



The Leverhulme Trust

Making Solar Markets in Rural India Light, Technology and Knowledge at the 'Bottom of the Pyramid'

Non Technical Briefing Note

Jamie Cross
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This briefing note provides non-technical background information on a 3 year research project funded by the UK's Leverhulme Trust & the University of Edinburgh.



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Dr Jamie Cross

Jamie Cross is a Lecturer in the Department of Social Anthropology at the University of Edinburgh. He received a PhD in Social Anthropology from the University of Sussex in 2008. He has over ten years of ethnographic fieldwork experience in South Asia focused on the social and economic impact of development policy. He has taught at Cornell University, the National University of Ireland, and the University of London. He is the author of 'Economies of Anticipation: Dreams, Desire and Capitalism in India' (Pluto Press, forthcoming 2013)

The University of Edinburgh

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The Leverhulme Trust

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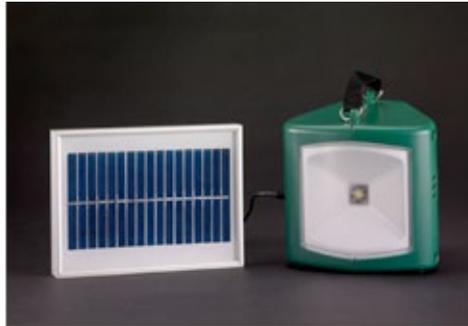
Rationale

At the beginning of the 21st century the solar powered lantern has become an iconic 'bottom of the pyramid' technology.

There is a surge of investment in the production, sale and distribution of low cost, LED based lighting applications for solar PV for people living off the grid in Africa and Asia.

Ultra-affordable solar lighting products are credited with the power to transform lives and livelihoods *and* with the capacity to deliver commercial value for businesses.

"The 100th Object"
Solar Powered Lamp and Charger
from the British Museum's 2011 collection
'A History of the World in 100 objects'



Markets for ultra-affordable goods and services at the bottom of the economic pyramid do not emerge: they are made.

To think about the work that goes into making markets is also to engage with the social relationships that connect bottom of the pyramid approaches to development outcomes.

As well as informing policy makers and energy researchers this project will contribute to academic thinking in the fields of economic anthropology and science and technology studies. The project brings together theoretical approaches to the study of markets and technology as 'socio-technical systems', and to the study of value as creative or practical action.^[2]

[2] For more technical detail on the academic content please refer to the project website: www.solarassemblage.com

"An iconic technology"

There is increased recognition amongst UK development policy makers that the 'evidence base' on which bottom of the pyramid initiatives are evaluated must be expanded beyond the stories that organisations, businesses and social entrepreneurs tell of themselves.[1]

This project sets out to provide new insights and evidence about the development impact of bottom of the pyramid business models through a detailed case study of markets for solar lighting products in India.

Existing studies of portable solar lighting systems in South Asia have been primarily techno-economic in focus or driven by consumer psychology.

This project aims to build a deeper understanding of the social relationships that are being built into and shaped by BOP markets for solar technology, grounded in ethnographic research methods.



[1] Cross, J. 2012 'Increase the Evidence Base at the Bottom of the Pyramid' www.businessfightspoverty.com

Aims & Methods

Over a 3 year period (2012-2014) this project will:

- 1) Develop a detailed portrait of the diverse actors involved in BOP markets for solar powered lighting in India (from technology importers, original equipment manufacturers, retailers, direct distributors and end users to development donor agencies, international financial organisations, and banks).
- 2) Develop a social history of the solar lantern in South Asia that traces the impact of state and non-state procurement policies, regulatory and institutional frameworks on design processes and practices, and that explores the role of users in design.
- 3) Examine the ideas and assumptions about the capacities and behaviours of poor users that are being inscribed into the design of solar lighting technologies.
- 4) Account for the ways that relationships of gender, kinship and caste are incorporated into and transformed by market based approaches to the diffusion of solar technology.
- 5) Explore the social and symbolic meanings of light in Hindu, Muslim and Christian South Asia and how they shaping the attitudes and preferences of users.

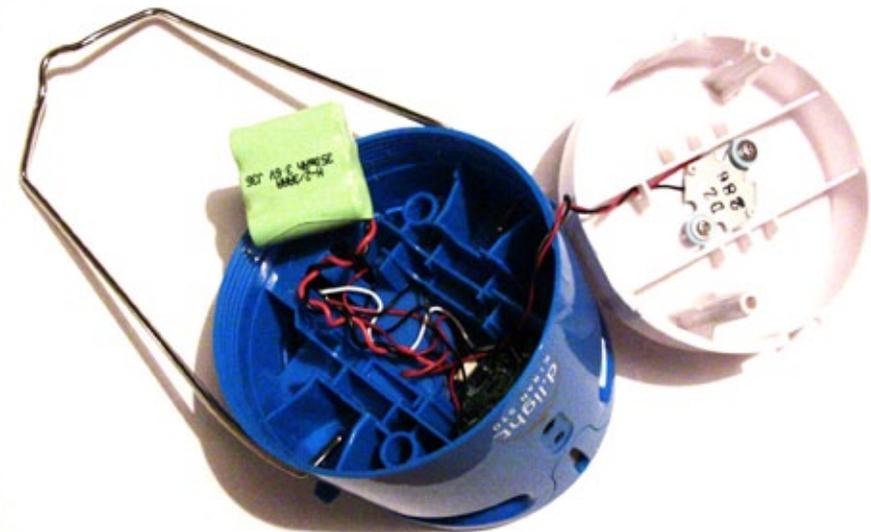
This project takes a social anthropological approach to research, using ethnography to build extended case studies that track the changing activities and points of view of multiple actors.

To date the project has involved contextual interviews with engineers, designers and manufacturers in India. Between 2012 and 2013 comparative field based research in India will be carried out at sites in Orissa and Uttar Pradesh.

This project sets out to directly engage with stakeholders in India through interviews and seminars.

This provides opportunities for stakeholders to inform the project's development, learn from its findings and for the project to provide critical input into continued efforts to expand markets for solar lighting applications in South Asia.

“An ethnographic approach”



Emerging Outcomes

“Connective Politics”

The energy choices made by off the grid consumers in rural India are being shaped by struggles for political recognition and connection to the state as much as by decisions about economic cost and technical efficiency.

Reports from practitioners, NGOs and energy researchers in India suggests that users continues to see solar photovoltaic lighting systems as a ‘transition technology’ (that prefaces grid connectivity) rather than a ‘leapfrog technology’ (that obviates the need for the grid).

Caste relationships and politics continue define social life in rural India. Attempts to increase the use of solar lanterns that ignore caste can reproduce historic inequalities.

For example, when the location of a decentralised infrastructure for off-grid lighting (e.g. a village level charging station) maps directly onto the caste based organisation of village space it can re-inforce and perpetuate patterns of segregation and exclusion.

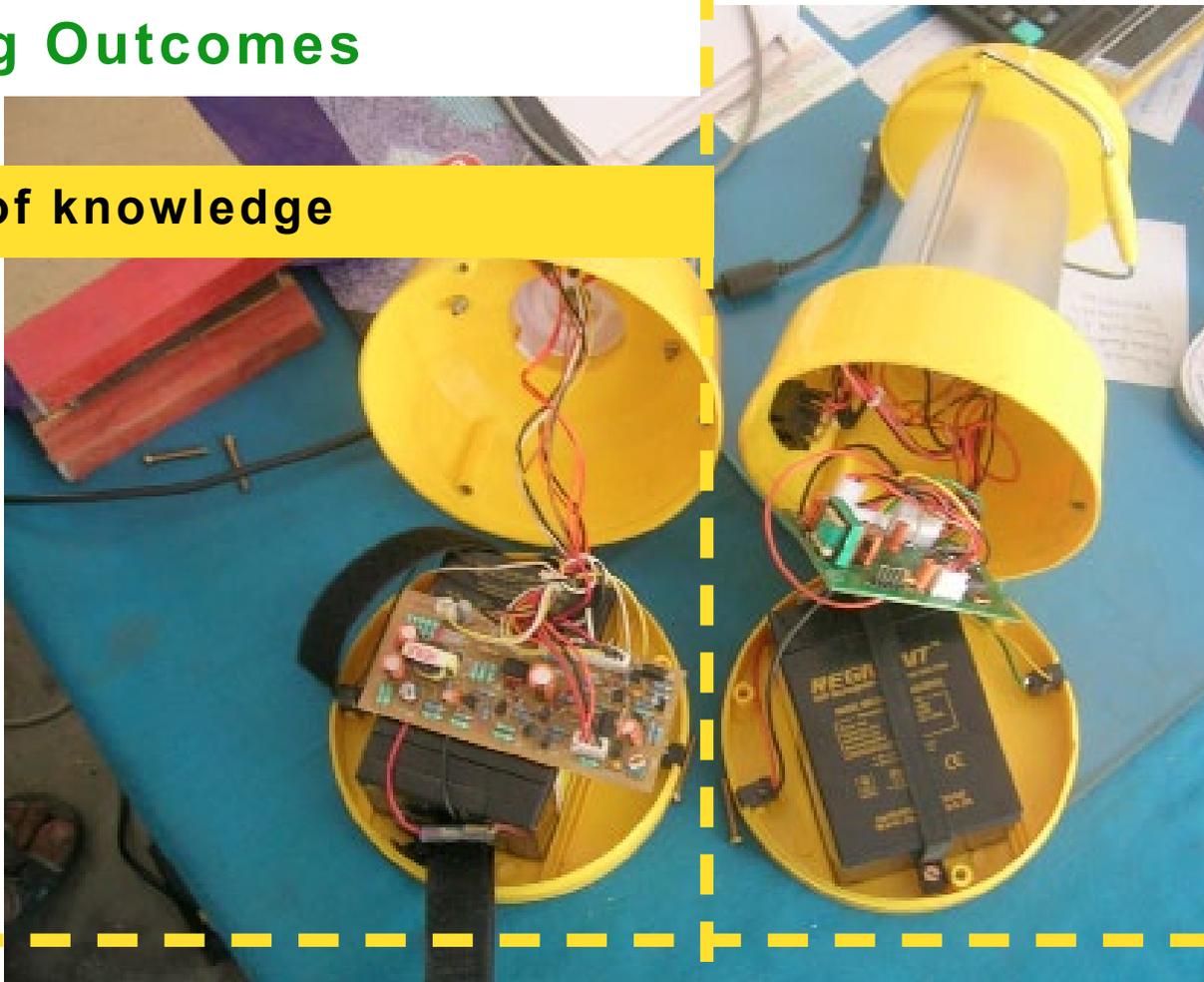
Across South Asia the conspicuous consumption of consumer goods is associated with personal and collective ‘social mobility’.

Lighting technologies act as highly visible markers of status and prestige for rural consumers. In places where ‘low’ levels of lighting are associated with ‘low’ caste status consumers may reject affordable lighting products as curtailing rather than enabling their social mobility.



Emerging Outcomes

“Circuits of knowledge



Solar lantern circuit board based on 'through-hole technology' - India (circa 1998)



Hybrid solar lantern circuit board using surface mount technology - India (circa 2012)

The repair and maintenance of lighting technology is critical to its social impact.

“*Jugaad*” is a colloquial Hindi term for a ‘quick-fix’ or ‘work-around’. In North India the term is frequently used to describe innovative, improvised or ‘home-spun’ solutions or fixes to technical problems.

Closed lighting technologies that do not allow the user to open, re-engineer or re-work the system lock out local cultures of repair, maintenance and innovation.

Differences in design have power relations built into them.

The shift from ‘through-hole-technology’ to ‘surface mount technology’ in electronic circuit boards, for example, has significantly reduced the cost of solar lanterns, improving their affordability and performance. But the shift has excluded the user in new ways.

The repair of circuit boards built using surface mount technology requires skilled operators and specialised tools - dramatically reducing the ability of rural technicians to mend them.

Further information

In addition to a series of peer reviewed journal articles this project will culminate in a book, provisionally titled: *'Illuminating Markets: Solar Lighting at the Bottom of the Pyramid'*.



Further Reading

Cross, J. & Street, A. 2009
'Anthropology at the Bottom of the Pyramid' in Anthropology Today 25:4.

Available online:

<http://tinyurl.com/33vn2ky>

Cross, J. 2012 'History, Science and Society in the Solar Assemblage'
Presentation at the UK's Low Carbon Energy and Development Conference,

Available online:

<http://tinyurl.com/cgrl7ew>

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