

1 In which country/region is the project taking place?

In Eritrea. Eritrea is situated on the Horn of Africa, northeast of Ethiopia. The capital is Asmara. The German WasserStiftung (“Water Foundation”) is conducting pilot projects in the towns of Seidici, Arborobu, Nefasit and Embatkala. The four towns are located within a radius of about 30 kilometres from Asmara.

2 Why Eritrea?

After 30 years of war between Eritrea and Ethiopia, Eritrea became independent in 1993. As a consequence of a renewed border war with Ethiopia in 2000 and several years of drought, Eritrea is currently suffering from a severe economic crisis. Almost one million people (about one third of the total population) were uprooted during the war. They are now slowly starting to return to their homes. Humanitarian organisations have estimated that in 2004 about 60% of the population were in need of relief and therefore entitled to food aid.¹

3 Why use fog nets rather than wells?

Outside the rainy season, water supply is a major problem in the project area (the highlands around Asmara, which are about 2,000 to 2,500 m above sea level). People settled in the highlands because they offered good protection from malaria, but also to seek refuge from the soldiers. Water holes and wells are scarce in the highlands, and the water quality is often very poor. Many people depend on water being brought by tankers from Asmara. Due to the cost of transport, this water is twice as expensive as in the capital. Moreover, women and girls have to walk long distances from the mountains down to the valleys to buy water from the truck or fetch it from one of the few wells. Also, there is a lack of facilities to store rain water during the rainy season.

Due to the proximity of the sea there is a lot of fog from November through March, which, however, does not produce any precipitation. Drizzling rain is common in April. The rainy season starts in June or July and continues through August. The fog areas in Eritrea are very extensive, spanning a distance of about 500 kilometres. This provides great potential for the future installation of a much larger number of fog nets than already in place.

¹ Source: German Foreign Office, data as at October 2004.



The existing fog nets measure 1 m² each. Studies have shown that each fog net yields as many as 29 litres of water per day. Besides “harvesting” the fog, the nets also collect drizzle and rain during the rainy season, and thus make it possible to store rain water, too. After the evaluation stage, the plan is to install nets 40 m² in size and drain the collected water into pipes and cisterns to improve water supply during the dry season. In the fog season, each net is expected to yield about 200 litres per day. It is estimated that at least an equal amount of water will be collected during the rainy season.

4 Who are the project partners, and what references do they have?

The German foundation “WasserStiftung” (www.wasserstiftung.de): In several personal meetings with WasserStiftung representatives, the Munich Re Foundation gained detailed insight into their general activities and, in particular, the high quality of preparations for the Eritrean fog nets project. Mr. Frost, head of the WasserStiftung, has much experience in running local projects (e.g. in Sarajevo) and brings a high level of personal commitment to the task. Frost and Ms. Kerstin Anker, the project manager, have travelled to Eritrea several times to assess the solidity of the project first hand.

FogQuest (www.fogquest.org) is a Canadian non-profit organisation which has been active in the field of fog collection for about 15 years. FogQuest’s Executive Director, Toronto-based scientist Robert Schemenauer, and team members Pablo Osses and Pilar Cereceda from the universities of São Paulo and Chile have been instrumental in developing the technology. They build on decades of experience, having set up fog nets at 16 sites in 13 countries, including Peru, Ecuador, Chile, Namibia, Oman, Nepal and Yemen (Yemen is situated “opposite” Eritrea). FogQuest's supporters include the International Development Research Centre and Environment Canada. FogQuest will also be this year’s recipient of the WasserStiftung’s Hundertwasser award.

In Eritrea, WasserStiftung and FogQuest cooperate with the local NGO “Haben”. Haben is a non-profit organisation headed by Dr. Berhane Woldemichael. He studied economics in the UK, and started to build up his NGO in Asmara about six years ago. Haben cooperates with other organisations, including Care International. A nationally recognised NGO, Haben has sufficient local staff, who are trained by Pablo Osses to ensure sustainable use and maintenance of the nets. The aim is to enable local staff to set up additional nets in Eritrea without outside help. During their on-site visits, WasserStiftung representatives gained a first-hand impression of Haben’s high level of competence and its professional approach. This is, of course, also true for Pablo Osses, who installed the trial nets with the help of Haben staff over a period of three weeks.

5 How many people will be supplied with water by the planned project?

If 20 large nets are set up initially, their total surface would be 800 m², and the daily amount of collected water approximately 4,000 litres. This means that 28,000 litres of water could be collected per week. A cistern should therefore have a capacity of at least 30,000 litres. The cistern should be half filled at all times, which means that 15,000 litres of water would be available for consumption. Assuming a per-capita consumption of 3 litres a day, 15,000 litres would be enough to supply as many as 1,000 people with clean, mineralised water for a period of five days (3,000 litres per day). This quantity may increase depending on the amount of rainfall during the rainy season and the number of nets installed.

6 What is the cost per net? What is the cost of the required infrastructure (pipes, cistern, etc.)?

We expect a maximum cost of €500 per net. Additional costs are incurred for FogQuest's travel expenses, the construction of a cistern, and on-site training. We currently expect to spend a total of about €20,000 to €25,000 on this project. This is a maximum investment of €25 per person. In view of the fact that our partners in Eritrea have extensive experience with cistern construction, the related costs may even be lower than expected. The estimates are also influenced by the specific site chosen for setting up the first 20 nets. Currently, Arborobu and Seidici seem to be the most suitable locations. It is also planned to make the water collected available to schools.

7 What is the lifetime of a fog net? How much does it cost to replace a net? How much servicing do the fog nets need?

The nets will keep several years, depending on the weather. Only the mesh itself would have to be replaced, not the supporting structure. The exact cost depends on local availability of materials, but it would of course be much less expensive than replacing the whole structure. In addition, local people will be trained to maintain the nets when needed. The plan is to appoint wardens, who will regularly check on the nets, and to distribute the water at a low price. The income could be used to pay the wardens and to cover at least part of the servicing cost.

8 How will it be ensured that the money is used for its intended purpose? Who will prevent funds from being diverted to other uses?

All funds are administered by WasserStiftung and will only be released upon submission of a detailed cost statement by either FogQuest or Haben. Mr. Kifle Berhane, a WasserStiftung staff member, is responsible for on-site supervision.