

The Highlands Water Project in Lesotho – water supply and hydroelectricity

Lesotho is an LEDC in southern Africa with an abundance of water. It is completely surrounded by South Africa, which is a much richer country and also short of water. This circumstance has led to the ambitious **Lesotho Highlands Water Project** – one of Africa’s largest engineering schemes.

The project involves damming some of Lesotho’s major rivers – most of which flow south into the Senqu (known to South Africans as the Orange River). This damming process has created large artificial lakes. The water from the lakes is then diverted north (through tunnels under the mountains) to South African rivers. These rivers lead to the Vaal Dam, which supplies the densely populated, urban and industrial region around Johannesburg and Pretoria.

South Africa pays Lesotho royalties of around US\$1.5 million a month for this water supply. The project was first thought of in the 1950s, but the treaty formalising the project was not signed until 1986.



Fig. 11.36 Lesotho is entirely surrounded by South Africa

The project’s objectives

- To provide funds for Lesotho by transferring water from the catchment of the Senqu/Orange river in Lesotho to meet the growing demand for water in South Africa’s major industrial and population centres.
- To generate hydroelectric power for Lesotho.
- To promote the general development of the remote and underdeveloped mountain regions of Lesotho.
- To provide water for irrigation and drinking water supply.

The project’s progress

Phase IA

- Completed in 1998.
- The Katse Dam was built on the Malibamatso River (see Fig. 11.26). It is the tallest dam in Africa at 186 metres high – the size of a 52-storey building.
- The Matsoku weir and tunnel collect water from an input on the Matsoku River to the east.
- A 48.2 kilometre-long tunnel transfers water from the Katse reservoir to the Muela hydroelectric power station in northern Lesotho.
- A delivery tunnel draws water from Muela and carries it underneath the Caledon River at the Lesotho/South Africa border and empties it into rivers that eventually flow into the Vaal River towards Johannesburg.

Phase IB

- Completed in 2002.
- The Mohale Dam was built on the Senquyane River.
- A tunnel transfers water between Mohale and the Katse reservoir.
- The system is interconnected in such a way that water may be transferred in either direction for storage in Mohale, or for transfer to South Africa through the Katse reservoir.



Fig. 11.37 A map of the Lesotho Highlands Water Project



Later phases

- Initially, three further dams were proposed further downstream after the Malimbamatso joins the Senqu River – at Mashai, Tsoelike, and Ntoahae.
- In 2007, further studies resulted in changes to the plan and proposed instead a dam on the Senqu, upstream from the confluence with the Malibamatso.

Why was Lesotho chosen for the project?

- The mountains of Lesotho have an average annual rainfall of over 1000 millimetre. This means that about 50% of the water flowing down the Senqu/Orange River falls as rain in Lesotho. Lesotho's water resources far exceed its possible future requirements, even allowing for possible future irrigation projects and improving living standards.
- The water originating in the mountains has good chemical quality and low sediment content.
- The project's dams have strong foundations on either the basalt (Katse, Mohale, Matsoku Dams) or the underlying hard sandstone.
- Deep, steep-sided valleys provide excellent dam sites.
- Local dolerite and basalt rocks can be crushed to produce good concrete for dam construction.
- The project is located in an area of low earthquake risk. One earthquake occurred in 1996, during the filling up of the Katse Dam at Mapeleng.

The impacts of the project

Conflicts in land use

Flooding such large areas of the country has led to conflicts with the local people. The rural mountain people farm and herd animals and are proud of their ability to survive in the harsh conditions. Phase 1A took away the houses, land and resources of 20 000 people, while Phase 1B affected another 7000. It severely strained the families and society of nearby villages. Various compensation arrangements have been put in place for villagers whose homes, fields or grazing areas have been flooded, although not unexpectedly there are grumbles that these promises have not been met, or that resettlement plans are unsatisfactory.

Positive impacts for people

The project provides money for the Lesotho government to spend on other development projects. In recent years, water from the scheme has been discharged into the Mohokare (Caledon) River to provide water for the capital, Maseru, in times of shortage. The Muela power station provides electricity for Lesotho. Hundreds of kilometres of tarred roads were built in order to improve access to the different construction sites. Together with gravel 'feeder' roads around the dams, these tarred roads continue to provide much improved communication for many villages in the mountains. Around 4000 people got temporary jobs

at the Katse Dam. Some were employed in construction and hundreds more flocked to the area to work in services for the workers, such as food vendors and shopkeepers. A thousand local people also worked at the Mohale Dam.

Vegetation

The new dams threatened the important alpine fauna of the Lesotho Highlands. The 17-hectare Katse Botanical Gardens was established in 1995, to rescue 149 plant species from the flooding. The Gardens try to promote enjoyment and a knowledge of the alpine flora of Lesotho through conservation, cultivation and propagation of the native plants. The gardens serve as an educational centre for local communities, students and scientists.

Animals

Flooding has a potential impact on land animals, and also on animals that live in the rivers whose water flow was affected by the dam construction. Any reduction in the flow of the river will endanger the existing species. An example is the Maluti Minnow, a small fish that is less than 5 centimetres in length. It enjoys very high-quality water, and is therefore a good indicator of water quality. The population of this fish is being monitored as an indicator of the effects of the dam construction.

Fig. 11.38 A herdsman above the Katse Dam Lake in the Lesotho Highlands



Fig. 11.39 A village above the Mohale Dam Lake

12 Write an account of the Lesotho Highland Water Project using the headings: Location, Advantages for Lesotho, Disadvantages for Lesotho.