

Energy for what? A look at users, uses, needs and solutions

Sini Numminen



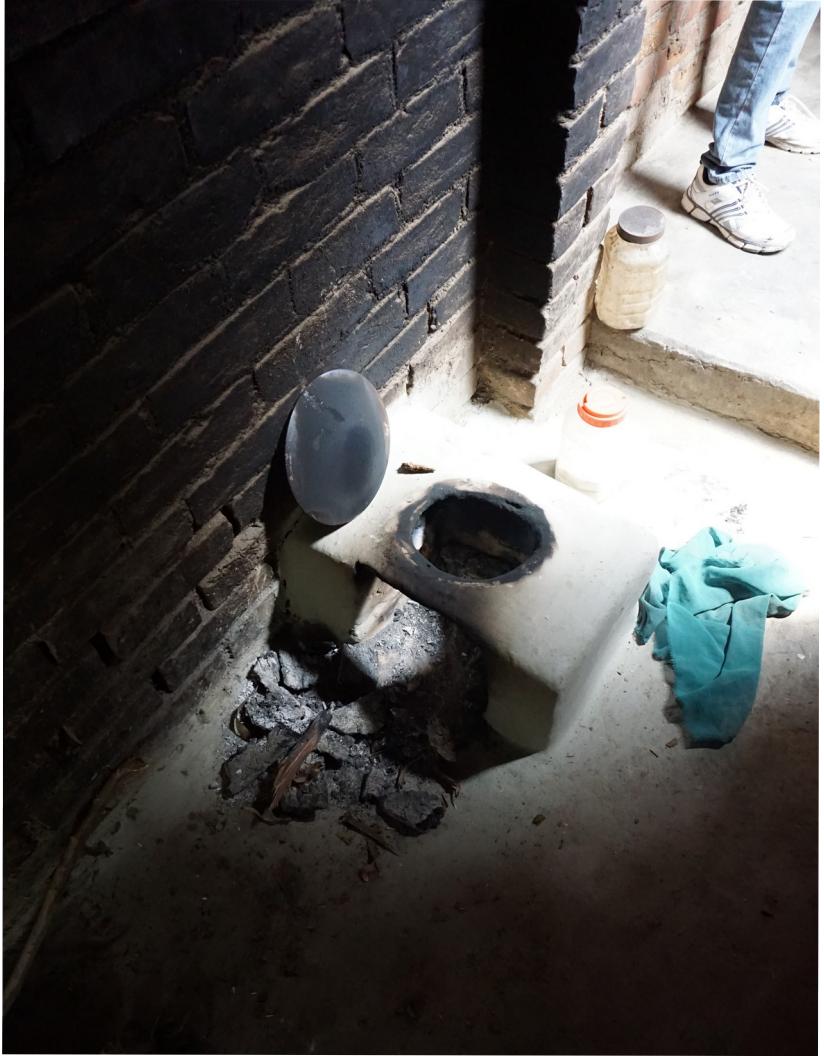
**Aalto
Sustainability
Hub**

www.sininumminen.fi





Photo: Sini Numminen, 2016 (Uttar Pradesh, India)



Photos: Sini Numminen, 2016 (Uttar Pradesh, India)

Access to clean energy?

- **"Access to clean cooking facilities** means access to (and primary use of) modern fuels and technologies, including natural gas, liquefied petroleum gas (LPG), **electricity**, bioethanol and biogas, or **improved biomass cookstoves (ICS)** which deliver significant improvements compared with basic biomass cookstoves and three-stone fires traditionally used in some developing countries." [1]

Table of Contents	
Preface
Acknowledgement
Clean Cooking Systems – A Note
1 Steel Mould for KVIC Biogas Plant
2 Vaayu – A Domestic Biogas Unit
3 Greenway Grameen Initiative of Smart Stoves
4 Efficient Biomass Chulha for Cooking
5 Himalayan Rocket Stove
6 Biogas based Cooking Grid

[2]



! "Extensive analysis conducted --- showed that such programmes had limited success (IEA, 2017a). Improvements in pollutant levels from improved biomass cookstoves were often overstated, with virtually no biomass cookstoves on the market meeting WHO standards for exposure to household air pollution." [1]

Source:

[1] IEA, 'Africa Energy Outlook 2019', International Energy Agency, 2019. Accessed: Jan. 05, 2020. [Online]. Available: <https://webstore.iea.org/africa-energy-outlook-2019>.

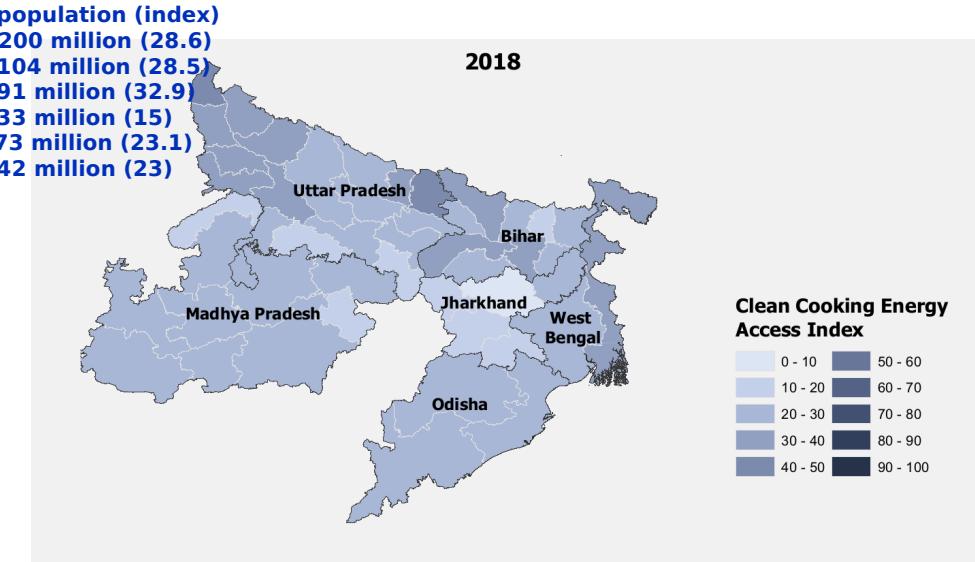
[2] CLEAN, 'India Clean Cooking Forum 2018: Strategizing Renewable Energy for Cooking', The Clean Energy Access Network, New Delhi, India, 2018. Accessed: Nov. 23.2020. [Online]. Available: <https://thecleannetwork.org/pdf/Cookstove-success-stories-in-India-1.pdf>

- India: 680 million people (57%). (WEO, 2018)
- Globally: 2.7 billion people (40%). (UN, 2020)



Photo: Sini Numminen, 2018 (Jharkhand, India)

State
Uttar Pradesh
Bihar
West Bengal
Jharkhand
Madhya Pradesh
Odisha

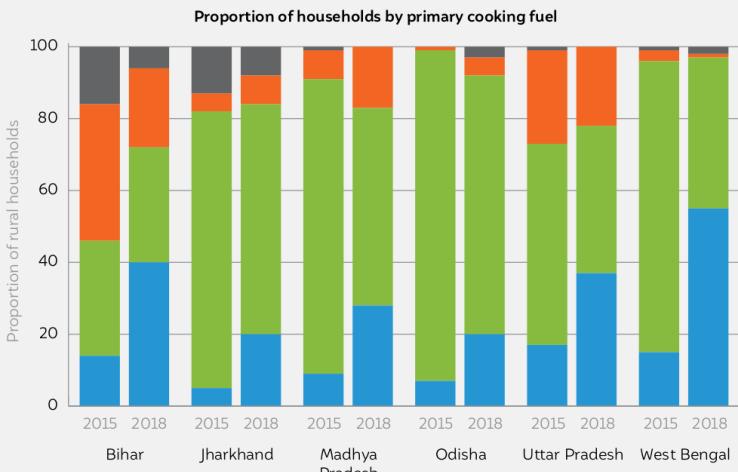


Note: The index is a composite score with range from 0-100, representing the overall clean cooking energy access situation in the region by considering the proportion of households in each tier of clean cooking energy access. Zero means all households are in Tier 0, and 100 means all households are in Tier 3.

TABLE 2: Multidimensional, multi-tier framework to assess cooking energy access

	Tier 0	Tier 1	Tier 2	Tier 3
Health and safety	Only traditional fuels are used (firewood, dung-cakes, agricultural residue)	A mix of traditional fuel and BLEN (biogas, LPG, electric, natural gas) is used	Only source of cooking fuel is BLEN	
Availability	Cooking less because of lack of availability	Unsatisfied with availability	Neutral to availability	Satisfied with availability
Quality	Quality of cooking is not adequate		Quality of cooking is adequate	
Affordability	Not affordable		Affordable	
Convenience	Both difficult to use and time-consuming	Either difficult to use or time-consuming	Neither difficult nor time-consuming	

FIGURE 39: A significant movement of households from biomass to LPG has occurred, but disparities across states remain



Source: CEEW analysis, 2018

“In India, the device most commonly used to burn traditional biomass is still the traditional chulha. The penetration and use of improved cookstoves is very low.”

Source: A. Jain, S. Tripathi, S. Mani, S. Patnaik, T. Shahidi, and K. Ganesan, ‘Access to Clean Cooking Energy and Electricity. Survey of States 2018’, Council on Energy, Environment and Water (CEEW), New Delhi, India, CEEW Report, Nov. 2018. Accessed: Nov. 22, 2018. [Online]. Available: <https://www.ceew.in/publications/access-clean-cooking-energy-and-electricity>.

Summary

- **Look at people, and how they use energy and why**
- **Don't omit local cultural and social aspects and realities, otherwise your project will fail [1] [2]. Don't expect too immediate changes. Involve all stakeholders (including users) in the design process.**
- **Just delivering electricity access (alone) will not solve social or economic problems. Holistic development plans needed. [3] [4]**
- **Poverty is overarching and also affects energy and fuel choices and creates and shapes energy practices**
- **Energy access is qualitative [5]**

Sources:

[1] M. Khandelwal et al., 'Why Have Improved Cook-Stove Initiatives in India Failed?', *World Development*, vol. 92, pp. 13–27, Apr. 2017, doi: 10.1016/j.worlddev.2016.11.006.

[2] S. Abdelhour, C. Pemberton-Pigott, and D. Deichmann, 'Clean cooking interventions: Towards user-centred contexts of use design', *Energy Res. Soc. Sci.*, vol. 70, p. 101758, Dec. 2020, doi: 10.1016/j.erss.2020.101758.

[3] S. Alexander, 'Energy Solutions Shouldn't Just Tick Boxes, They Should Transform Communities', *Next billion. An initiative of the William Davidson Institute at the University of Michigan*, Jun. 29, 2017. <https://nextbillion.net/energy-solutions-shouldnt-just-tick-boxes-they-should-transform-communities/> (accessed 4. Jan. 2018) (accessed Jan. 04, 2018).

[4] P. Bayer, R. Kennedy, J. Yang, and J. Urpelainen, 'The need for impact evaluation in electricity access research', *Energy Policy*, vol. 137, p. 111099, Feb. 2020, doi: 10.1016/j.enpol.2019.111099.

[5] S. Pelz, S. Pachauri, and S. Groh, 'A critical review of modern approaches for multidimensional energy poverty measurement', *Wiley Interdisciplinary Reviews: Energy and Environment*, 2018, doi: 10.1002/wene.304.

Q&A



www.sininumminen.fi
sini.numminen@aalto.fi