research highlights

SOLAR ENERGY Hotspots in Tanzania Renew. Energy 113, 159-175 (2017)

More than 600 million people do not have access to electricity in sub-Saharan Africa. Despite high irradiance levels, solar power is not widely deployed. This is due to a number of interrelated factors, but an important one is the lack of energy data to support power planning and to promote the integration of renewable energy. Now, Ahmed Aly and colleagues from Aarhus University, Denmark, determine suitable areas for the deployment of solar energy in Tanzania, looking at two types of installations: concentrated solar thermal power and photovoltaics.

These technologies were selected as the most likely to be implemented using interviews with stakeholders from various backgrounds, such as governmental institutions, the private sector or local nongovernmental organizations. Concentrated solar power and photovoltaics have different technical requirements. For example, both of course require high irradiance, but concentrated solar power relies only on direct irradiance, whereas photovoltaics also harvest diffuse sunlight. In addition, concentrated solar power is often used to drive a steam turbine and therefore requires a cooling source, typically water. The researchers combine these requirements with others, such as the proximity to roads and transmission lines, and use a Geographic Information System analysis in combination with a multi-criteria decisionmaking technique to identify suitable areas for concentrated solar power and for photovoltaic installations, and from there, pinpoint hotspots for such installations. They also take into account the electricity demand, and show that optimal locations depend on the stakeholders' interests, contrasting a centralized, most-economical scenario and a demand-driven, decentralized scenario based around mines or large cities. The researchers suggest that further criteria such as capacity restrictions, financial incentives and social acceptability could also be included in future studies to determine the best locations for solar power in Tanzania.

Elsa Couderc