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Rural electrification planning for Senegal using Energy Access Explorer

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1. Context

- Universal Electricity Access Program by 2035
- Electrification rate of Senegal (2022) = **60**%
- **PUELEC** = sub-program of Universal Electricity Access Program and is an emergency rural electrification program for 7924 localities with differents technologies planed (grid extension + mini-grids PV)
- Indicators : population density, villages with existing minigrids, current national grid with distribution lines, GHI, healthcare facilities

2. Aim

- Identify the high priority rural areas for off-grids electrification (solar) and markets where potential customers may be located
- Mapping renewable energy potential with solar
- Visualise how electricity demand is distributed with priority accorded to health access

3. Methods & Scenarios

Scenarios were investigated to get priority areas for electrification with solar mini-grids by using the EAE platform.

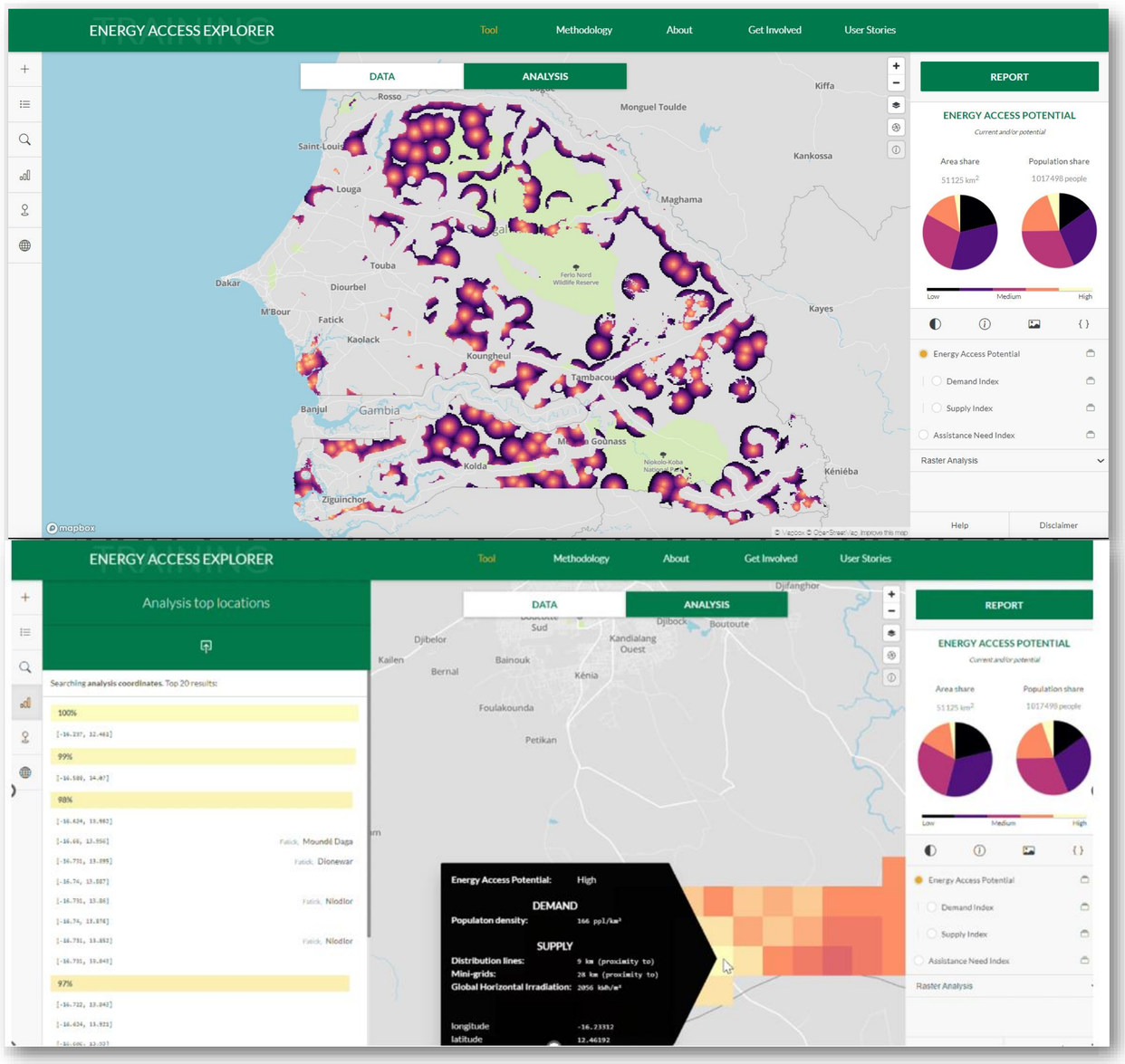
The scenarios combined 2 datasets in **demand** (demographics and social productives uses like healthcare facilities) and 3 datasets in **supply** (solar resources, grid network and existing mini-grids).

Running multicriterias analysis locates priority areas :

- with the highest population densities
- far from distribution lines (distant from the grid within 7 km)
- with high solar irradiation
- close to health care facilities
- not already involved in existing minigrids project

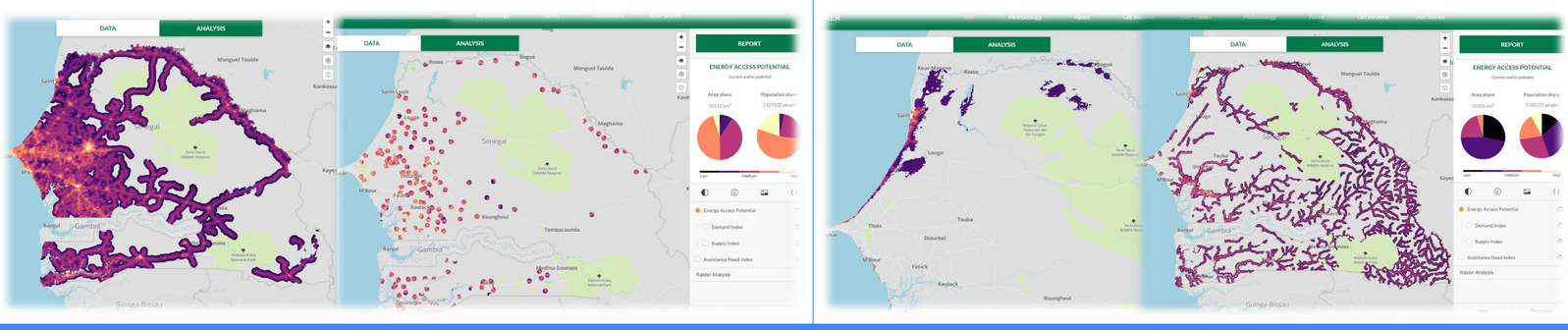
Data used	Description of data	Key criterias	Importance
Population density	People by *km² (2020)*	>= 5 ppl/km2	3/5
Distribution lines	Existing national grid (*in km*)	{max:700,min:7}	4/5
Global Horizontal Irradiance (GHI)	Solar irradiation (*in kWh/m²*)	{max: 2800, min: 2000}	5/5
Healthcare facilities	Location of healthcare facilities (*proximity in km*)	{max:15,min:0}	5/5
Mini-grids	Villages electrified with mini-grids (*proximity in km*)	{max:700,min:5}	5/5

4. Results



5. Policy insights, conclusions and future work

- **1 017 498 persons** including 6% living in areas with high energy access potential for solar minigrids
- **Grid network** : Extension of distribution lines (MV) to reach villages in proximity to the grid (< 7 km)
- Further analysis to indicate areas with high potential for : **wind capacity** (702 857 people) and **mini hydropower** (378 571 people) potential



6. References

[1] International Energy Agency, https://www.iea.org/countries/senegal

[2] The Humanitarian Data Exchange, https://data.humdata.org/

[3] Global Solar Atlas, https://globalsolaratlas.info

[4] ASER, https://www.aser.sn

[5] SENELEC, https://www.senelec.sn/

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