

# »» Project Information

Implemented by:



## Water – Nicaragua

A sewage treatment plant cleans up Lake Managua

The Nicaraguan capital Managua is situated by a lake of the same name. But as the lake had long been heavily contaminated, it contributed little to the city's quality of life. Those living in the poor districts on the lakeshore fell ill as a result of using its waters for cooking and washing. The deployment of an innovative waste treatment plant, constructed with the support of KfW Development Bank, has cleaned up the lake.

the waste waters of the capital's approximately one million inhabitants. Operating a sewage treatment plant is generally a complex matter, in particular due to the need to dispose of the sludge. Nicaragua is adopting a new approach: a solar facility that dries out the sludge is being added to the treatment plant. The high level of solar radiation in Nicaragua is being used effectively. The innovative plant is currently the largest of its kind anywhere in the world.

The sewage sludge is now no longer stored at the local landfill site. This is a positive development since many poor families rummage through the landfill in search of recyclable materials. Had sewage sludge been dumped, this would have jeopardised their livelihoods. The solution would also have been expensive because the high water content of the sludge would have meant

### Context

The lake on Managua's doorstep was once regarded as the "world's biggest toilet". For well over 80 years, untreated household and industrial waste water was discharged into the lake. The capital of Nicaragua now has a million inhabitants who obtain their water from Lake Managua.

The families living directly on its shores are mainly poor. They draw water from Lake Managua to cook, wash, and irrigate their fields. Fish from the lake is used as food too, but is contaminated with pollutants.

To put an end to this unacceptable state of affairs, the Nicaraguan government already established an environmental protection programme in the 1990s. In 2005 this was supplemented with measures relating to water and waste water.

### Project approach

With the support of KfW Development Bank, the Inter-American Development Bank and the Nordic Development Fund, the Nicaraguan government has built a sewage treatment plant for Lake Managua. It purifies

<b>Project name</b>	Protecting Lake Managua
<b>Commissioned by</b>	Federal Ministry for Economic Cooperation and Development (BMZ)
<b>Country/Region</b>	Nicaragua
<b>Lead executing agency</b>	National Water and Sewage Authority (ENACAL)





The new treatment plant is again making Managua an attractive body of water on the capital's doorstep. Source: KfW

substantial transport costs. Furthermore, the microorganisms in the sludge would have constituted a considerable health hazard.

Instead, the sewage sludge is dried. The resultant granulate is rich in nitrates and phosphates. Potential ways of using the granulate, for example as a fertilizer or to improve soil quality in forest management, are currently being examined and discussed. If the granulate created from the dried sewage sludge could be employed as a fertilizer, this would help reduce the considerable volumes of emissions that otherwise result from fertilizer production.

Nicaragua's National Water and Sewage Authority is implementing the programme. It has concluded a 5-year management agreement with a well-known treatment plant operating company. Expertise and experience will be passed on to the future public operator to ensure the long-term functioning of the facility.

The treatment plant now purifies an average of 140,000 cubic metres of waste water every day. KfW Development Bank has contributed a total of EUR 28 million to the total EUR 36 million cost of the project.

### Impact

The water quality of Lake Managua has improved significantly over the last five years. The content of solids and phosphates has decreased. This is easy to recog-

nize: the water is clear again.

Now that it has been cleaned up, the lake adds value to the capital city. The unpleasant odours of the waters have disappeared. This has encouraged the city authorities to further develop the lakeshore. Salvador Allende Port has been expanded and both the inhabitants of Managua and tourists can now take boat excursions across the lake.

The main beneficiaries of the clean-up are the 120,000 people living directly on the lakeshore, most of whom belong to the poorer social strata.

The world's largest plant for drying sewage sludge by means of solar energy, located in Managua, is also a model for other countries with similar climatic conditions. The sustainable programme for the purification of Managua's waste water therefore won the 2010 Global Water Award sponsored by the company BEFESA.



#### Contact

KfW Group  
KfW Development Bank Palmengartenstrasse  
5-9  
60325 Frankfurt  
Germany  
Telephone 069 7431 - 9111  
[maria\\_elena.mendoza-chavez\\_extern@kfw.de](mailto:maria_elena.mendoza-chavez_extern@kfw.de)

KfW Office Managua  
Centro Ejecutivo San Marino, Módulo B-403  
Pista Jean Paul Genie  
Managua  
Nicaragua  
[marvin.chamorro@kfw.de](mailto:marvin.chamorro@kfw.de)