



Solar energy and the water, energy and food nexus

From 2017-2021 | Total budget € 30,000

Petrolina-Juazeiro case study

Water, energy and food are essential resources for society. Their integrated management, based on synergies and trade-offs, is determinant to meet the demand in the long term. Petrolina and Juazeiro are cities in the Brazilian semiarid where the Sobradinho hydropower (4,214 km² reservoir) and a fruit production centre (for Brazilian and international markets) coexist. Both activities depend on the São Francisco River and Sobradinho reservoir. Although the water demand for irrigation is intense, hydropower generation was given priority during the dry period 2012–2016. The water scarcity during these years caused conflicts as it reduced hydroelectricity generation and put fruit production at risk. Since solar irradiation is abundant, solar power plants may be used as a renewable energy alternative. Therefore, the research analyses scenarios of water management where floating solar panels are adopted in complementarity to hydroelectricity. The software Water Evaluation and Planning (WEAP) is used to model the scenarios. Results are represented in water, energy and food safety indicators to identify the strategies of integrated resource management to target SDGs 6, 7 and 12.

More information:

This PhD research is being developed with INPE (Brazilian National Institute for Space Research) – CCST (Earth System Science Center) The research integrates the Fapesp Thematic Project “Transition to sustainability and agriculture-energy-water nexus”.

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