Aswan Dam

Aswan Dam - Location

The Aswan Dam is built on the River Nile, just south of the city of Aswan in Egypt. There are actually two dams at Aswan. The Aswan Low Dam that was completed in 1902 and the Aswan High Dam that was completed in 1970. The Low Dam is nearer to Aswan than the High Dam. When people talk about the Aswan Dam, they are usually referring to the newer and bigger Aswan High Dam.

Aswan Dam - Background

The High Dam was constructed between 1960 and 1970. Its aim was to increase the amount of hydroelectric power, regulate the flooding of the Nile and increase agricultural production.

The Aswan High Dam is 3,830 metres long, 980 metres wide at the base, 40 metres wide at the crest (the top) and 111 metres tall. It contains 43 million cubic metres of material. At maximum, 11,000 cubic metres per second of water can pass through the dam. The reservoir, named Lake Nasser (named after Egypt's president at the time), is 550 km long and 35 km at its widest with a surface area of 5,250 square kilometres. It holds 111 cubic kilometres of water.

ADVANTAGES OF ASWAN DAM	DISADVANTAGES OF ASWAN DAM
The building of the dam has allowed farming to continue, even during drought years e.g. 1972 and 1973. This reduces the dependency on food imports.	Up to 100,000 Nubian (indigenous Egyptians) were forced to move from their ancestral homes.
Up to 3.4 million hectares have been irrigated by the Nile, increasing the agriculture output of Egypt.	Evaporation of water has increased with the construction of the Aswan Dam and Lake Nasser. It is estimated that about 10% of the water is lost through evaporation.
The hydroelectric power accounts for 45% of Egypt's energy needs. This figure will obviously reduce as the Egyptian economy develops and the size of the Egyptian population increases.	Deposition of sediment within Lake Nasser is estimated at 100 million tonnes each year. The increased sedimentation may put stress on the dam, reduce the depth of the lake and therefore the amount it can store and also prevent the nutrients from reaching farmland downstream.
The dam has improved navigation upstream and downstream, Lake Nasser is now easily navigated and there are less seasonal variations downstream as the amount of water released is regulated.	There has been some increase in clear water erosion below the dam i.e. erosion is still taking place but there is no deposition to replace the eroded material.
The improvement in navigation has increased tourism on the River Nile. The dam itself has become an important tourist attraction along with the temples that line the river.	The Nile delta is eroding at 25mm a year (no sediment to be deposited). This might sound a small amount, but the erosion maybe further compounded by rising sea levels.
The amount of fishing behind the dam in Lake Nasser has increased supporting the local fishing industry.	It is estimated that $100 million worth of artificial fertilisers have to be used every year to replace the nutrients (alluvium) trapped behind the dam. This obviously has an economic cost, but there is also the environmental cost of using chemicals and possibly the social cost of people consuming the chemicals.
The flood control of the dam saved lives in 1965, 1965, 1975 and 1987. Also less flooding means that there are no flood repair costs and insurance premiums are also cheaper.	The changing ecosystems have reduced the amount of fish (overfishing and rising population also play a part) being caught. Sardine yields are down by 95% causing 3,000 jobs to be lost.
The building and maintenance of the dam has created many jobs and taught local workers new skills.	The increase in the amount of standing water has increased the amount of mosquitoes and the diseases that they carry e.g. malaria and dengue.
	Fertile agricultural land in Sudan was lost that Egypt had to pay compensation for.
	Poor management has increased the salinity of the water and soil. This has reduced crop yields by up to one third in some areas.
	Fertilisers, chemicals and waste is no longer flushed away by the Nile's annual floods.
	Archeological sites were either lost or had to be moved with the flooding of Lake Nasser e.g. Abu Simbel Temple.
	The total cost of building the dam was estimated at about $1 billion.
	Currently Egypt and Sudan get 90% of the Nile's water. Other countries that the Nile floes through are unhappy and have asked for more. This could lead to conflict or the amount of water Egypt receives, reducing. East Africa Countries Seek More Nile Water from Egypt - BBC article
	The weight of the dam and the reservoir has increased the amount of seismic stress in the area. Egypt's earthquake in November 1981 was actually blamed on the dam

CHANGES TO HYDROLOGY UPSTREAM OF DAMS

- Increased evaporation rates because reservoirs have a larger surface area than rivers.
- An increase in the amount of surface store (reservoirs are an artificial store).
- A reduction in the velocity of the river upstream. The river was effectively flowing into a stationary store of water.
- Increased sedimentation can lower the depth of the river and the reservoir. Again this will reduce velocity and may also reduce storage capacity.

CHANGES TO HYDROLOGY DOWNSTREAM OF DAMS

- River discharge will decrease because water is being held behind the dam.
- A rivers' discharge may become more regular (less extremes) because the flow of water is regulated.
- Clear water erosion may cause the bed of the river to lower. There is no sediment (load) to be deposited to replace erosion.
- The amount of load transported by the river will reduce because less sediment is reaching downstream.
- The salinity of the water and the ground may increase.
- The temperature of the water may reduce, as water released from reservoirs is often colder (reservoir deeper than river).
- The water may also be less oxygenated than natural free flowing water.
- With smaller discharge the velocity of the river may decrease, because the level of the river is further below bankfull discharge so the hydraulic radius is smaller.
- The amount of depositional landforms may reduce e.g. alluvial fans, levees, deltas and slip off slopes.