Meteorologica Patterns and Fog Water in the Canary Islands and Morocco

M. V. Marzol (1), J. L. Sanchez Megía (2), A. Yanes (1), J. Bargach (1), and A. Derhem (3)
(1) La Laguna (Canary Islands), Geography, La Laguna, Spain (mmarzol@ull.es / 34922317723), (2) Agencia Estatal de Meteorología (sanchezmegia@inm.es), (3) Foundation Si Hmad Derhem (Casablanca) (jamila_bargach@usa.net; aderhem@usa.net)

The Stratocumulus cloud formation is very common in the Canary Islands (Spain) and on the Atlantic coast of Morocco. This cloud formation behaves as if it was fog when it comes into contact with the relief and its liquid content can be captured by artificial systems. The origin of this cloud formation is connected with the Azores anti-cyclone and with the anomalous structure of the low layers of the atmosphere caused by a subsidence thermal inversion.

The aim of this article is to define a pattern of the most favourable meteorological and atmospheric conditions for this cloud formation to appear. In order to do this, a database has been compiled with the information about the days on which water has been collected in Morocco since June, 2006. This was when the collaboration with the Si Hmad Derhem Foundation (Casablanca) began. As well as meteorological data and data on water quantities, weather maps, thermodynamic soundings and satellite images are also analysed. The following two sites were studied: Anaga, on the island of Tenerife, Canary Islands, 864 m a.s.l. and 4 km from the coast, and Boutmezguida, Morocco, 1,225 m a.s.l. and 30 km from the coast.

The research was conducted in three stages. The first stage consisted of looking for the most appropriate sites to obtain the greatest efficiency in fog water collection; the Standard Fog Collector (SFC, Schemenauer and Cereceda, 1994) was used for this purpose. The second stage consisted of studying the most favourable meteorological conditions for water collection where the Quarter Fog Collector (QFC, Marzol, 2002) connected to an automatic weather station providing information on temperature, humidity, precipitation, wind speed and direction and the amount of water collected on the netting every ten minutes was used to do this. The aim of the third stage, which was by nature an applied stage, was to construct large-sized fog collectors (Large Fog Collector, LFC) so that the water collected could be put to practical use. The third stage has already taken place in the Canary Islands, whereas work is still going on in Morocco on the second stage to determine the dominant wind direction during the periods of greatest water collection in order to orientate the LFCs. The fresh water will be used by a dispersed rural population living of agriculture, apiculture and livestock farming. All of these activities depend heavily on water, a resource which is getting scarcer because of the drying up of the wells and the long drought which is affecting this area of Morocco.

The results obtained, not only in the Canary Islands but also in Morocco, support the viability of artificially collecting part of the liquid content of clouds. The average daily fog water collection from this system is 7.5 l/m2/day in the Canaries, whereas this average is 7.9 l/m2/day in Morocco. There is a clear seasonal variation in the water collection: it is higher in the summer in the Canaries than in the winter whereas in Morocco more water is collected from March to June than in the remaining eight months.