Example of Site Suitability Study for Kenya

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A study of the annual average and seasonal variation of DNI should be one of the first considerations before planning a project in a particular location.

For solar cooker applications, the direct radiation (Direct Normal Irradiance, DNI) is an appropriate metric for the radiation required for focusing of light by reflectors. For instance, in the case of Kenya, the map in Figure 1 shows that a project is more likely to be successful in the Kakuma refugee camp in western Kenya than in the Dadaab camp in eastern Kenya. Nairobi also lies in the region of lower annual average DNI.

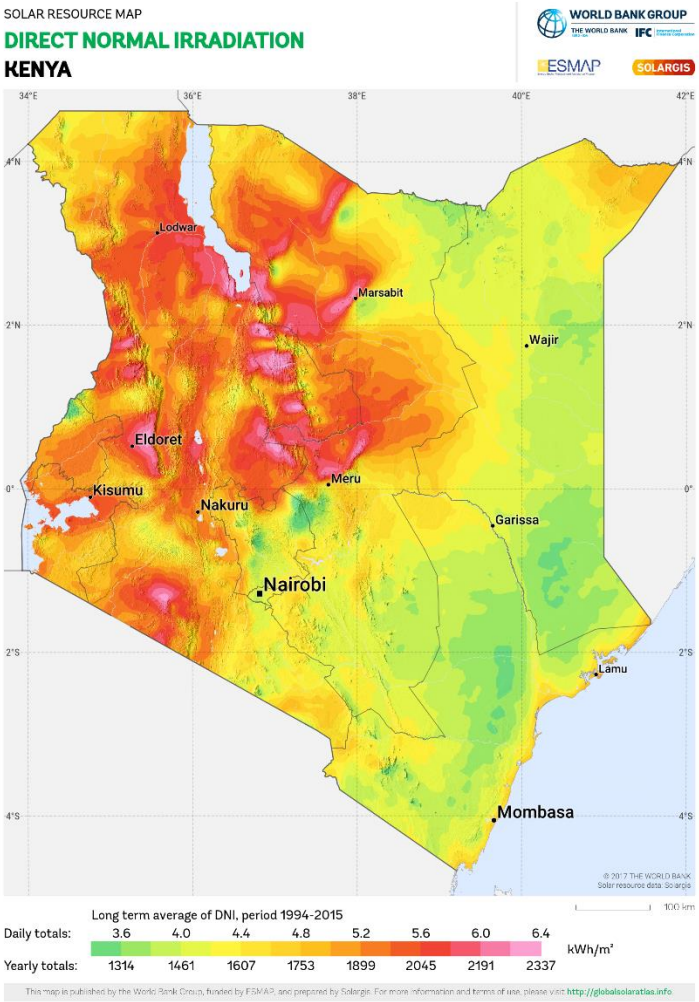

Figure 1. Annual average DNI map for Kenya.

Kenya has a wide variety of climate zones with different insolation and rainfall rates. Once the annual average insolation for a particular location is determined from the DNI map, details about the seasonal variations of cloud fraction may be learned.

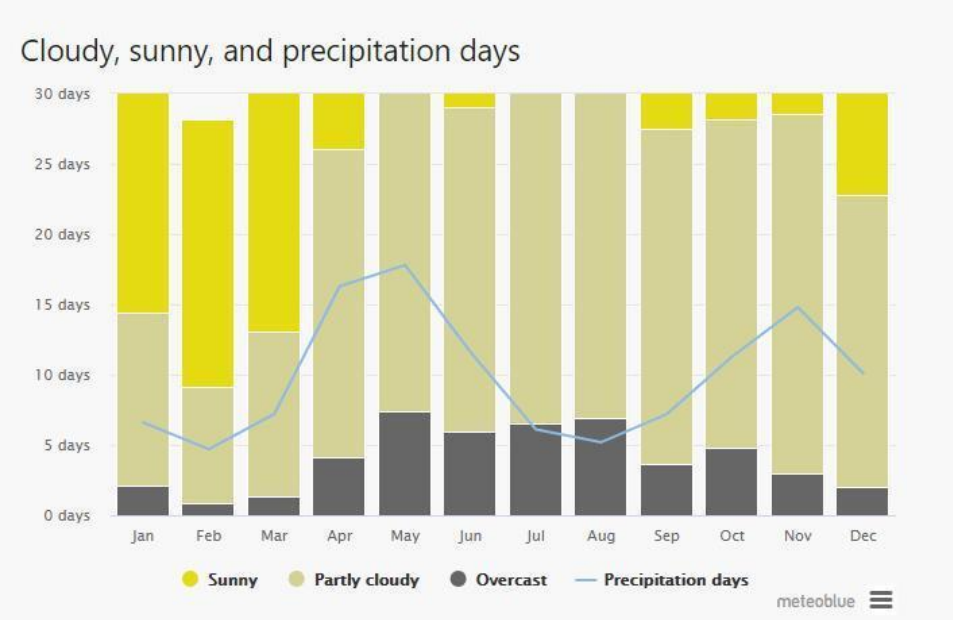

Figure 2. Seasonal variability for Nairobi. The partly cloudy data are for values of 20 to 80% cloud fraction.

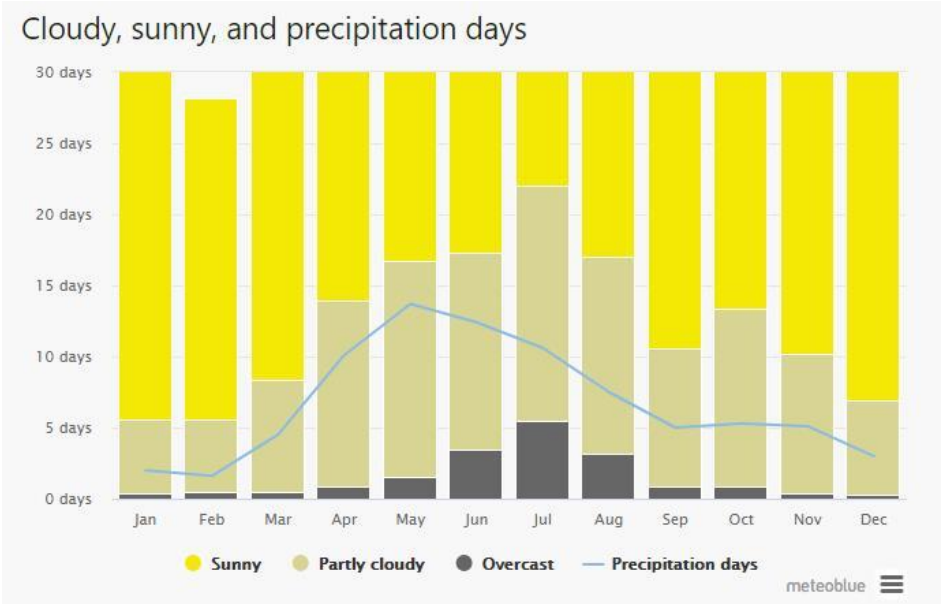

Figure 3. Seasonal variability for Kakuma. The partly cloudy data are for values of 20 to 80% cloud fraction.

These data are readily available nowadays, and they should be used in planning the time of year in which to start a demonstration project.

References:

https://solargis.com/maps-and-gis-data/overview

https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/kakuma_kenya_195197