Geospatial Data and Mapping –
Advancing the Knowledge of Off-Grid Electrification in Myanmar

– *Paul Bertheau*

ACEF Forum Manila

June 7, 2018

Agenda

- About us
- Introduction: Why geospatial planning?
- Data requirements
- How to identify attractive sites?
- Results: Off-grid investment potential in Myanmar
- Conclusion

About us

Paul Bertheau

On behalf of

Catherina Cader
Geo-spatial planning expert
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Overview

- Not-for-profit research institute
- 100% owned by Reiner Lemoine Stiftung (RLS)
- Based in Berlin, established in 2010
- Managing director: Dr. Kathrin Goldammer
- 25 research assistants + students
- Member of e.g. ARE, SDSN

Reiner Lemoine
Founder of the Reiner Lemoine Foundation

Mission

Scientific research for an energy transition towards 100 % renewable energies

http://rl-institut.de/en

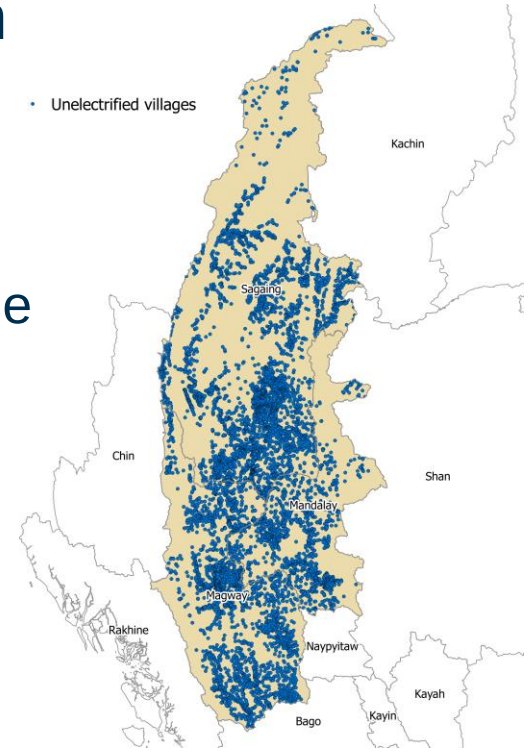
Introduction: Why geospatial planning?

- Electrification planning is a spatial task:
  - Where is it required?
  - Where is the closest power line?
  - What is the distance to the next village, to the grid?
  - Which resources are available in one location?
  - Where to extend the grid and where to construct mini-grids or rely on solar-home-systems?

Status of village electrification

- Village electrification remains a challenge in Magway, Mandalay and Sagaing Region
  - Especially Sagaing has a large number unelectrified villages
  - Mandalay has the highest electrification ratio of the three states

State/Region	Number of villages	Villages unelectrified	% Villages unelectrified	% of Total unelectrified villages
Magway	4,294	2,380	55%	31%
Mandalay	4,834	1,418	29%	19%
Sagaing	5,694	3,762	66%	50%
Total	14,822	7,560	100%	100%



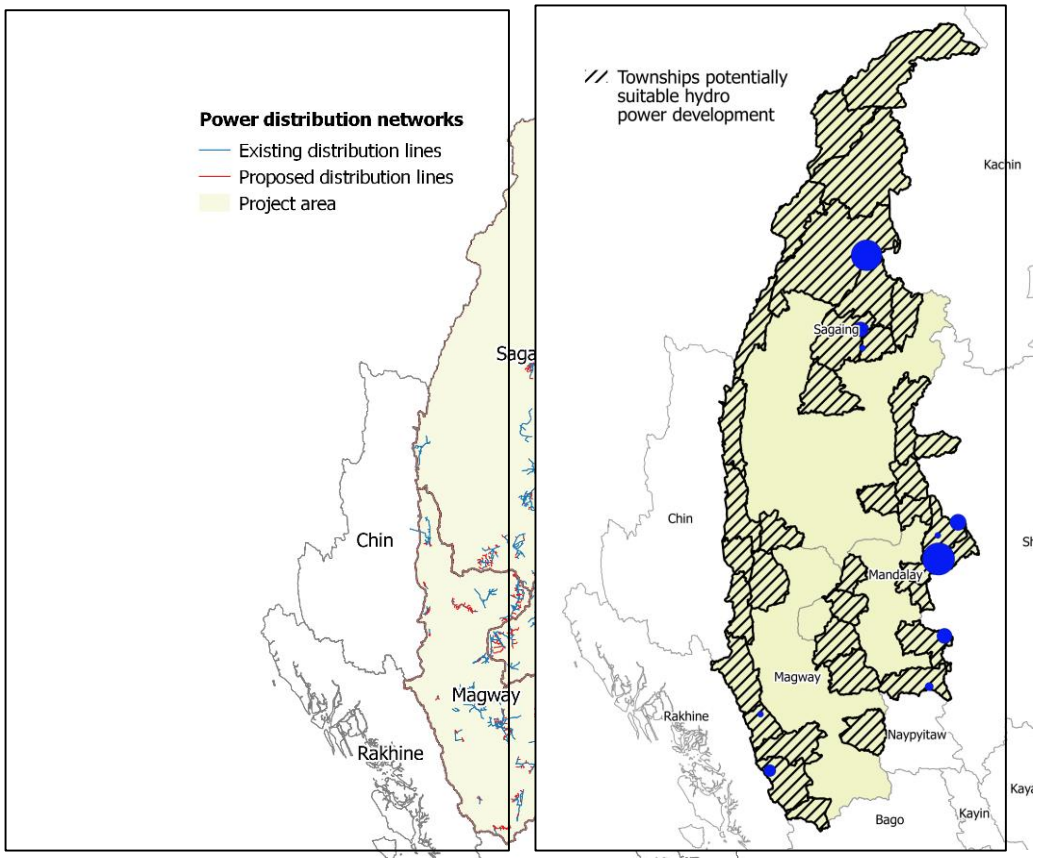
How to identify attractive sites for mini-grids?

- Off-grid investments in the mini-grid sector are preferable in location which has a renewable energy potential and

  - is located in a sufficient distance to the existing and planned distribution grid,
  - the population is willing to meet their electricity need by a mini-grid,
  - has a demand large enough to create a sustainable revenue stream by selling the electricity,
  - is accessible for allowing the construction and maintenance of the system (next main road is in close proxy).

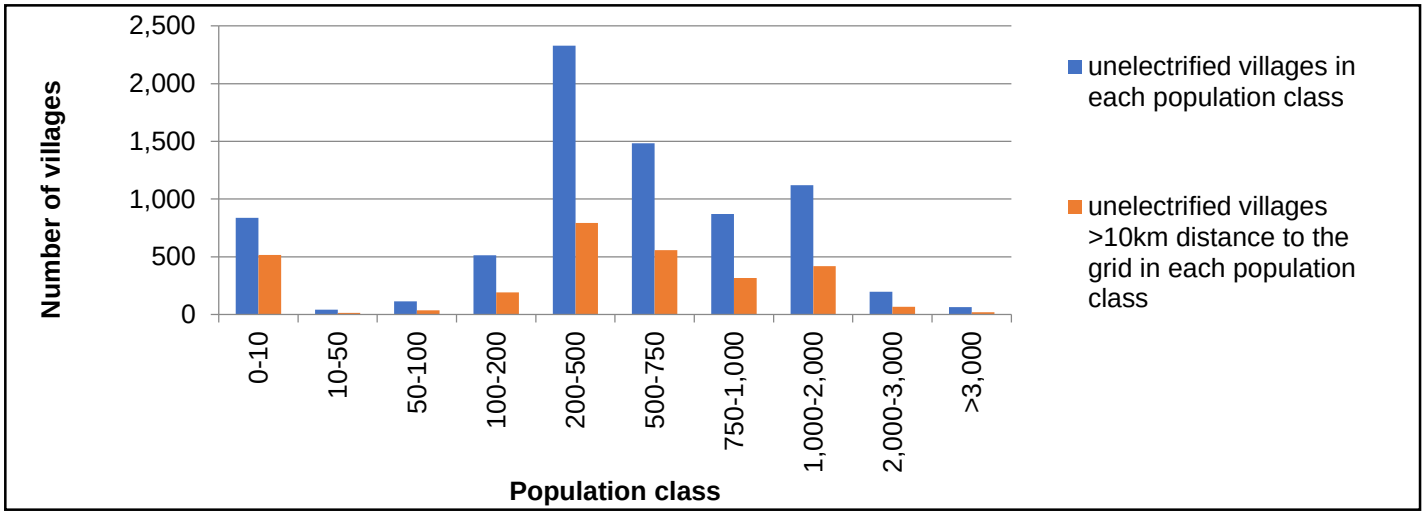
Overlay of several information layer

- Demographics
  - Villages
  - Cluster
- Infrastructure
  - Power lines
  - Diesel generators
  - Mini-grids
  - Potential hydro sites
- Resources
  - Hydro
  - Solar
  - Biomass
- Basemaps



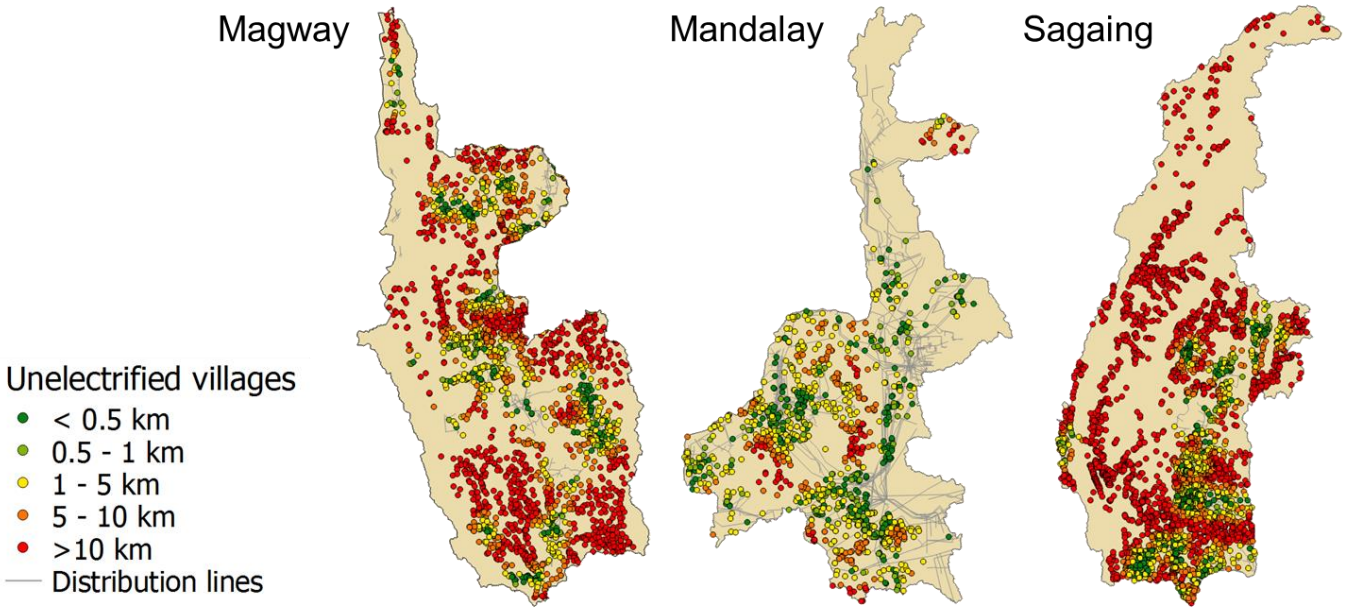
Results: Off-grid investment potential in Myanmar

- Considering village locations, population numbers, existing infrastructure and resource potential it is found that many of the unelectrified villages are located in a distance more than 10 km to the grid and have a sufficient estimated demand for electricity due to the population numbers.



Results: Off-grid investment potential in Myanmar

- Especially in the Magway and Sagaing a large number of unelectrified villages is located in a distance of more than 10 km to the next distribution line.
- Mandalay has the most dense distribution infrastructure network, reducing the potential for off-grid electrification.



Showcase of tool

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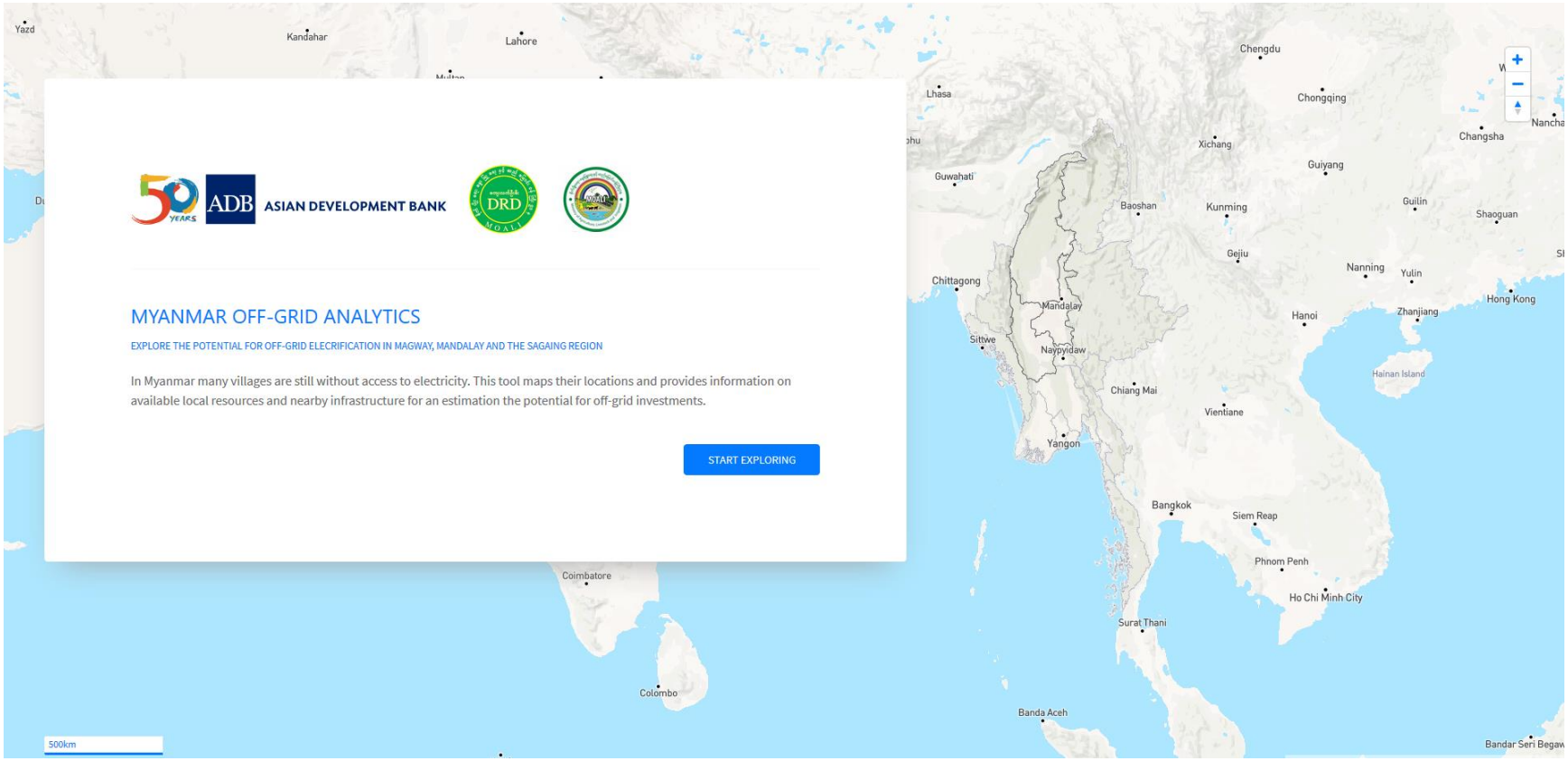
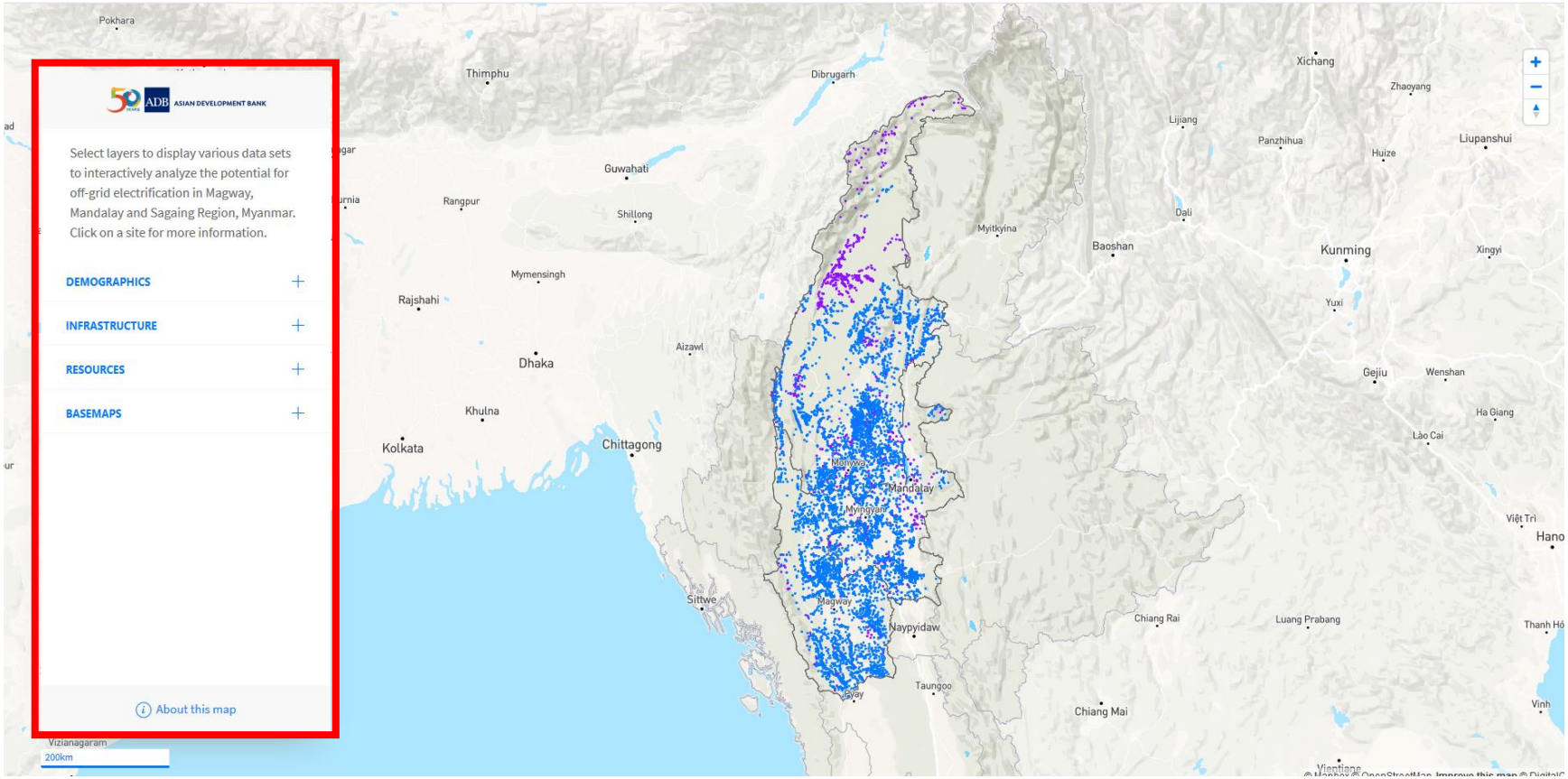
http://adb-myanmar.integration.org/

Landing page

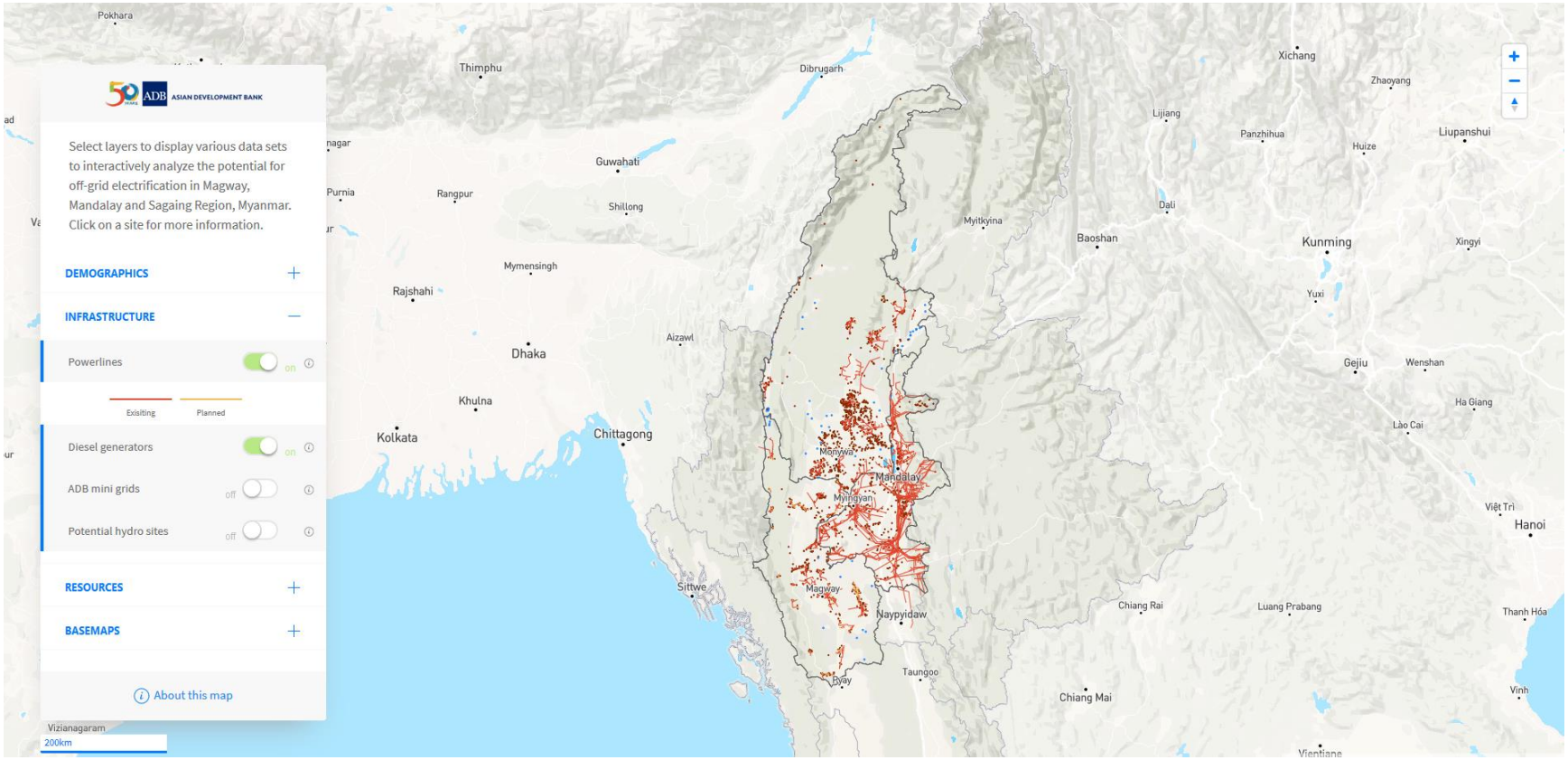


Overview

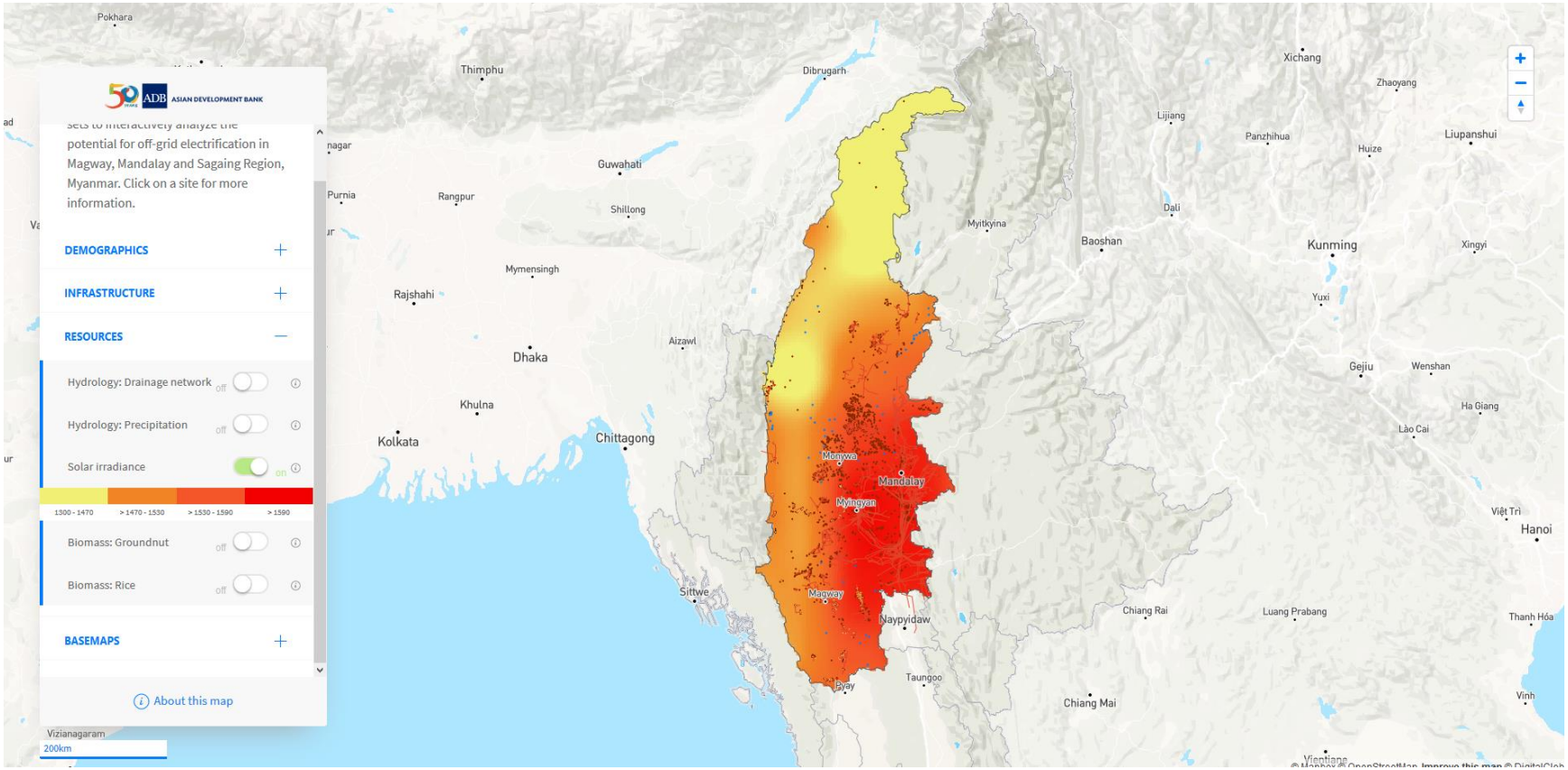

ADB ASIAN DEVELOPMENT BANK
Select layers to display various data sets to interactively analyze the potential for off-grid electrification in Magway, Mandalay and Sagaing Region, Myanmar. Click on a site for more information.
DEMOGRAPHICS
INFRASTRUCTURE
RESOURCES
BASEMAPS
About this map
Pokhara
Thimphu
Dibrugarh
Guwahati
Rangpur
Shillong
Mymensingh
Rajshahi
Dhaka
Aizawl
Khulna
Kolkata
Chittagong
Sittwe
Myitkyina
Xichang
Zhaoyang
Lijiang
Panzhihua
Liupanshui
Huize
Dali
Baoshan
Kunming
Xingyi
Yuxi
Gejiu
Wenshan
Ha Giang
Lào Cai
Việt Trì
Hano
Monywa
Mandalay
Myingyan
Magway
Naypyidaw
Taungoo
Chiang Rai
Luang Prabang
Thanh Hó
Chiang Mai
Vinh
Vizianagaram
200km

Demographics

Infrastructure



Resources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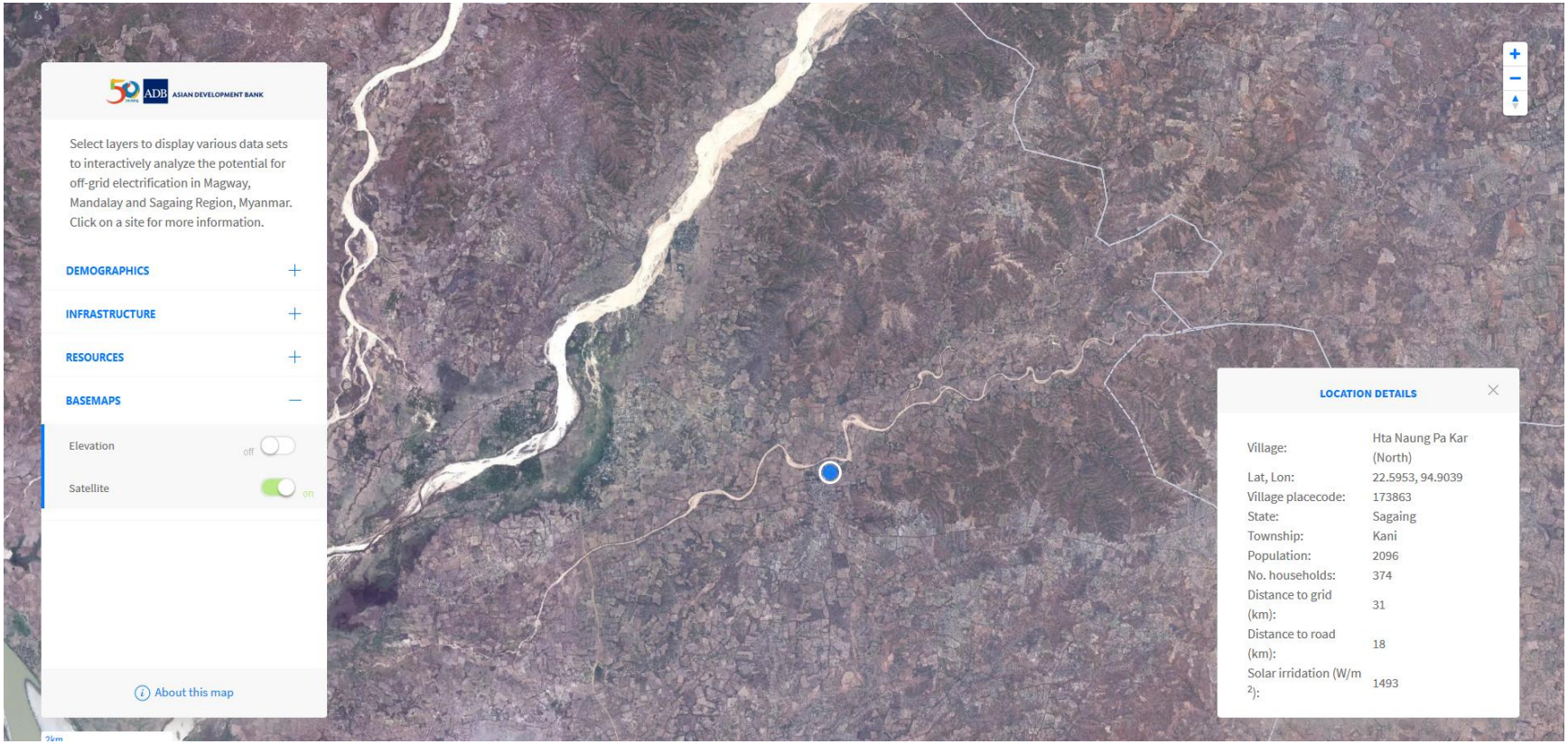
potential for off-grid electrification in Magway, Mandalay and Sagaing Region, Myanmar. Click on a site for more information.
DEMOGRAPHICS
INFRASTRUCTURE
RESOURCES
Hydrology: Drainage network
Hydrology: Precipitation
Solar irradiance
1300 - 1470
> 1470 - 1530
> 1530 - 1590
> 1590
Biomass: Groundnut
Biomass: Rice
BASEMAPS
About this map
Vizianagaram
200km
Pokhara
Thimphu
Dibrugarh
Guwahati
Purnia
Rangpur
Shillong
Mymensingh
Rajshahi
Dhaka
Aizawl
Khulna
Kolkata
Chittagong
Sittwe
Myitkyina
Xichang
Zhaoyang
Lijiang
Panzhihua
Liupanshui
Huize
Dali
Baoshan
Kunming
Xingyi
Yuxi
Gejiu
Wenshan
Ha Giang
Lào Cai
Việt Trì
Hanoi
Monywa
Mandalay
Myingyan
Magway
Naypyidaw
Pyay
Taungoo
Chiang Rai
Luang Prabang
Thanh Hóa
Chiang Mai
Vinh
Vientiane

Zoom to relevant place and derive info



Thank you very much for your attention!

Contact us for…

… Partnerships
… Research cooperations
… Joint project proposals

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