

WOMEN-LED FOG HARVESTING FOR A RESILIENT, SUSTAINABLE ECOSYSTEM | MOROCCO

While they have lived for centuries on rain and well-water, today the people of Ait Baamrane, on the edge of the Sahara Desert, rely only sporadically on this groundwater because it is no longer being replenished due to intense droughts. This is making life in this region increasingly difficult.

Dar Si Hmad, a women-led NGO in Morocco, designed and installed what is now the world's largest operational [fogwater harvesting system](#). It is an innovative solution to persistent water stress where fog is abundant, a technique inspired from ancient water practices. The Dar Si Hmad project provides accessible potable water to more than 400 people in five villages, most of them women and children.

The unique fog harvesting project is a successful model of a locally-driven, participatory climate change adaptation initiative, providing an environmentally friendly water source to combat the effects of desertification.

Key facts

- The project includes: 600 m² of nets to harvest fresh water from fog; 7 reservoirs of 539 m³ storage capacity; 6 solar panels; and 10,000+ meters of piping.
- Pre-paid water meters connected to 52 homes in 5 villages, serving more than 400 rural Berber residents, most of them women.
- Dar Si Hmad's female team leaders have conducted 20+ capacity-building workshops with rural Berber women to promote literacy and income-generating projects.
- Starting in January 2017, the project will be upgraded to CloudFisher, next generation fog-collection technology, and will connect 8 more villages to the grid.

The problem

The villages of Ait Baamrane in Southwest Morocco, where the Dar Si Hmad (DSH) project is located, lay on the edge of the encroaching Sahara Desert. Despite thousands of years of continued inhabitation and resilience, the impacts of climate change have become a major stressor on communities.

Climate change-induced droughts push men to migrate to urban centers in search of work, and women and children now make up the majority of the dwindling permanent residents in villages. Prior to the fog-collection project, most women spent 3+ hours/day retrieving water from distant, depleted wells, which seriously constrained their lives.

The solution

For 10 years, DSH's women-led team has conducted research and led development initiatives in the region, in close collaboration with various local and international

women (including engineers, humanists, researchers, scientists), to determine the feasibility of harvesting water from fog.

Fog harvesting, fog catching, and fog milking are all names for a long-established and proven scientific technique called fog collection. This technique uses specialized mesh, hung between two poles, to trap the water droplets in fog. The wind pushes fog through the mesh, where droplets are trapped, condense, fall, and amass in a container placed at the base of the unit. Drop-by-drop, they constitute a substantial amount of water.

Once infrastructure was installed to collect and distribute fog water, female villagers were equipped with mobile phones and trained to report on the fog water system, maintaining their ancestral role as managers of water resources. When the project was first launched, DSH and its partner provided monthly functional literacy and income-generation training to ensure that time saved by in-home water access is invested in future generations of female leaders.

Six-hundred square meters of fog-trapping nets currently capture an average of 6,300 liters of water/day, more than enough to service 400 residents. There are many more villages that need potable water, so DSH will shortly (January 2017) install next-generation CloudFisher nets which are capable of doubling fog water production over the same net surface. Over the next 18 months DSH will install 20 CloudFisher nets at the project site, making it the first in the world to utilize this newly-developed fog collection technology.

Moroccan Derhem Holding, USAID and Munich Re are the major financial supporters of DSH's fog project. Other institutions that have partnered with the project include the Climatology Department at University of la Laguna in Spain, Tata Energy, Munich Re Foundation, the WasserStiftung team, WPI, and Tifawin Institute, Colorado.

Helping the planet

The fog-water passes through UV Filtering, sand and cartridge filters. All this equipment is powered by 6 solar panels and operated out of DSH's Fog Observatory Center, which is a fully integrated rock-built ecological center operating with fog-water, 2 solar panels for electricity, and a traditional-sceptic model toilet. The fog water does not need to be treated as it is pure water, free from contaminants and pollutants.

Helping people

The pilot project is servicing 5 villages located in the provinces of Tnine Amellou, Qaidat Mesti, and Sidi Ifni, Southwest Morocco. The year-round resident population is about 400 individuals, including approximately 40 large households. In the summer when villages are fully occupied, the project services a total of 92 large households, in addition to the livestock in the region.

Based on previous studies by DSH evaluating the impact of water being delivered to rural households, women and girls feel empowered; and there is less degradation of

the natural environment and fewer water-borne diseases, especially among children as mothers have testified through our ongoing evaluation of the project.

Spillover effect

Ten years of applied research and feasibility studies conducted by Dar Si Hmad confirms that harvesting potable water from fog can be successfully expanded to multiple surrounding hillsides, providing clean water to an extended network of rural Berber villages that suffer from water stress due to persistent climate change-induced droughts.

DSH is currently helping build two new projects in other regions of Southwestern Morocco at the request of local organizations. It plans on creating a Fog-Water Network as it teaches and transfers knowledge and as new local associations call upon it to help build new initiatives.

In March 2016, DSH in partnership with Wasserstiftung, funding has been awarded by the German Ministry of Economic Cooperation and Development to replace the current infrastructure with nets that will enhance fog-collection capacity twofold over the same surface area of netting at the current project site. Over the next two years, DSH will expand the fog-collection project to 8 new villages, providing access to potable water to 500+ new beneficiaries.

More information

Digital assets are available for download at: <http://bit.ly/m4c-assets>

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