



POLITECNICO
DI TORINO

Honors thesis

ARCHITECTURE FOR THE SUSTAINABILITY DESIGN

Abstract

**Water for Life: An Experiment on fog water harvesting for
the Po valley in the north of Italy**

Tutor

Gabriela Peretti

by

Lucas Bandeira Calixto

February 2015

The thesis aims to evaluate the potential of harvesting water from the fog present in the Po river valley in northern Italy, and eventually propose a project with such nature to enhance dynamicity, flexibility and sustainability of the water provision services of the region. For such, a thorough analysis of the economic impact of the project's final yield, water, is conducted in order to identify in which sectors of the economy could a water surplus make a major contribution. Then, the nature of fog itself is investigated, and its dependent factors, characteristics and behavior are reported. The state of the art of the fog harvesting technology – which has been in constant development since 1989, mostly in developing countries – is explained and critically evaluated, so to identify its strengths and weaknesses to propose a novel solution for the Italian context, which is highly contrasting to past fog water harvesting experiments, two of which are studied and commented.

The problem framing arises from the consideration of every single data collected previously, and the new project's goals determine that passive, state of art technology is insufficient for the Po valley. Therefore, the creation of the Dynamic Fog Harvester (DFC), powered by electricity and possessing a wind current generator in order to compensate for the weak local winds, is proposed. To maximize efficiency, an analysis of alternative fog harvesting methods aligned with shape studies proposes a more compact, but taller, funnel-like collector. The DFC's versatility will allow it to be located not only on the urban and semi-urban environments, but also as a building component, provided the building is immersed in an area where fog can provide water that falls within World Health Organization's drinking water standards for pH and heavy metals. The device proposal's calculated theoretical efficiency results as more than 10 times that of an average fog collector, being able to also host a variety of other integrated uses that either directly or indirectly benefits from the water surplus.

For further information please contact:
Lucas Bandeira Calixto, lucasbandeira92@hotmail.com