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"Global food security and food safety:
The role of universities"

Solar Sea Water Distiller for Use in Hydroponic Crops in Guajira, Colombia

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Abstract

Food security is the one of the main condition for the development of a society. In Colombia, Alta Guajira is an area with ethnic, cultural, political and economic conditions different from the rest of the country. The national survey of health and nutritional status of Colombia, 2010, confirms that in La Guajira the global malnutrition index is 11 %. Likewise, 3 % of children under 5 suffer from chronic malnutrition. One of the main causes of the deficit is the difficult access of water suitable for crops, animals and community consumption. Since 2008, this problem has been addressed from the political sphere, with government aid, different treaties and subsidised food systems for the affected society. Despite that, food security can increase from homes, implementing clean technologies, using local resources and promoting a change in the cultural perception of agriculture.

Uribía (Guajira, CO) is an area with desert characteristics. According to databases of the Institute of Hydrology, Meteorology and Environmental Studies (IDEAM) has average annual temperatures greater than 28°C, average RH between 72 % (±5) and annual average precipitation less than 500 mm, this value being the lowest in all the country. Using recyclable materials, the intention is to build a solar-powered distiller of sea water, taking advantage of the high thermal radiation available *in situ*. With the distilled water and mineral nutritive solutions, a continuous stepped type irrigation for hydroponic systems is parameterised. The system must be easily replicable, low cost, modular, with low environmental impact and that promotes the sustainable development of family farming.

The controlled conditions in hydroponic crops allow the permanent harvest of fruits, vegetables and medicinal herbs. The advantage of soilless crops lies in the ease of using irrigation techniques with moderate water consumption, a limiting factor in the region. In addition, in the long term, a micro economy can be stimulated with a greater technification of the crops, managing to supply the adjacent regions with first level products and minimal environmental impact, promoting the community development and life quality.

Keywords: Crops, distiller, Guajira, hydroponic, solar

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