

## Partner search:

### Development and testing of a textile water harvesting system for agricultural irrigation

- Funding scheme: Catalan-German bilateral funding line
- Present partners: 2 German SMEs and 2 German research institutes

#### 1. Project abstract:

The technology of water extraction from the air, especially from fog through "nets", has been known for some time. Already in the 1980's Chilean fishermen first tested this method for obtaining water. Since the groundwater is sometimes very deep in the mountain region in Chile, well drilling is very costly. Access to water has thus proved difficult and the Chilean fishermen have adopted a meteorological observation: the rise of fog on hills and ridges. The mist, which is moved by the wind and the buoyancy, leaves droplets on the surface as it flows through trees, bushes and other structures. This observation led to the fishermen taking advantage of this effect by tying up their fishing nets, in order to separate the drops on the nets and thus have drinking and service water available. Since then, the water harvesting nets have been the subject of international research activities.

From the Chilean experience, different textiles were developed, which on the one hand have better strength and, on the other hand, should improve droplet deposition. The result of investigations by various institutes worldwide did not produce a uniform concept for the fog catcher.

Therefore, one topic of the intended project is to develop or improve **innovative net structures** for an optimized water droplet deposition. Furthermore, as it is well known that water from fog is not really clean the water has to be treated before using it in the agriculture environment.

This water **treatment system** should be based on biological materials like compostable membranes. Last but not least the assembled water has to be distributed for watering the plants. This means that the water harvested need to be assembled and distributed later or directly. This has to be automated so that water usage and water distribution is coordinated.

#### 2. Partner needs:

##### First company in Catalonia

The identified company needs to be able to develop new kind of textiles for this approach and should be able to produce such technical textiles as 3D-construction or layered construction. The diameter of filaments needs to be quite small ( $d=0.2$  mm), the shading factor of the textile needs to be around 55%. The new textile samples need to be tested at the THCologne concerning functionality under wind load and water content.

##### Second Company in Catalonia

This company is engaged in water distribution and irrigation systems. Water that is collected centrally on a rather hilly landscape by means of the fog catcher must be distributed on agricultural land. The aim is to develop an energy-efficient system for optimal use of the water and optimal irrigation, including capillary effects. This system should be as automated as possible and powered by solar power that is stored during the day. Important here are range, area coverage and plant irrigation with the lowest possible evaporation effects.