



Energy Justice and Off-grid Energy Systems: Comparing DR Congo, Arctic, Nepal and Vietnam



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Technology innovation is shifting grid futures

Policy and business models catch up to technology enabling a more integrated grid that features

- Smart solar and solar + battery systems
- Smart Grid and Digital Technologies
- Customers empowered to manage their consumption and to sell power alongside traditional grid assets.
- What else?

De-centralization with more Integrated Grids

Growing penetration of solar, storage, EV, efficiency, demand response technology

- Pricing Reform
- Business Models
- Regulatory Models
- Consumer behaviour

Status quo policies and business models:

- Non exporting solar and solar + battery systems
- Grid defection as solar + battery systems become more economic
- Overbuilt grid with sunk capital
- Stranded assets on both sides of the meter

De-centralization with “Grid Defection”



Case Selection and Methodology

Off-grid context 1

Serving the grid

- DR Congo
 - Only 17% access
 - Qualitative only
 - Delivering Hydro energy
 - Inga dams
- Russian Arctic
 - Only 15% access
 - Qualitative only
 - Delivering Coal energy
 - Barentsburg

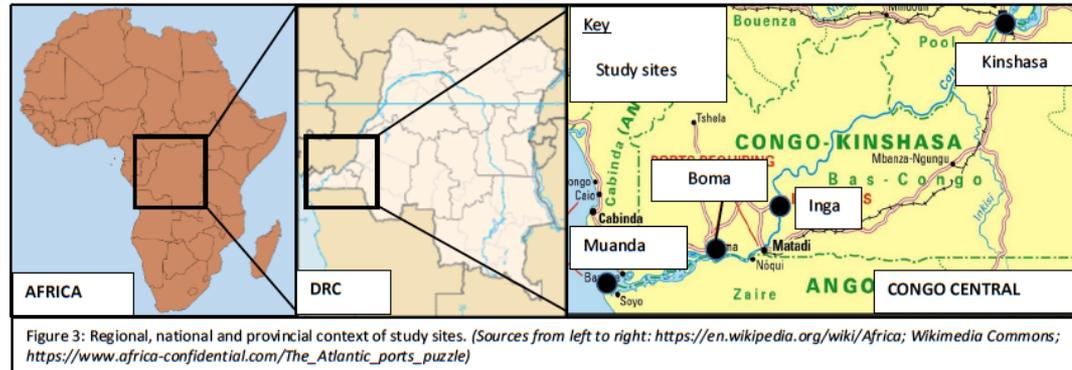
Off-grid context 2

Living off-grid

- Nepal
 - 75% access
 - Quantitative and Qualitative
 - Using Biogas
 - Several provinces
- Vietnam
 - 70% access
 - Quantitative and Qualitative
 - Using Biogas
 - West Hochiminh City

Serving the Grid – Congo and Arctic

Disrupting Livelihoods



- Inga hydro project biggest in the world
- Inga 1 and Inga 2 in 1972 and 1982 (Inga 3 soon)
 - Altered landscape dramatically
 - Large new settlements of workers
 - Le Plateau and the rest



Serving the Grid – Congo and Arctic

We were disturbed. We practice hunting and fishing. So, when the work (on the construction of the dams) was done here, hunting could not be done anymore because there were no more animals. After the explosives all the animals, most of them, left the land. And the fishing too. The way that our ancestors fished is no longer possible. Because when they made a channel in the river, they made the canal, really everything was disturbed. So fishing is not possible the way that our ancestors did it.

One can't leave the dam completely. Because now, the current development depends on electric energy. There is Africa. There is the DRC itself, which is waiting for electric energy. There is Africa. There is the world, even Europe. The World that needs electricity today. It's among the reasons that Inga 3, 4, 5, until 8, must be constructed.





Serving the Grid – Congo and Arctic

Donor logics embedded

- **Example: Barentsburg at Svalbard (*Vlakhov*)**
 - circa 500 inhabitants, mainly men (aged 25-40)
 - Town run by mining company Trust Arktikugol
 - Coal mine town since 1930 alongside other activities
- **Ethnography July-December 2016**
 - How to transition from coal mining dominated town?
 - Exploring concerns of residents at
 - Becoming tourism industry dominated
 - Need for more assistance in transition



Serving the Grid – Congo and Arctic

“My grandfather was a fisherman...(i)t was terrible, we got so lucky when (the company) arrived...(we) could go to and buy the fish”

“What are you going to do now (as mining has stopped)”

“I cant leave, my family is here. There is lots of money on taking people like you (me) on visits to the forest or the mainland...(t)hings arent so good at the minute”



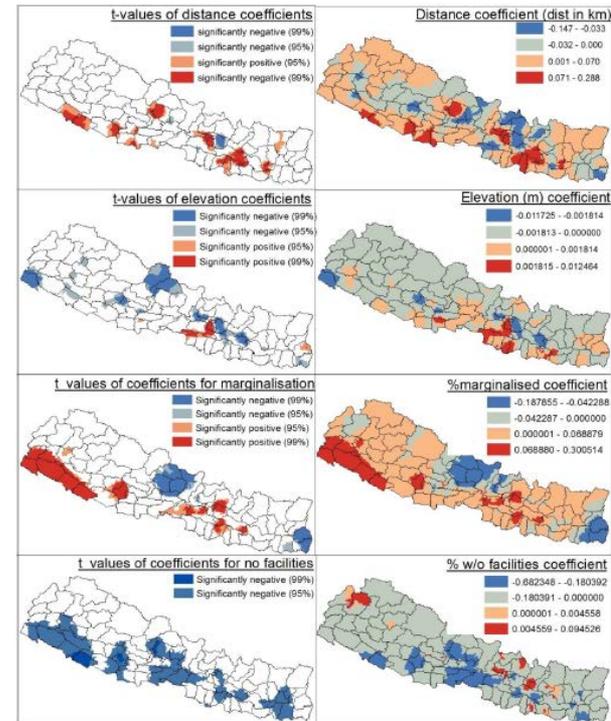
Living Off-Grid – Nepal and Vietnam

Spatial Inequalities heightened

Spatial inequalities in terms of

- 1) Topographic conditions
- 2) Social connectedness

Biogas subsidies policy targeted in most relevant areas where a national grid does not distinguish



Living Off-Grid – Nepal and Vietnam

Empowerment and the end user

- *Male (via translator):* They said, uh: we are not trained; we are only trained how to operate, so whenever we need, we have to call for help.
- *Female (via translator):* **She said: I know how to open and close the valve.**
- *Researcher:* Do they find that a problem, or that's ok?
- *Male (via translator):* They said, it's not a good thing that we don't know about how to handle all the things, because if we knew about that, we wouldn't have to wait for the company and for another person... We could manage ourselves. And it would be more safe, easier and faster way.
- *"This is our property, and we should have to save it, and we [these twelve households] should have to operate it, [but] some... one or two members are neglecting the rules... [I am] very happy in using this, and all the households should take responsibilities."*



Figure 10: Community members in Mahuwa in discussion around a community biogas digester

Living Off-Grid – Nepal and Vietnam

Company exploitation of end users?

- 70% live in rural areas, earning living off agriculture
 - Most research conducted around Hanoi, we focus in the regions surrounding HochiMinh City
- Company monopoly around SNV

Table 1 Outputs Biogas Programme Vietnam period 2003 to 2007

| | |
|-------------------------------|---|
| Constructed biogas plants | 27,000 |
| Number of Provinces | 20 |
| Savings on workload/household | 1 to 1.5 hours per day |
| Savings of fuel/household | 5 Euro per month |
| Rural job creation for masons | 300,000 labour days |
| Income masons | 2.5 Euro per day |
| Turnover labour costs | 750,000 Euro |
| Sanitation | 40% have now toilets attached to digester |



Figure 4 The biogas plants provide houses with improved energy services (photo: Biogas Programme Vietnam)

Living Off-Grid – Nepal and Vietnam

New practices and responsibilities improving livelihoods

“Before the advent of clean biogas, cooking was an uneasy and hazardous job for me. My kitchen would become smoky with black particles coming out from the muddy stove from fuel wood burning. The black ash would make me cough the whole day and cause soreness in my eyes”

“I have built a number of biogas plants for SNV, which imparted me training on biogas plant construction. Now, I am happy that people are calling on my cellphone and asking me build biogas plants for them. I will continue to build biogas plants for private customers as long as there is demand”



Conclusion: *New geographies of responsibility*

- Energy justice is currently framed as;
 - Increasing the rights of the *individual* [cosmopolitan justice]
 - Increasing the responsibility taken by *institutions* [procedural justice]
- BUT changing energy trajectories and grid dynamics mean...
 - Distributional: proximity maybe not a burden, but a potential benefit
 - Recognition: not simply where rights are not upheld – but also responsibilities
 - Procedural: where a move from institutional to individual ownership
- Increasing the responsibility of individuals [citizenship]
- Increasing the rights of institutions [government and law]

Oh yes...and see my new book 😊

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