

## OASIS: An Alternative Access to Potable Water, Renewable Energy and Organic Food

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**Abstract :** The tropical areas are places where there is scarcity of access to potable water and where renewable energies need further development. They also display high undernourishment levels, even though they are one of the resources-richest areas in the world. In these areas, it is common to count on great extension of soils, high solar radiation and raw water from rain, groundwater, surface water or even saltwater. Even though resources are available, access to them is limited, and the low-density habitat makes central solutions expensive and investments not worthy. In response to this lack of investment, rural inhabitants use fossil fuels and timber as an energy source and import agrochemical for soils fertilization, which increase GHG emissions. The OASIS project brings an answer to this situation. It supplies renewable energy, potable water and organic food. The first step is the determination of the needs of the communities in terms of energy, water quantity and quality, food requirements and soil characteristics. Second step is the determination of the available resources, such as solar energy, raw water and organic residues on site. The pilot OASIS project is located in the Vichada department, Colombia, and ensures the sustainable use of natural resources to meet the community needs. The department has roughly 70% of indigenous people. They live in a very scattered landscape, with no access to clean water and energy. They use polluted surface water for direct consumption and diesel for energy purposes. OASIS pilot will ensure basic needs for a 400-students education center. In this case, OASIS will provide 20 kW of solar energy potential and 40 liters per student per day. Water will be treated from groundwater, with two qualities. A conventional one with chlorine, and as the indigenous people are not used to chlorine for direct consumption, second train is with reverse osmosis to bring conservable safe water without taste. OASIS offers a solution to supply basic needs, shifting from fossil fuels, timber, to a no-GHG-emission solution. This solution is part of the mitigation strategy against Climate Change for the communities in low-density areas of the tropics. OASIS is a learning center to teach how to convert natural resources into utilizable ones. It is also a meeting point for the community with high pedagogic impact that promotes the efficient and sustainable use of resources. OASIS system is adaptable to any tropical area and competes technically and economically with any conventional solution, that needs transport of energy, treated water and food. It is a fully automatic, replicable and sustainable solution to sort out the issue of access to basic needs in rural areas. OASIS is also a solution to undernourishment, ensuring a responsible use of resources, to prevent long-term pollution of soils and groundwater. It promotes the closure of the nutrient cycle, and the optimal use of the land whilst ensuring food security in depressed low-density regions of the tropics. OASIS is under optimization to Vichada conditions, and will be available to any other tropical area in the following months.

**Keywords :** climate change adaptation and mitigation, rural development, sustainable access to clean and renewable resources, social inclusion

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