Understanding the complexities between social, environmental & economic sustainability for user-centric infrastructure design solutions

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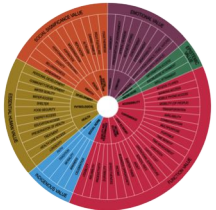

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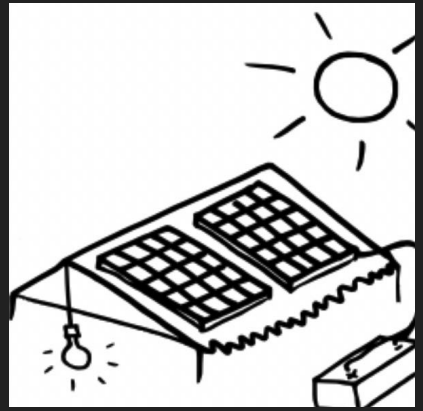
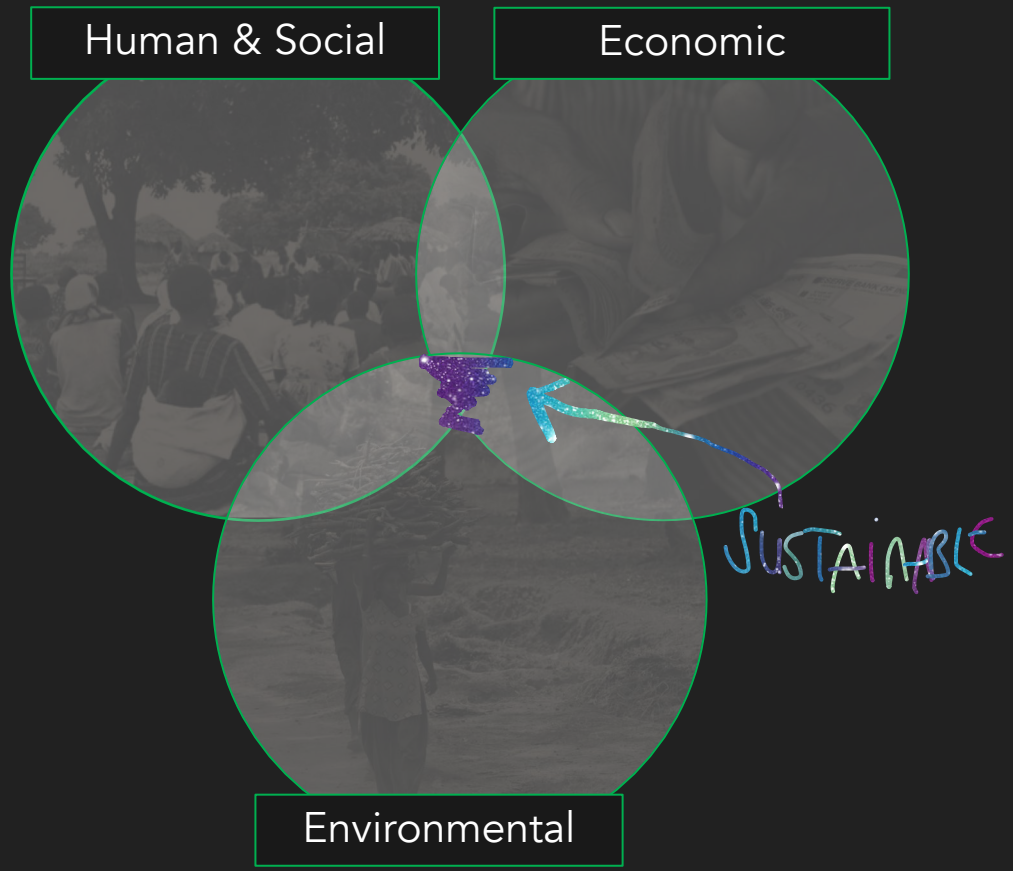
Infrastructure design solutions can take many forms but their global and local impact may vary.

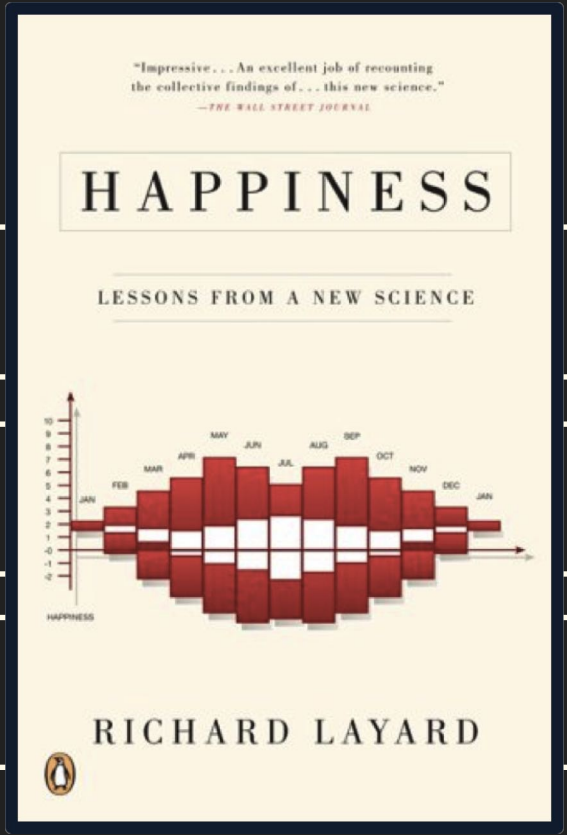


Global Sustainability dilemma: interrelationship



Local sustainability dilemma: complexity of design choices

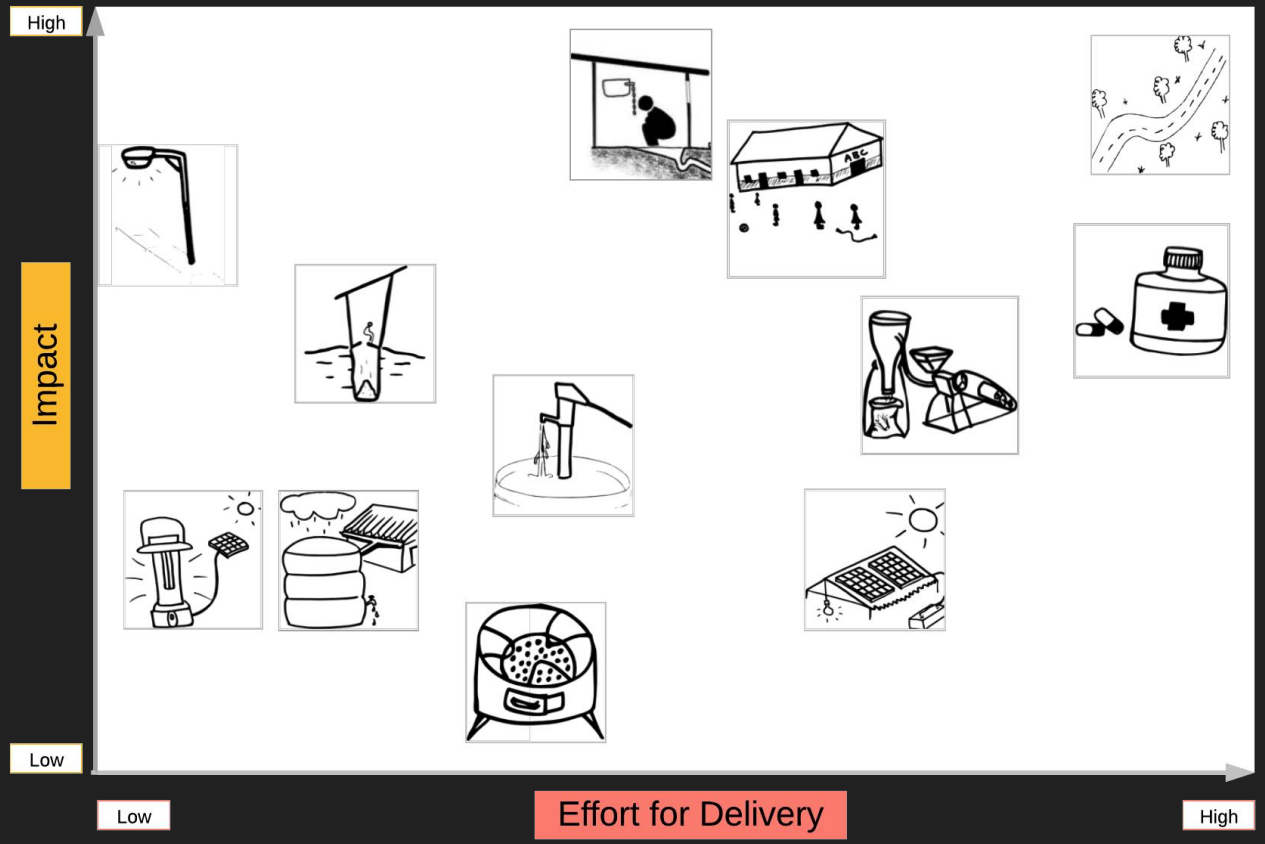
	Positively contribute to:	Negatively result in:
Human & Social	Greater awareness.	Less social interaction.
Financial	Better quality produce.	Inflexible expenditure.
Environmental	Reduced pollution.	Product waste & lack of recycling



Example: UPV data collection

I promise, if I had a stove my husband will be eating on time thus saving time on cooking. It helps me when there is no electricity to provide light. It may again help me on saving firewood because they stopped us from collecting firewood from the ‘Bwindi national park’. Then the stove helps me.

Infrastructure design solutions can take many forms but their global and local impact may vary.



The Effort of Infrastructures Design Solutions is a function of:

- Infrastructure requirement
- Skills
- Access

The Impact of Infrastructures Design Solutions can be defined as:

Human & Social

Economic

Environmental

Human & Social

- Inclusive (social justice & equitable)
- Improves wellbeing.
- Aligns with what is important.

Financial

- Employment (direct and indirect).
- Income generation (remains in community to international income).
- Job creation potential.

Image: Reuters. An attendant at a fuel station arranges Indian rupee notes in Kolkata, India, Aug. 16, 2018.

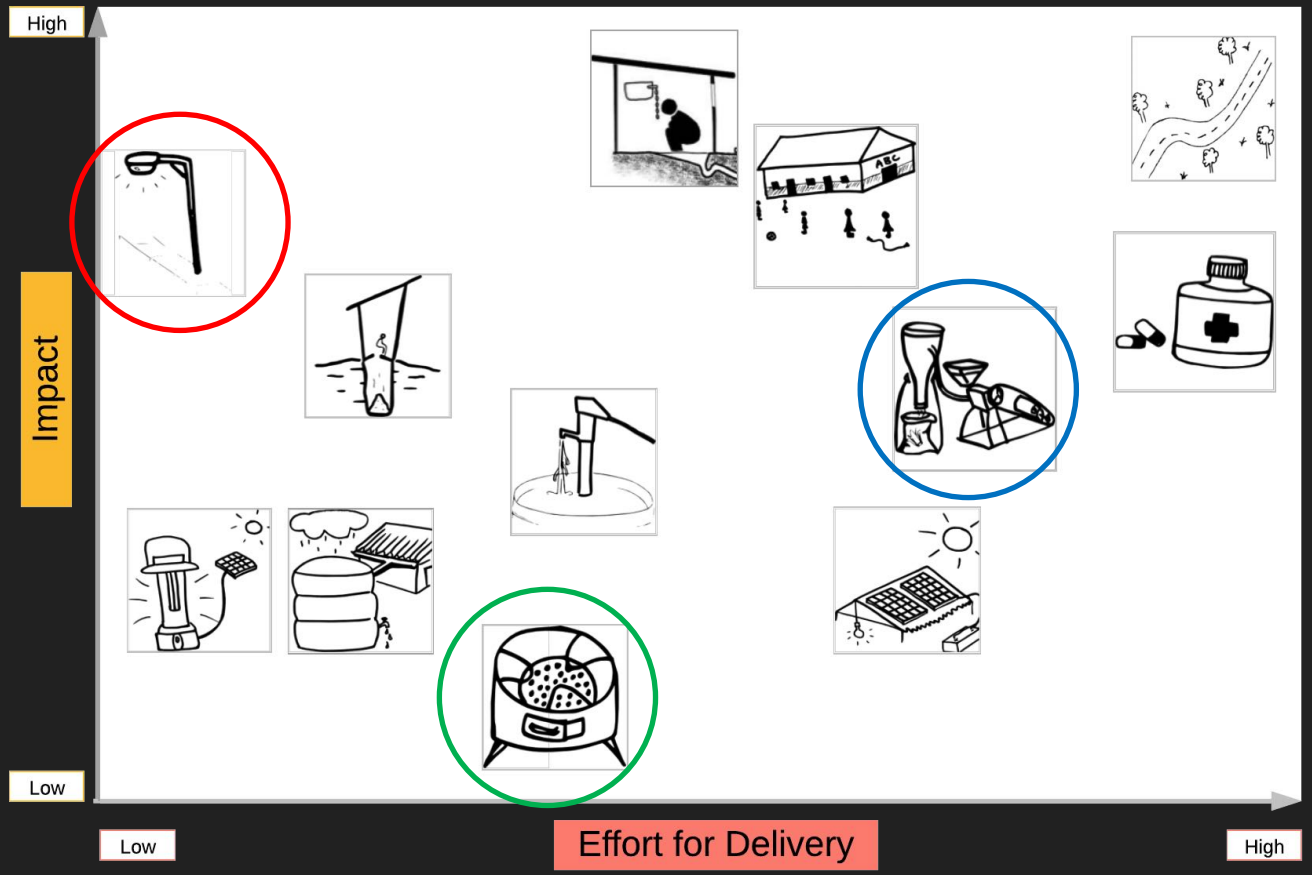
Environment

- Stemming biodiversity loss and environmental degradation.
- Using environmentally sustainable technologies.
- CO2 emissions (actual emission and loss of opportunity to reabsorb).

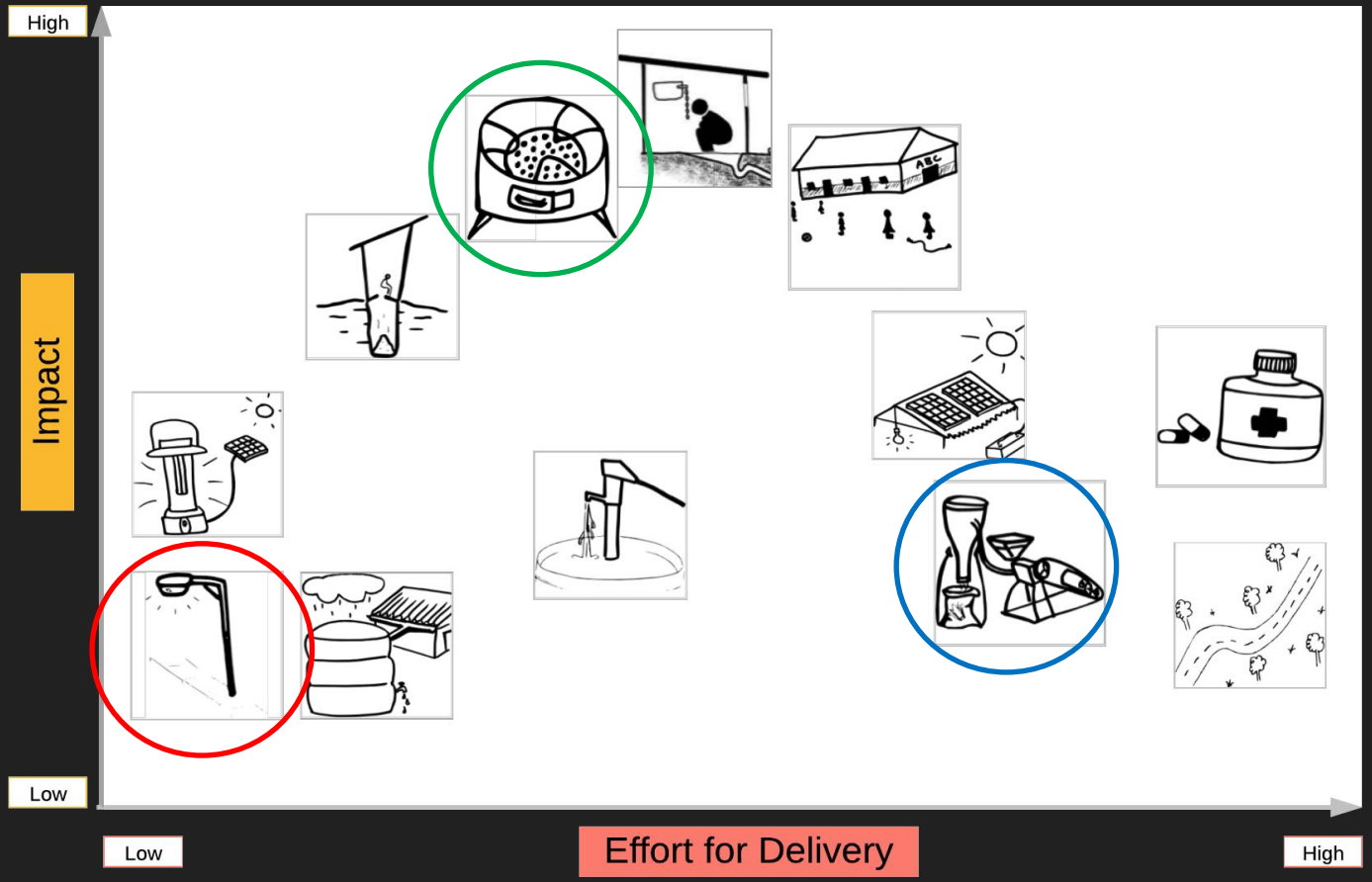
Example: UPV data collection

"If I have a flush toilet in my house I think I can be a king of all kings because I can't go out on those squatting latrines [Aspiration]. By the way you can get diseases on those squatting latrines […] [Preservation of health]. As me Scola the widow it can protect me from going outside alone. My husband used to escort me […] and recently I was almost rapped by a thug when I escorted my son to the latrine at around 10:30pm in the night [Security].
That flash toilet it help a lot on those young children who are just learning how to sit on the toilet because there no risk that a kid will fall into the toilet [Role Fulfilling], actually we have so many cases in our village of kids that fall into pit latrine, like 6 cases are reported every after one year [Safety].

Understanding infrastructure service impact: Prioritising social impact

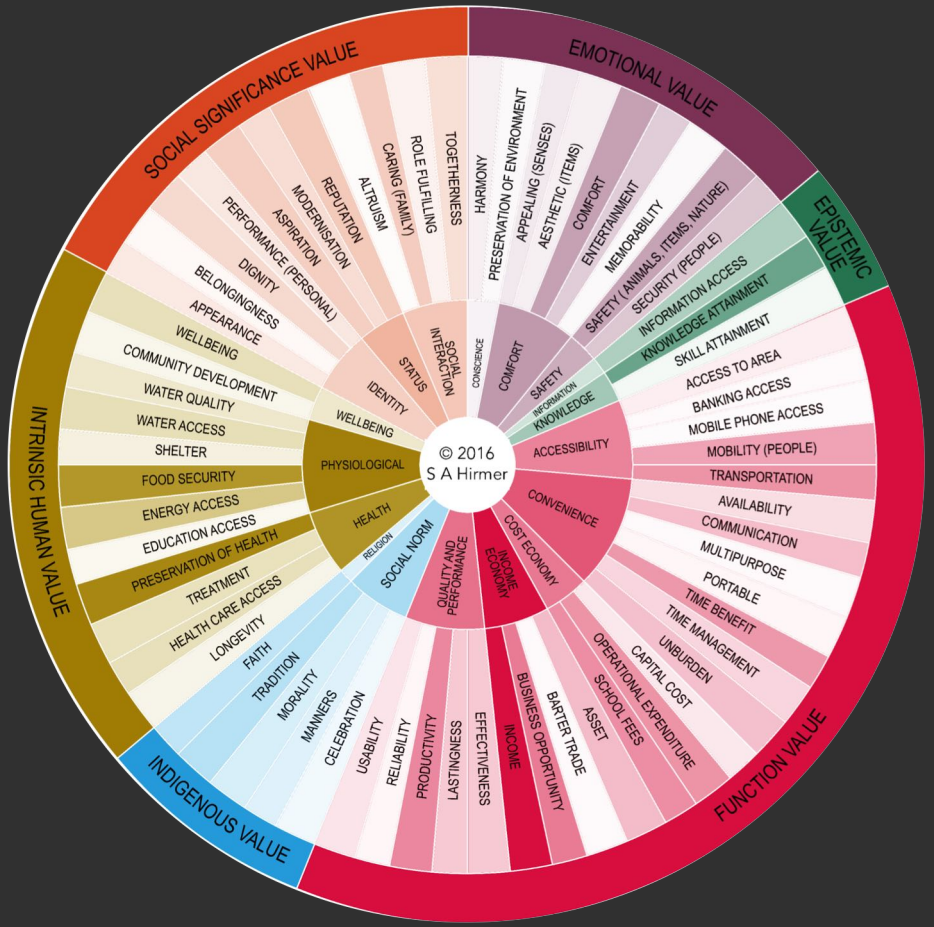


Understanding infrastructure service impact: Prioritising environmental impact



User-perceived value

"...benefits, concerns, feelings and underlying drivers that act as the main motivators in the lives of the people".



Hirmer, S. (2018) *Improving the sustainability of rural electrification schemes: Capturing value for rural communities in Uganda*. University of Cambridge.

Benefits as perceived by users

FOR US. If THEY have a flush toilet in their house….

HEALTH

HYGIENE

Worldwide, diarrhea is the 2nd biggest killer of children under five years old.

FOR SCOLA. If YOU have a flush toilet in your house….

PRESTIGE

….you can be a *'technological leader'* in your village.

SAFETY

…. you can protect your children from falling into the toilet.

SECURITY

… you can be protect from going outside alone at night and be protected from thugs.

Importance of understanding users at different stages of the project

Plan

Design

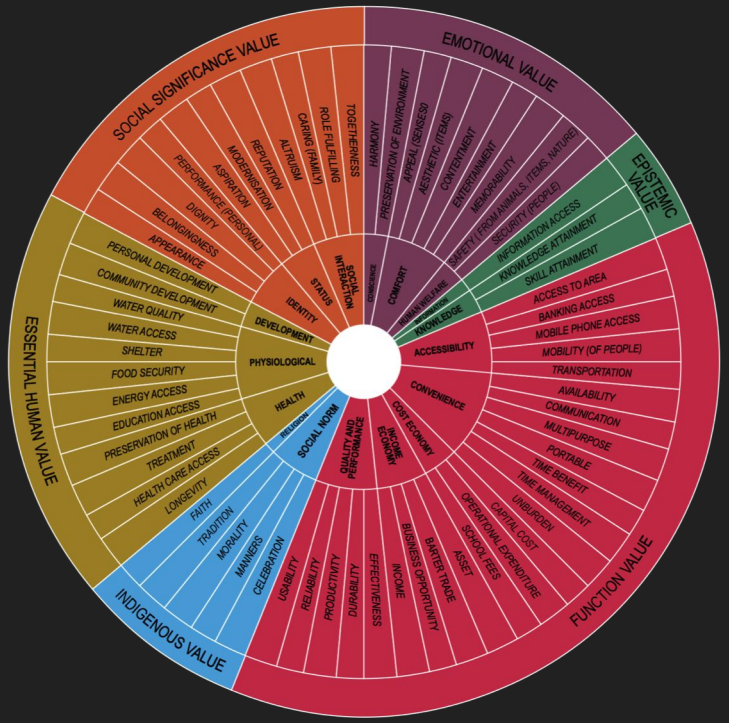
Implement

Communicate

Why understanding users of infrastructure is important.

"Most poor customers are no different from any other in how they make purchasing decisions; their limited means simply makes them extremely good at assessing risk and value".
(Hirji, 2015)

Hirji, K. (2015) 'Accelerating Access to Energy: Lessons learnt from efforts to build inclusive energy markets in developing countries', *Boiling Point*, (65), pp. 2–6.



Thank you.

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