MARK

In each paragraph, underline the technology and the physical change it makes, circle a benefit for settlement, and write P beside one cost to people and E beside one cost to land, water, or wildlife. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How do dikes and pumps change land along the Dutch coast, and what risk does that change create for residents?	**Dikes keep seawater out, and pumps drain enclosed land for homes and farms. The drained land can sink, increasing flood risk and the cost of protection.**
2	How did the Aswan High Dam help downstream settlements while imposing a cost on another community?	**It controlled floods and supported year-round irrigation and electricity downstream. Lake Nasser flooded villages, forcing many Nubian residents to relocate.**
3	How does desalination support settlement in Dubai, and how can it affect the nearby sea?	**It turns seawater into freshwater for homes and businesses in a dry region. Brine returned to the sea can harm marine life if it is poorly dispersed.**
4	Compare the Dutch polders and the Aswan High Dam: How does each control water, and what physical cost can follow?	**Dikes and pumps keep seawater out and drain Dutch land, but drained peat can sink. The dam holds back Nile floods, but it also traps sediment, contributing to erosion in the Nile Delta.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Residents could build stepped terraces on a mountainside to create level sites for homes and gardens. The terraces would cut into the slope and need retaining walls to hold the soil in place. More families could live near their gardens, but heavy rain might wash soil downhill if water collects behind the walls. Building the terraces could also reduce the land available to people who graze animals on the slope. Drainage channels and consultation with those land users could reduce these risks.

Accept other accurate physical and human impacts supported by the passage. For Your Turn, accept a feasible technology if the response explains its physical change, a settlement benefit, a land or water risk, an effect on people, and a relevant way to reduce a risk.