

Dams in South Africa

In South Africa we depend mostly on rivers, dams and underground water for our water supply. The country does not get a lot of rain, less than 500 mm a year. In fact, South Africa is one of the 30 driest countries in the world. To make sure that we have enough water to drink, to grow food and for industries, the government builds dams to store water.

A typical dam is a wall of solid material (like concrete, earth and rocks) built across a river to block the flow of the river. In times of excess flow water is stored behind the dam wall in what is known as a reservoir.

These dams make sure that communities don't run out of water in times of drought. About half of South Africa's annual rainfall is stored in dams. Dams can also prevent flooding when there is an overabundance of water. We have more than 500 government dams in South Africa, with a total capacity of 37 000 million cubic metres (m³) – that's the same as about 15 million Olympic-sized swimming pools!



There are different types of dams:

Arch dam: The curved shape of these dams holds back the water in the reservoir.

Buttress dam: These dams can be flat or curved, but they always have a series of supports of buttresses on the downstream side to brace the dam.

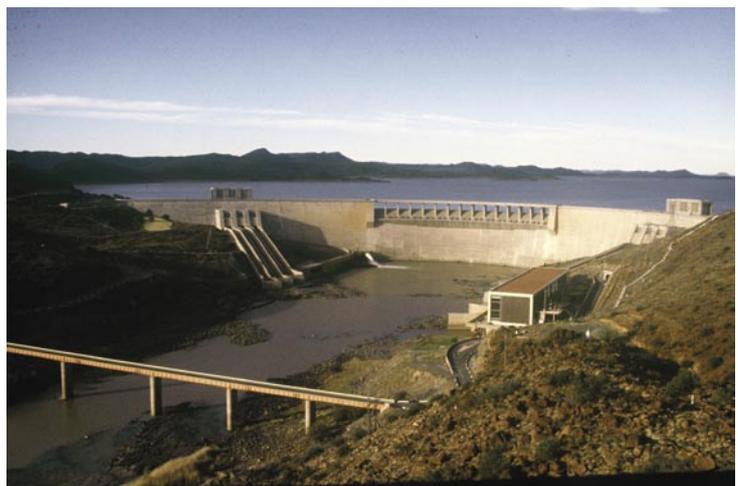
Embankment dam: Massive dams made of earth and rock. They rely on their weight to resist the force of the water.

Gravity dam: Massive dams that resist the thrust of the water entirely by their own weight. Usually made of concrete.

THE BIGGEST DAM IN SOUTH AFRICA

The Gariep Dam, in the Free State, is the dam with the largest storage capacity ever built in South Africa. Constructed in 1972, it stores water from the Orange River in a 100 km-long dam with a surface area of 374 km².

The dam can store about 5 500 million cubic metres (m³) of water. The dam is a combined gravity and arch dam, built entirely of concrete. The dam wall is 88 m high and contains about 1,73 million m³ of concrete. Gariep Dam is a double curvature structure, which means it is shaped like an egg shell.



The dam forms part of the Orange River Project, one of the largest African irrigation projects, which was started in 1966. Its purpose is to provide water for the irrigation of 22 400 hectares of land for agricultural use and, at the same time, to provide drinking water for the cities of Bloemfontein and Port Elizabeth.

DAMS AND THE ENVIRONMENT

Dams are not always a good thing. If they are not planned properly they can have devastating effects on rivers and freshwater ecosystems. It is very important that dam sites are chosen that will have the least impact on the environment. Dams can change the hydrology of the river and disturb the seasonal fluctuations. Dams also change daily flows by releasing water as a reaction to demands for irrigation, energy and so on. Furthermore, the transport of sediment along the river can be disrupted. This affects the morphology of the riverbed, downstream flood plains and even coastal deltas, and in turn impacts on the ecosystems in these areas.



Migratory fish species are said to be particularly vulnerable to dams, which block access to their spawning or feeding sites. These days, new dams include fish ladder structures built in the river to allow fish to get safely through the dam to the other side of the river.

For these reasons, the South African government requires that an environmental impact assessment be undertaken before any dam project, and an environmental management plan is drawn up to ensure the least damage to the environment and surrounding communities.

DAM FACTS AND FIGURES

- ◆ According to the World Commission on Dams there are an estimated 48 000 dams worldwide over 15 m high. About half of these are in China.
- ◆ There are about 1 500 dams under construction worldwide at present.
- ◆ It takes about four years to build one dam.
- ◆ The highest dam in the world is the Rogun Dam in Tajikistan which is 335 m high.
- ◆ The Three Gorges Dam, which is being built in China, will be the largest concrete dam in the world. When it is completed in 2009, the dam will stretch almost two kilometres across the Yangtze River and soar 183 m above the valley floor. The reservoir will be 563 km long.



Source: World Wildlife Fund

WATER WORDS

Ecosystem: An interconnected and symbiotic grouping of animals, plants, fungi and micro-organisms.

Flood plain: Area bordering a river which is flooded when the river rises over its normal banks.

Hydrology: Science that deals with the transportation and distribution of water in the atmosphere, on and beneath the earth's surface.

Sediment: Material deposited by water.