

Dew-Fog as a supplementary source of water in the hilly terrain of Meghalaya, India

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Meghalaya State (meaning: the abode of clouds) in North-East India is located 4,267 feet above sea level receives the highest rainfall in the world. Today, Sohra, a district in Southern Meghalaya is known as the wettest desert on earth. With no trees or big reservoir to hold the runoff, rainwater runs down into Bangladesh. Sohra faces acute water shortage, especially during winter and tankers supply water in the lean months - from November to March - and sell water at 15 Indian rupees (about 20 cents) for a big bucket. Women walk for miles to collect drinking water from government-installed pipelines. The situation remains the same in many other districts in Meghalaya.

There is high moisture in the mountainous region of Meghalaya. To understand the true potential of Dew and Fog in the region as a supplement as a source of water in hilly terrain, an Action Research was undertaken in 2018. A hybrid model of Dew condenser (1 x 1 m) and Fog- condenser (1 x 1 m) was designed as a single unit named as standard Dew-Fog Condenser (SDFC). Both Dew and Fog yield can be monitored independently with this single unit.

SDFC were installed at two locations – Ram Krishna Mission School, Sohra district (N 25°17.159', E 91°42.982') and Phlangwanbroi district (N 25°15.260', E 91°29.930'). The installation work started in July 2018 with completion in September 2018. The study team has prior experience of working and installing 800 m² large Dew condensers on the ground at Kutch, India in 2005 with support from World Bank and technical guidance from OPUR, France.

At Sohra site, Dew was received for 52 times out of 62 nights with highest of 800 ml/m²/night while, Fog was observed on one night with a yield of 200 ml/m²/night. At Phlangwanbroi site, dew was received 40 times out of 51 nights were observed with highest dew yield of 210 ml/m²/night. While dew yield results are quite positive, we are still waiting for the fog to come in the study area.

The initial results show the potential of Dew-Fog both in the region that can be tapped and utilized as a supplementary source of water. The low-cost dew-fog systems would be designed and installed at school sites to make water available in lean season. The low-cost system in villages will be integrated with traditional bamboo irrigation system and low-cost bamboo green-house to cultivate vegetable in offseason and support the livelihood of small farmers.