Remote, Rural, and Peripheral:

Energy equity and Spatial Justice in Marginalised Contexts of the Global South

Dr Rihab Khalid

@rihab_khalid | rk538@cantab.ac.uk | R.Khalid@lboro.ac.uk

MECS Programme, Geography & Environment,
Loughborough University
Lucy Cavendish College, University of Cambridge

Spatializing Energy Justice

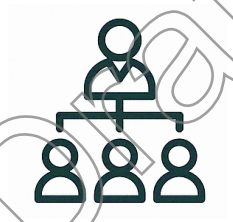
How Spatial Marginalisation in Energy Access Occurs (drawing on Bouzarovski and Simcock, 2017):

Uneven Infrastructure Development

Landscapes of Material Deprivation

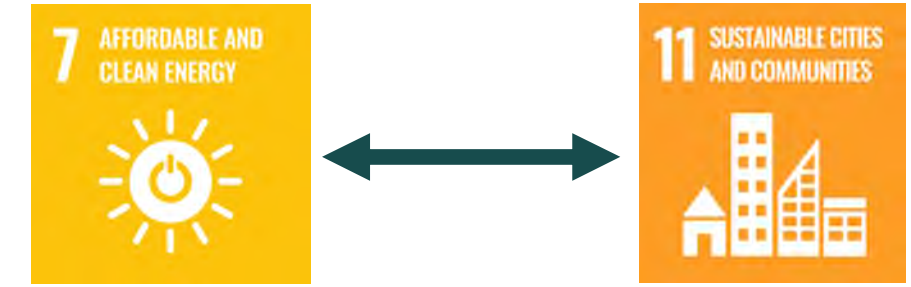
Geographic Underpinnings of Energy Affordability

Scalar Politics and Governance Gaps



Vicious Cycles of Vulnerability

Spaces of Misrecognition



ENERGY **SPACE**

*Bouzarovski, S., Simcock, N., 2017. Spatializing energy justice. Energy Policy 107, 640–648. https://doi.org/10.1016/j.enpol.2017.03.064

Research Questions

The Remote

(Desert village, Tharparkar, Sindh)

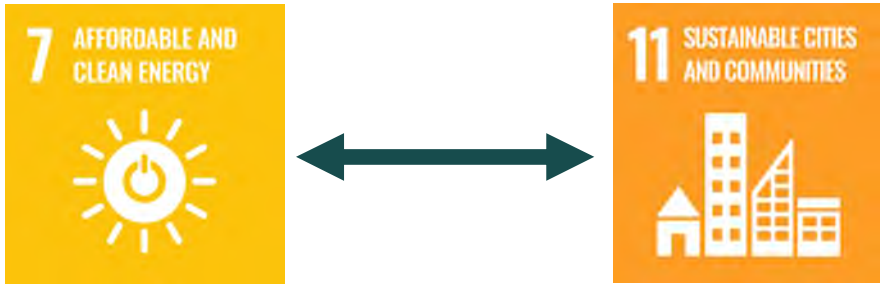
The Rural

(Mountain community, Khyber Pakhtunkhwa)

The Peripheral

(Informal low-income neighbourhoods, Lahore)

- **A case of off-grid solar electrification-** accounting for the needs of marginalised groups to ensure equity and inclusivity.
- **decentralised community-driven micro-hydro power projects-** the role of democratic governance.
- **Grid-connected energy infrastructure in low-income urban areas-** peripheral urbanisation and the (re)production of gendered and socio-economic disparities.



ENERGY **SPACE**

Pakistan- Context overview

Energy mix

- Heavily dependent on thermal fossil fuel resources: ~80% of primary energy supplies and ~66% of installed electricity generation.

Energy Policy

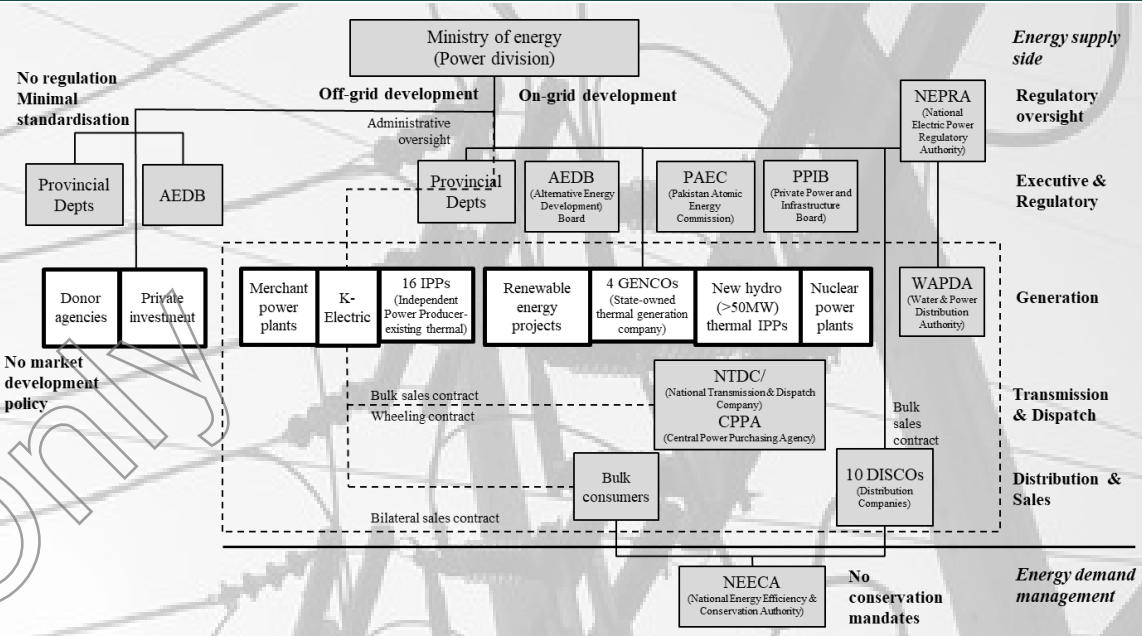
- Centralised electricity generation and distribution system under DISCOs (Distribution Companies).
- Primary focus on federal utility-scale projects in areas already served by the national grid. National Transmission and Dispatch Company formulated number of short and long-term grid expansion plans, but largely ignored in policy.

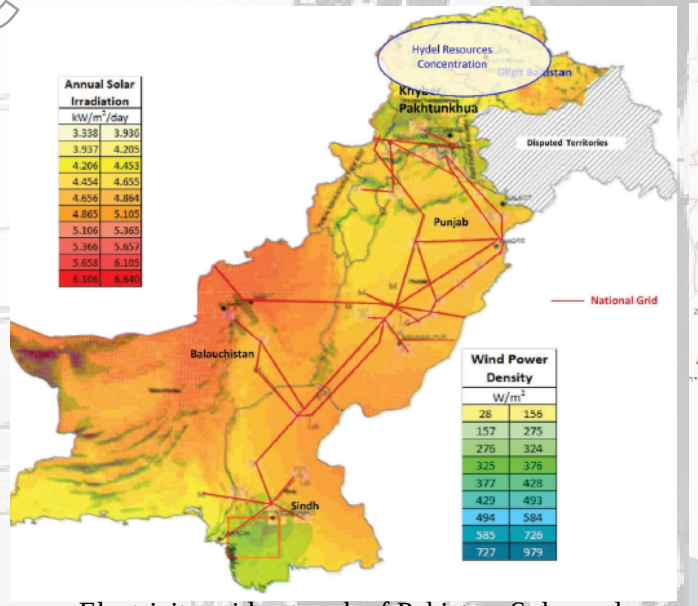
Energy challenges

- Current electricity shortfall of ~**5000MW**.
- **12 million** lack access to electricity.
- Million lack reliable access due to blackouts that can last over 12 hours per day.
- Lack of policy mechanisms at the federal or provincial level for off-grid electrification.
- Severe limitations in off-grid rural electrification: lack of technical expertise, limited data and knowledge of market potential, lack of financing and government support.

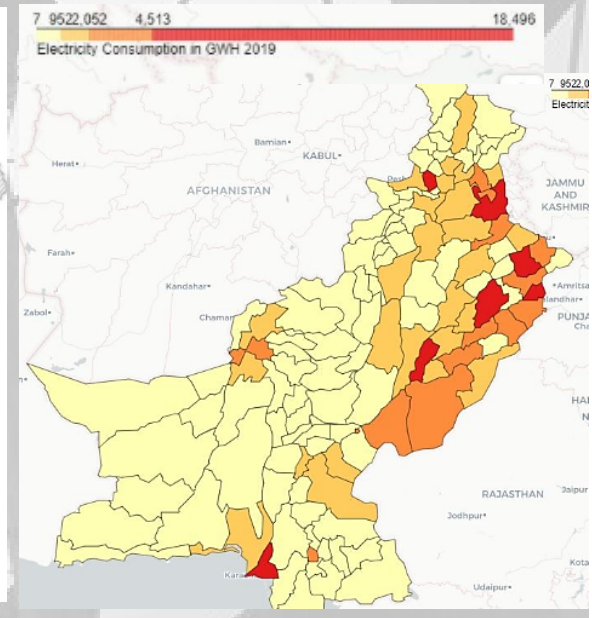
Energy targets

- **20%** renewables by **2025** and **60% by 2030** (30% from non-hydro)





Electricity grid network of Pakistan. Solar and wind-power densities



Province-wise electricity consumption

The Remote: exploring energy equity and inclusivity in off-grid solar electrification

Remote Case-study context: Tharparkar, Sindh

Helario Pir, Tharparkar, Sindh

Renewable and Sustainable Energy Transition 4 (2023) 100067

Contents lists available at ScienceDirect

Renewable and Sustainable Energy Transition

journal homepage: www.journals.elsevier.com/renewable-and-sustainable-energy-transition

Full-length article

Towards equitable and inclusive energy systems for remote off-grid communities: A socio-technical assessment of solar power for village Helario in Tharparkar, Pakistan

Rihab Khalid [a,*], Stefano Landini [b], Gordhan Das Valasai [c], Faryal Khalid [d], Philip Sandwell [e]

[a] Department of Architecture, University of Cambridge, 1 Scroope Terrace, Cambridge CB2 1PX, UK
[b] School of Engineering, University of East Anglia, Norwich Research Park, Norwich NR4 7TJ, UK
[c] Department of Mechanical Engineering, Quaid -e- Awam University of Engineering, Science and Technology, Sakrand Road, Nawabshah, Shaheed Benasirabad, Sindh 67450, Pakistan
[d] Faculty of Environment, Science and Economy (ESE), University of Exeter, SERSF Building, G0.2, University of Exeter, Penryn Campus, Tremough, Penryn. TR109FE, UK
[e] Department of Physics, Imperial College London, Prince Consort Rd, South Kensington, London SW7 2BW, UK

ARTICLE INFO

Keywords:
Energy systems
Energy modelling
Rural electrification
Solar photovoltaic
Socio-technical analysis
Gender equity
Global south

ABSTRACT

Universal access to clean electricity (SDG7) in remote areas of the rural South remains a key challenge for economic growth, and has particular implications for equitable, inclusive and sustainable development. In Pakistan, techno-economic constraints in grid expansion for last-mile users, combined with the country's high solar energy potential make off-grid solar energy generation a viable solution, provided its technological, social and economic implications are well-understood in terms of actual energy demands and designed for equitable distribution. This paper presents a socio-technical feasibility assessment for designing equitable and inclusive off-grid solar systems using the case-study of Helario village in Tharparkar, Pakistan, with a key focus on gender-specific benefits. A mixed-methods approach is used to conduct a baseline field assessment of existing energy sources, community needs, women's access and energy use, affordability, future energy aspirations and social acceptability of renewable energy technologies. Results indicate gendered differences in mobility, education, everyday practices and income that have socio-economic implications, whereby women can benefit more from electrification, particularly when electricity is interlinked with access to clean water. Results are used to model, simulate and optimise a solar-battery mini-grid system for tiered and equitable energy access using CLOVER. Analysis shows that a system designed with a 10-year lifetime provides the lowest levelised cost of electricity and minimum emissions intensity, emphasising the need for long-term energy system planning. This paper serves as a demonstration for policymakers, project developers and rural communities for designing more equitable and inclusive energy systems with clear gendered implications for sustainable future access.

Remote Case-study context: Tharparkar, Sindh

Helario Pir,
Tharparkar, Sindh

- **Fertile desert** with rain-fed **agriculture** as the main livelihood.
- **Tropical desert climate**, reaching temperatures of **45-48°C in summers** and avg. temperature of **20°C in winters.**
- Increasing frequency and severity of droughts in recent decades has resulted in **reduced agricultural yield,** leading to increased poverty, food insecurity and water scarcity.

Remote Case-study: Tharparkar, Sindh

Key findings: Baseline survey

Education level in Helario village.

Gender	E1	E2	E3	E4	E5	E6	E7	E8	E9
Total	9 %	24 %	14 %	36 %	8 %	6 %	0 %	0 %	4 %
Male	7 %	19 %	13 %	41 %	10 %	8 %	0 %	0 %	2 %
Female	12 %	33 %	16 %	28 %	3 %	2 %	0 %	0 %	7 %

Legend: E1 Nursery, E2 Primary (1–5), E3 Secondary (6–8), E4 Matric (9–10), E5 Intermediate (FA/FSc), E6 BA/BSc, E7 MA/MSc and above, E8 Vocational training, E9 Apprenticeship.

Salary [PKR] distribution in Helario village.

Gender	Min	25 % Quantile	Median	75 % Quantile	Max	Mean
ALL	600	7125	10,000	20,000	300,000	15,157
Male	1000	8000	10,000	20,000	300,000	15,702
Female	1000	2850	5000	7750	30,000	6863

Occupation of residents in Helario village.

Occupation	Total	Male	Female
Farmer	3 %	3 %	3 %
Labourer	23 %	32 %	3 %
Small Business - Owner	1 %	2 %	0 %
Small Business - Worker	2 %	3 %	1 %
Government employee	10 %	14 %	1 %
Housewife	7 %	—	21 %
Student	46 %	37 %	65 %
Unemployed	2 %	3 %	1 %
Invalid	0 %	1 %	0 %
Retired	1 %	2 %	0 %
N/A	4 %	3 %	5 %

Remote Case-study: Tharparkar, Sindh

Remote Case-study: Tharparkar, Sindh

Appliances used in Helario village

Item	Total Units
Candles	743
Fixed Lights	502
Mobile phone charger	184
Torches	152
Fan	45
Solar lamps	41
Sewing machine	24
Water pump	6
Kerosene lamps	1

Who is the primary collector of firewood/ sticks?	**Adult male:77%** Adult female: 3% Child male: 16% Child female: 3%
Who is the primary collector of manure/biomass?	Adult male:12% **Adult female: 63%** Child male: 12% Child female: 13%
How often do you get (any) batteries charged from outside the village?	Weekly: 8% Fortnightly: 20% **Monthly: 67%** Every few months: 4%
What is energy (e.g. lighting) in your home usually used for? (Multiple selections possible)	**Cooking: 96%** Cleaning: 9% **Studying: 66%** Socialising: 5% Recreation: 3% Working: 18% **Safety/Security: 57%** Moving around easily: 37%
What lighting source is specifically used for studying?	**Candles: 47%** Keronese: 3% Solar lamp: 21% Firewood: 29%

Remote Case-study: Tharparkar, Sindh

Remote Case-study: Tharparkar, Sindh

DAWN
E-PAPER | MAY 08, 2025

HOME LATEST PAK-INDIA TIES GAZA SIEGE PAKISTAN OPINION BUSINESS IMAGES PRISM WORLD SPORT BREATHE MAGAZINES TECH VIDEOS POPULA

Tharparkar gets 'Asia's biggest solar RO plant'

The Newspaper's Staff Correspondent | Published January 8, 2015

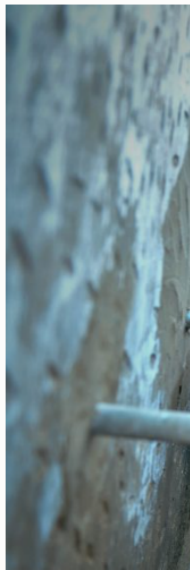
PPP co-chairman Asif Al
Wednesday.—INP

TOPICS EXPLORE PROJECTS Dialogue Earth NEWSLETTERS

WATER

Expensive water plants won't quench thirst in Pakistan's Thar desert

Government investme
water problems for pe
construction of canals



DAWN
E-PAPER | MAY 08, 2025

HOME LATEST PAK-INDIA TIES GAZA SIEGE PAKISTAN OPINION BUSINESS IMAGES PRISM WORLD SPORT BREATHE MAGAZINES TECH VIDEOS POPULAR ARCHIVE FLOC

Water crisis deepens in Thar as firm warns of shutting RO plants

Hanif Samoon | Published June 4, 2018

Locals queue up to fetch water from an RO plant in Tharparkar. — Photo by Author

THE EXPRESS TRIBUNE
TODAY'S PAPER | MAY 07, 2025 | EPAPER

HOME LATEST PAKISTAN BUSINESS WORLD SPORTS ENTERTAINMENT OPINION LIFE & STYLE T-MAGAZINE BLOGS TECH VIDEOS

Sindh

555 out of 834 govt RO plants in Thar are dysfunctional

CM orders inquiry against contractor, recovery of funds released to his firm

Our Correspond

voicepk.net

News Exclusive Shows In Focus Exclusives Events About Us اردو ویب سائٹ

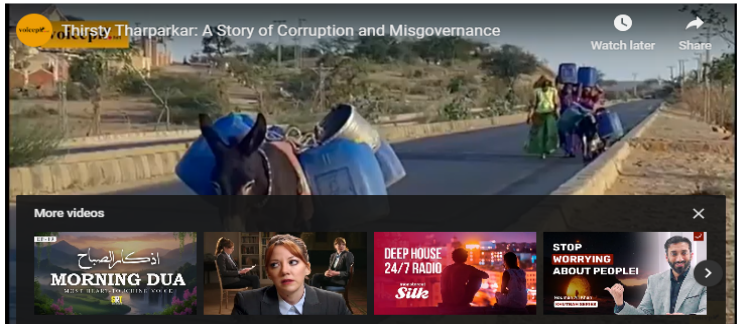
Voicepk.net > Uncategorized > Thirsty Tharparkar: A Story of Corruption and Misgovernance

UNCATEGORIZED

Thirsty Tharparkar: A Story of Corruption and Misgovernance

Who understands the value of water better than people like Seeta, Mano, and Irfan? Their story serves as a powerful counterpoint to today's global celebrations of World Water Day—a reminder that for many, water isn't just a resource to be managed but a matter of daily survival threatened by human failings rather than natural scarcity. In Pakistan's southeastern desert region of Tharparkar, World Water Day is not an occasion for symbolic gestures but a stark reminder of an ongoing crisis. While international dialogues focus on sharing water resources across borders, residents here fight a more immediate battle—simply finding enough water to survive.

6 Min Read | Save it



Popular News

UNCATEGORIZED

Accused secure bail despite killing woman in 'honour'-based killing

May 5, 2025 By Rehan Piracha LAHORE
Three male relatives accused of

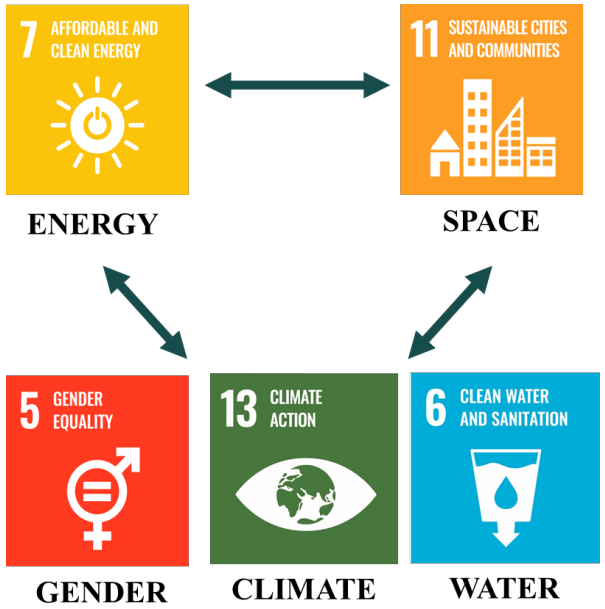
Remote Case-study: Tharparkar, Sindh

Remote Case-study: Tharparkar, Sindh

Remote Case-study: Tharparkar, Sindh

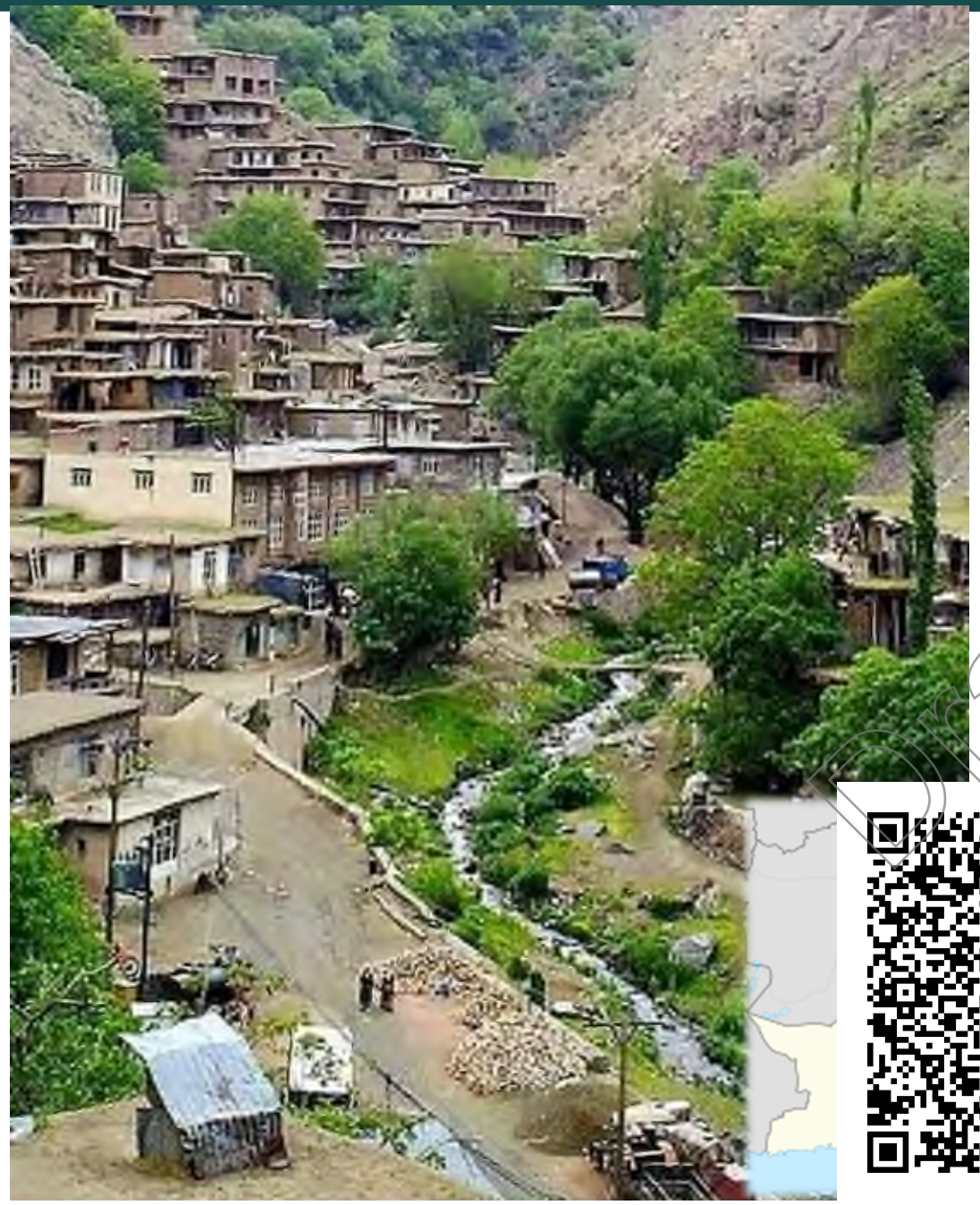
Key Reflections on Spatial Marginalisation and Justice:

- The absence of grid infrastructure in Helario reflects **historical patterns of state neglect and infrastructural disinvestment** in remote desert regions that already face **distributive material deprivation**.
- **External dependence** for basic energy services creates a **spatialised cost burden** on already marginalised households- creating **vicious cycles of vulnerability.**
- Women's energy needs remain overlooked, creating **spaces of misrecognition** and reflecting a **failure to integrate local, gendered experiences** into infrastructure planning.
- Addressing energy injustice in Helario requires not only technological solutions but a **reconfiguration of infrastructural priorities** to include situated geographical experiences, co-produced through local capacity building and **place-based solutions**.



The Rural: Exploring democratic governance in micro-hydro power projects in KPK

Rural Case-study: MHP projects in KPK



IOP Publishing Environ. Res.: Infrastruct. Sustain. 4 (2024) 035015 https://doi.org/10.1088/2634-4505/ad7886

ENVIRONMENTAL RESEARCH
INFRASTRUCTURE AND SUSTAINABILITY

PAPER

Community energy and socio-technical infrastructure resilience: analysis of mini/micro hydro power projects in Khyber Pakhtunkhwa, Pakistan

Rihab Khalid[1,*], Abdul Basit[2,3], Maria Sohail[3], Tanvir Ahmad[4] and Noor Muhammad[3]

[1] Lucy Cavendish College, University of Cambridge, Cambridge, United Kingdom
[2] NPCC, National Transmission & Despatch Company, Ministry of Energy, Pakistan
[3] US Pak Center for Advanced Studies in Energy, University of Engineering and Technology, Peshawar, Pakistan
[4] United Nations High Commissioner for Refugees (UNHCR), Pakistan, Ramna 4 Diplomatic Enclave, Islamabad, Islamabad Capital Territory 44000, Pakistan
* Author to whom any correspondence should be addressed.

E-mail: rk530@cantab.ac.uk, abdul.basit3@ntdc.com.pk, mariasohail200@gmail.com, ahmadt@unhcr.org and noor.muhammad@uetpeshawar.edu.pk

Keywords: decentralised energy, community energy, participatory development, gender equity, global south, socio-technical infrastructure, energy justice

OPEN ACCESS

RECEIVED
16 May 2024

REVISED
9 August 2024

ACCEPTED FOR PUBLICATION
9 September 2024

PUBLISHED
19 September 2024

Abstract

In 2014–15, Pakistan's provincial government of Khyber Pakhtunkhwa (KPK) launched a decentralised power generation initiative, installing over 356 small hydro power units to provide electricity to over 2.5 million people in its mountainous regions. This initiative built on the foundation of prior community-based mini/micro hydro-power projects (MHPPs) deployed in the region since the 1980s that have experienced mixed success; by 2020, over 150 units were non-operational. This paper investigates the socio-technical factors influencing the success and failure of these projects, focusing on outcomes and processes integral to community MHPPs. The study analyses the critical implications of MHPPs for socio-economic welfare, gender equity and democratic governance through extensive primary research including field observations at 40 sites, questionnaire surveys with community residents in three in-depth case-studies, and expert interviews with local policymakers and project developers. Analysis shows that electricity provision from MHPPs has had positive outcomes for the communities in terms of improved education, poverty alleviation and economic growth, alongside enhanced access to information and gains in women's entrepreneurship and health. Nonetheless, the study also identifies significant shortcomings in the processes involved in community MHPPs related to inadequate technical assessments, monitoring, and evaluation, as well as challenges arising from undemocratic governance mechanisms and inequitable participation. By teasing out the multiple socio-technical dimensions that shape infrastructure resilience of MHPPs in KPK, this paper contributes to the broader discourse on sustainable community energy projects and informs policy for decentralised energy transitions that ensure democratic alignment and inclusive design.

Rural Case-study: MHP projects in KPK

Ayun MHPP, Chitral

Ashoran MHPP, Kalam

Jungle Inn MHPP, Kalam

KPK's provincial government and the Pakhtunkhwa Energy Development Organization (PEDO) embarked on an ambitious journey to electrify its remote regions, aiming to install over **1000 small hydro power units by 2024.**

Supported by local NGOs (like the Sarhad Rural Support Programme (SRSP) and Agha Khan Rural Rural Support Programme).

Aim to provide electricity to over **1.5 million people** in the region.

Rural Case-study: MHP projects in KPK

Success:

Socio-Economic Development

- Poverty reduction and enhanced economic opportunities in impoverished communities.
- Increased girls' school enrolment, especially in Kalam due to SRSP-managed power houses.
- Better access to education and healthcare services.

Support for Local Businesses and Agriculture

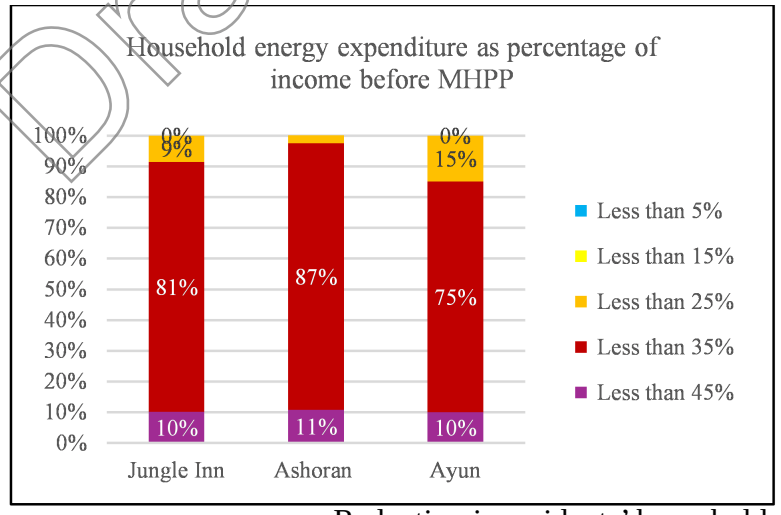
- Reliable electricity extended business hours for shops and hotels, boosting growth.
- Enhanced agricultural practices leading to increased income and reduced food scarcity.

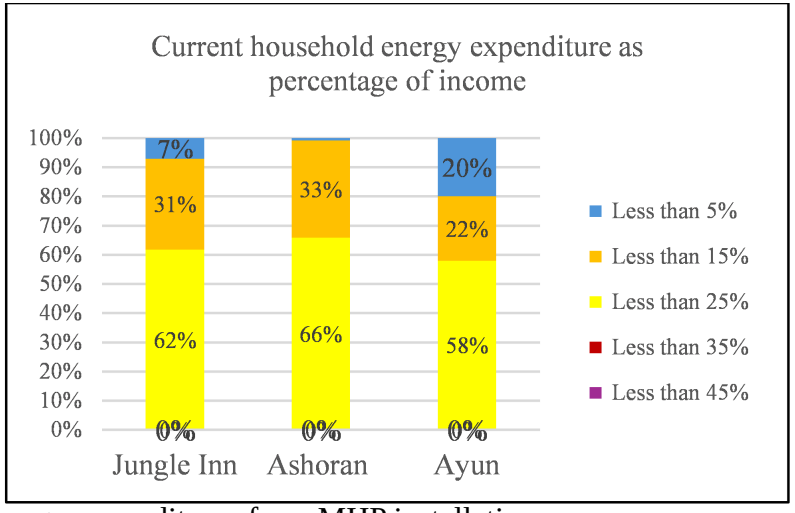
Reduced Household Energy Costs

- Transition from wood and biomass to electricity for heating.
- Lower energy expenses and reduced health issues from respiratory illnesses.

Environmental Benefits

- Improved vegetation and reduced deforestation.
- Cut carbon emissions by 66,000 tonnes annually since 2016.
- Decreased reliance on fossil fuels, saving community costs.





Reduction in residents' household energy expenditures from MHP installation

Rural Case-study: MHP projects in KPK

Key Challenges and Failures:

Geographical and Environmental Hurdles

- **Water flow variability**, **droughts**, and **flash floods** affecting MHP operations.
- **Difficult terrain** increasing project costs and complexity.
- Vulnerability to **climate change impacts** like earthquakes and landslides.

Technical and Management Issues

- **Lack of regular monitoring, evaluation, and technical assessment.**
- **Inadequate expertise** for ensuring proper maintenance.
- **Poor data** and unclear post-project ownership.

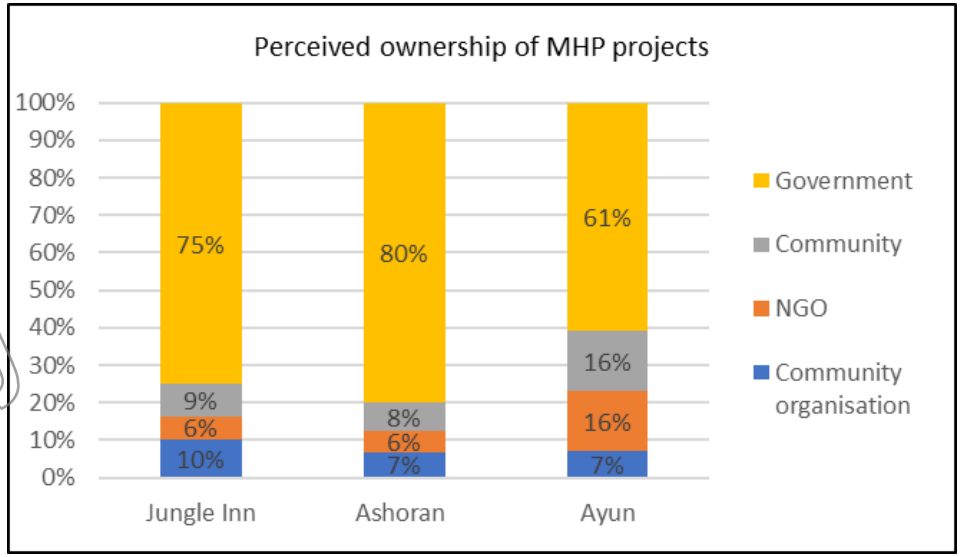
Rural Case-study: MHP projects in KPK

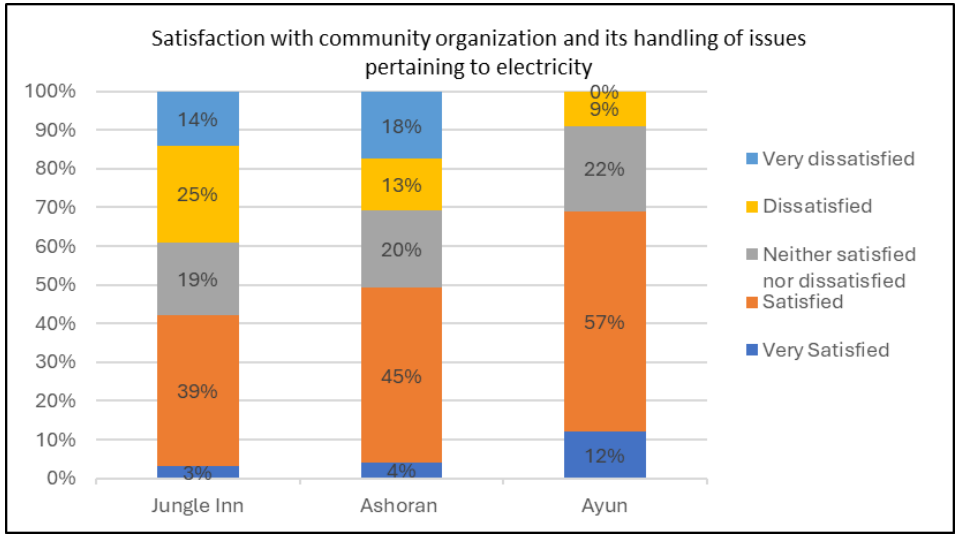
Key Challenges and Failures:

Governance Challenges

- Multiple stakeholders involved, but with unclear or varying roles and **imbalanced responsibilities**.
- Perception that MHPPs are **"owned" by the government**, not the community agreements leading to mismanagement and inefficiency.
- **No formal mechanisms for accountability**, limiting system resilience.
- **Funds** generated from electricity sales can be **poorly managed** with non-materialisation of promised jobs and prosperity.
- **Nepotism and local power struggles** further undermine the fairness of decision-making, reinforcing existing inequalities.

- **Social and Political Challenges**
  - **Sectarian violence** and political conflicts impacting project success.
  - **Weak local administrative capacity** to manage technical projects effectively.

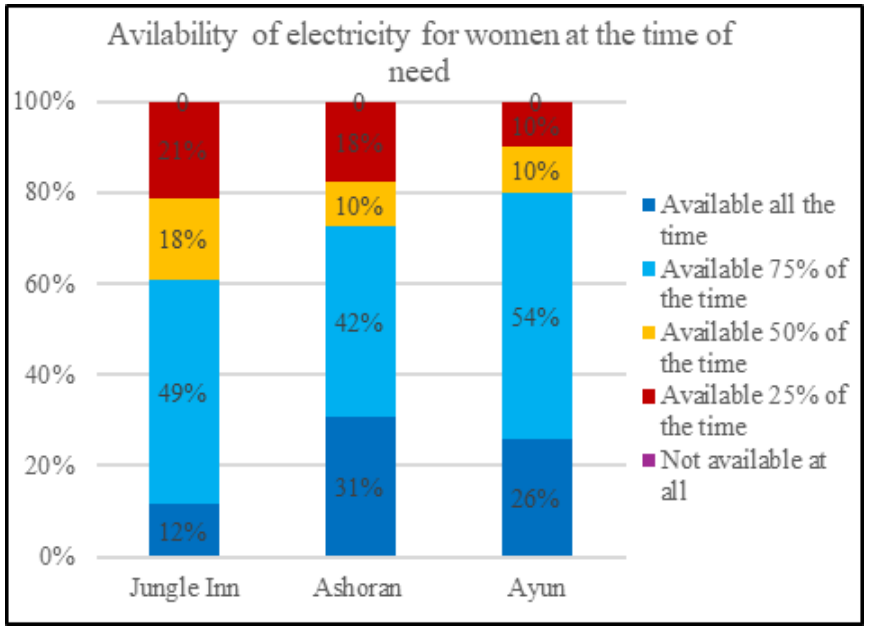




Rural Case-study: MHP projects in KPK

Impact on women:

- Electricity access easing household chores and childcare responsibilities Improved female literacy rates and increased school enrolment.
- Better access to healthcare facilities for women.
- Some women engaging in businesses enabled by electricity access (tailoring, sewing, small shops)



Rural Case-study: MHP projects in KPK

Challenges for women

Limited Participation in Energy Projects

- Minimal inclusion of women in planning, execution, and governance.
- Gender biases in community organizations and decision-making roles.
- Employment for women remains limited, largely confined to domestic roles.

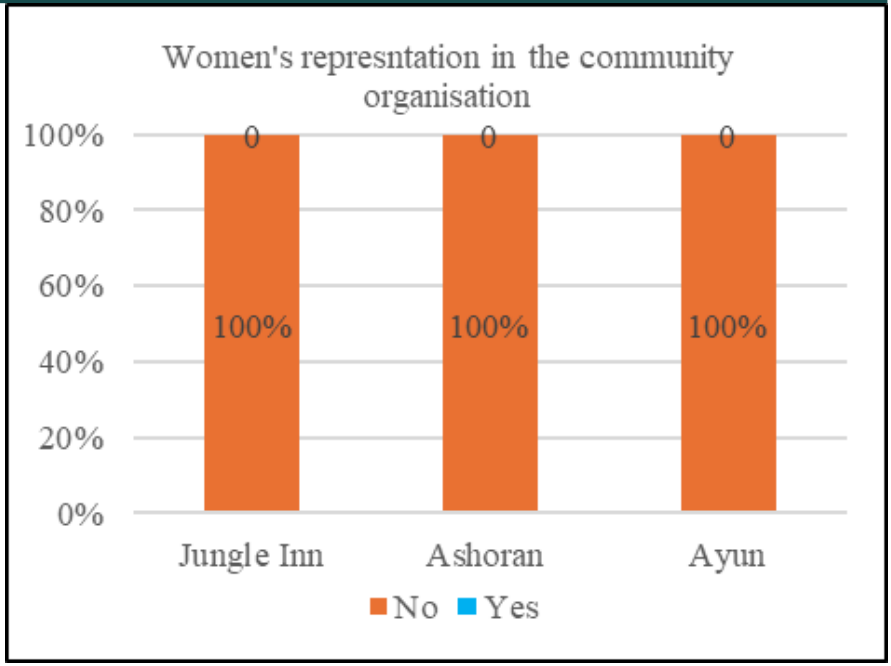
Reliance on Polluting Fuels

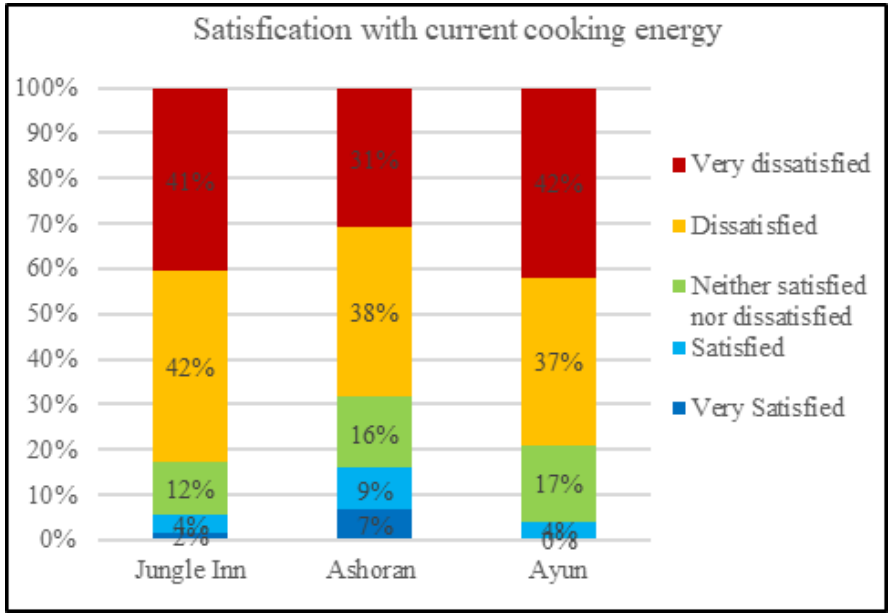
- Cooking practices still depend on inefficient, polluting fossil fuels. Need for clean cooking solutions to be integrated into MHP designs.

Persistent Gender inequalities & Barriers to Decision-Making

- Political instability, religious extremism, and patriarchal norms restrict involvement.
- Low female literacy rates (37% vs. 72% for men).
- High percentage of girls out of school (40%).
- Declining women's labour force participation and parliamentary representation.

> *"When it comes to women's involvement in village communities, we failed. Current socio-cultural norms don't allow us to do so… the social mobilizers jobs were only offered to female candidates. Due to harsh climate, social constrains and hilly terrains, they refused to join."*
>
> *(Male, Regional Energy Institute)*

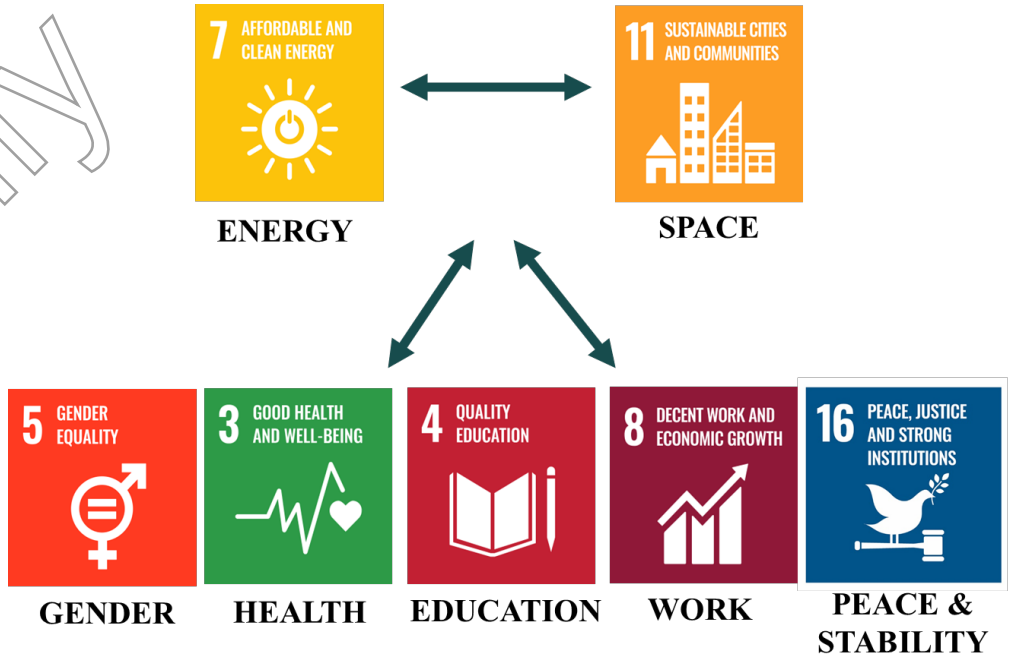




Linking ENERGY, GENDER and SDGs

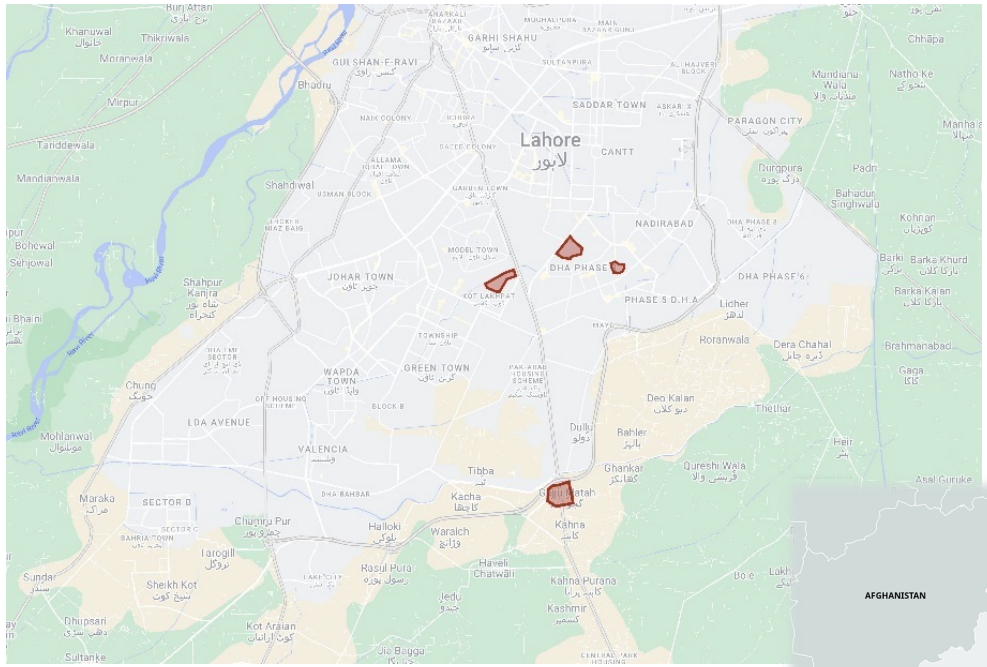
Key Reflections on Spatial Marginalisation and Justice:

- Decentralised energy projects like MHPs emerge in areas that have been deliberately excluded from centralised grid planning, reflecting **scalar disjunctions in energy governance**.
- Spatial marginalisation is not only geographic but institutional—**decision-making power is centralised**, while responsibility is devolved to under-resourced communities.
- Despite bringing electricity, these projects risk **replicating spatial injustice** when local governance structures are elite-dominated. Such **exclusionary infrastructure** risks reproducing **recognition injustices**.
- Technical faults and poor system maintenance reflect **material deprivation and infrastructural abandonment**, where peripheral areas are left with non-functional assets and no support.
- A just energy transition in these regions must **centre inclusive governance**, **challenge local power hierarchies**, and treat community participation as a right—not a risk or burden.



The Peripheral: Exploring the (re)production of gendered and socio-economic disparities in grid-connected low-income neighbourhoods

Peripheral Case-study: low-income neighbourhoods in Lahore



IJURR | IJURR SUSC BOOK SERIES | IJURR FOUNDATION | URBAN RESEARCH PUBLICATIONS LTD |

SEARCH

ijurr
INTERNATIONAL JOURNAL OF URBAN AND REGIONAL RESEARCH

ABOUT IJURR
JOURNAL CONTENT
WEB CONTENT
ARCHIVED

Home ▸ Early View

SPATIALIZING WOMEN'S EVERYDAY ACCESS TO ENERGY: An Intra-Urban Comparison of the Gender–Energy Nexus in Lahore, Pakistan

Abstract

The disparate distribution of energy and housing infrastructures in many megacities of the global South raises issues of equity and spatial justice, particularly for women. An intra-urban comparison helps unpack the specific socio-spatial characteristics of the gender–energy nexus, particularly in low-income neighbourhoods that represent one form of peripheral urbanization. This article contributes to the limited literature on low-income urban women's lived experiences and everyday energy practices. Using a mixed-methods approach that combines 424 questionnaire surveys and 21 semi-structured interviews with low-income women across five case study sites in Lahore, it investigates women's energy access and use in domestic and public spaces, and workplaces. The study reveals significant intra-household variations and gendered inequities within and across neighbourhoods and in their relation to urban cores. It demonstrates how peripheralized energy access is both spatially defined (e.g. in the availability of infrastructure available in peripheral neighbourhoods and in their spatial proximity to urban cores) and socially contingent on intersectional identities. The intra-urban comparison reveals the gendered energy practices and women's subjective experiences of energy exclusion, underscoring the importance of moving beyond private/public dichotomies and instead adopting an intersectional lens when theorizing the gender–energy nexus when studying urban

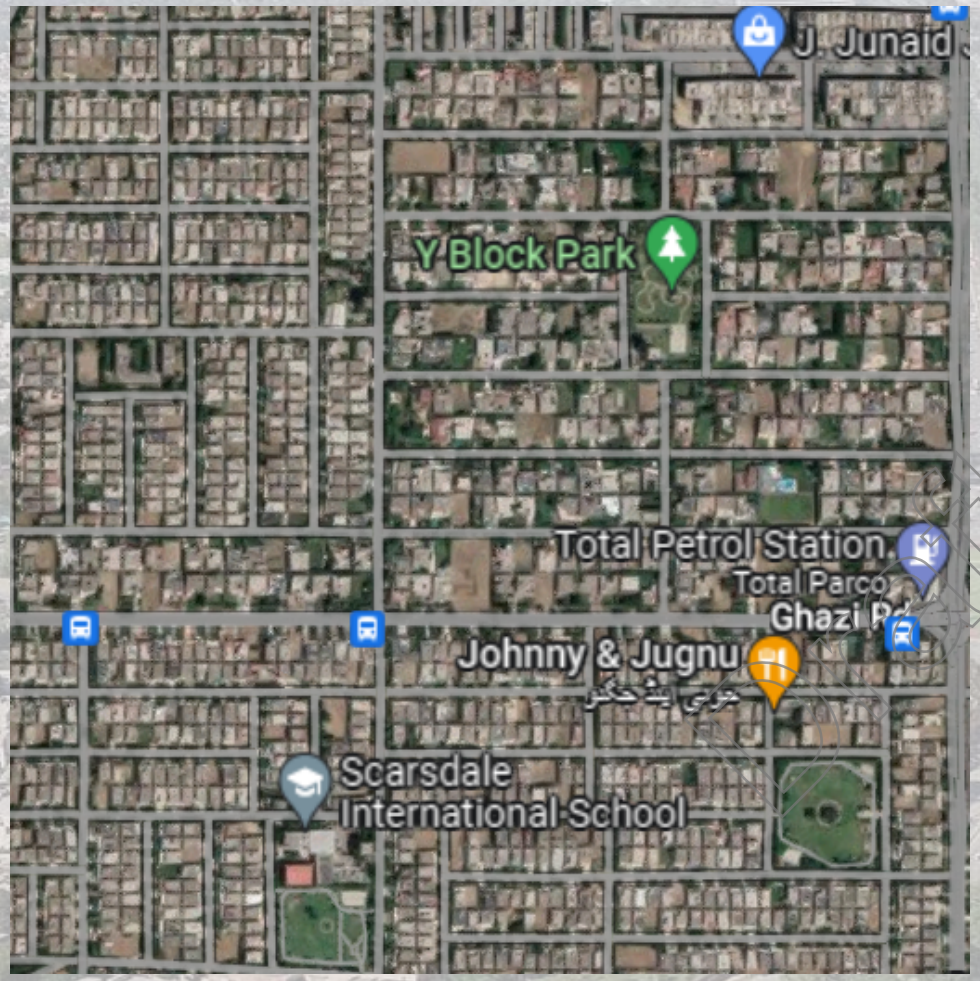
● ● DETAILS

Written by:
Rihab Khalid, Hadia Majid, Rabia Saeed, Alaiba Faheem, Charlotte Lemanski

Digital Object Identifier (DOI)
https://doi.org/10.1111/1468-2427.13311
About DOI

Read full article as PDF
Read full article as HTML

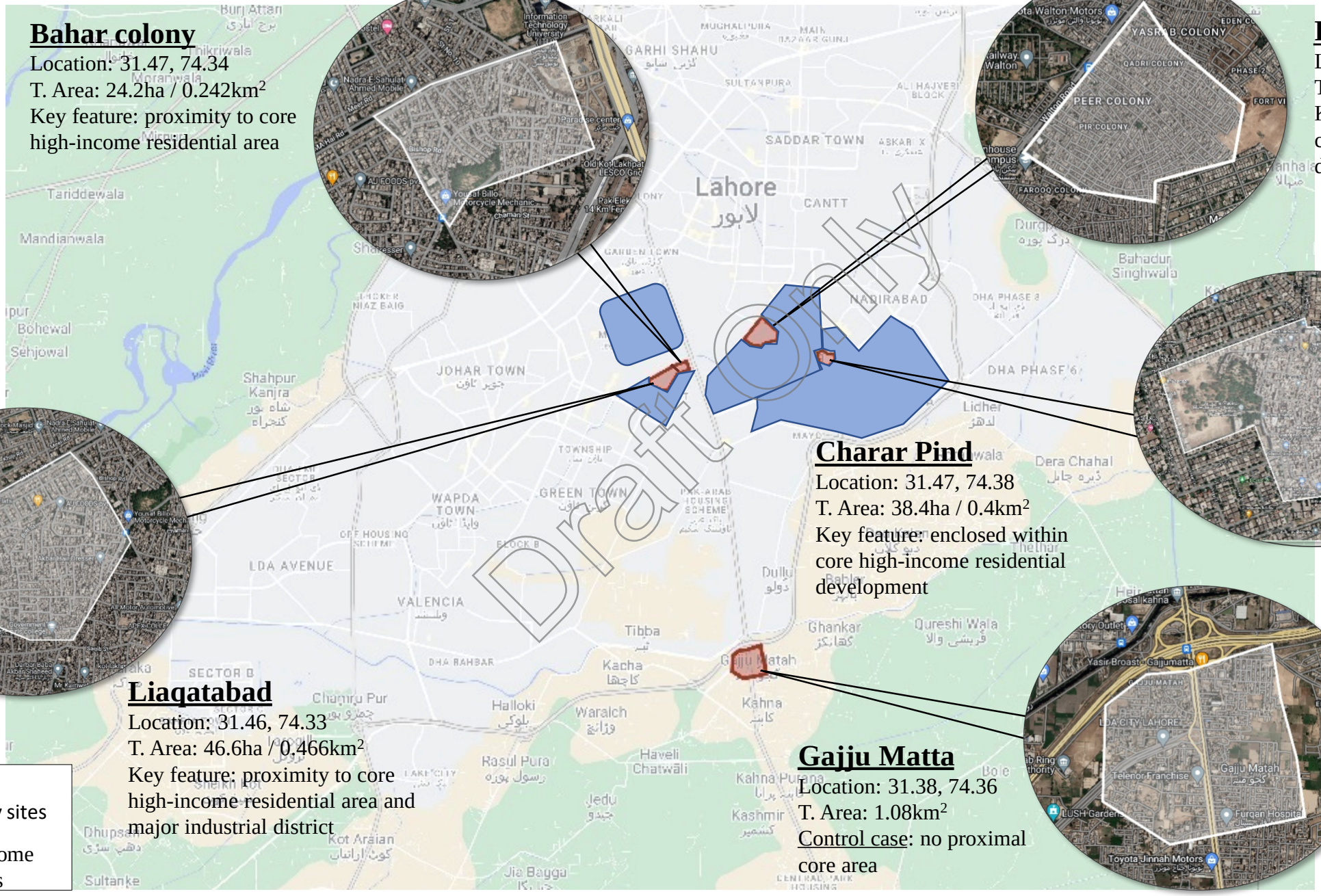
Urban divides between cores and peripheries



Planned formal upper-class residential development

Unplanned informal lower-class mixed-use development

Case-study-Urban peripheries: low-income neighbourhoods in Lahore



Bahar colony

Location: 31.47, 74.34
T. Area: 24.2ha / 0.242km^2
Key feature: proximity to core high-income residential area

Peer colony

Location: 31.48, 74.36
T. Area: 0.762km^2
Key feature: proximity to core high-income residential development

Charar Pind

Location: 31.47, 74.38
T. Area: 38.4ha / 0.4km^2
Key feature: enclosed within core high-income residential development

Liaqatabad

Location: 31.46, 74.33
T. Area: 46.6ha / 0.466km^2
Key feature: proximity to core high-income residential area and major industrial district

Gajju Matta

Location: 31.38, 74.36
T. Area: 1.08km^2
Control case: no proximal core area

Key

- Case-study sites
- Higher-income 'core' areas

Case-study-Urban peripheries: low-income neighbourhoods in Lahore

Key findings

- Women's differential access to energy: ownership of electrical appliances was consistently less in **households with lower income, tenancy residence, less educated women (<10th grade) and in the control case.**

- Women had **less access** to mobile phones and internet/wifi compared to men, across all sites, with women in control case with least access.

- Women working **farther away from home** (e.g., in core city areas), generally had higher access (mobile use:73%; internet/wifi:50%), compared to women working from home or inside their colonies (mobile use:56%; internet/wifi:40%).

Household electrical appliance ownership details

Housing colony/ Ownership of electrical appliances	Lighting and fans	Cooking appliances	Fidge/ Freezer	AC	Washing machine	Clothes iron	Sewing machine	Entertainment (TV/Radio)	Total avg mobile phones owned by HH
Bahar colony	100	86.4	98.5	53	97	83.3	87.9	90.9	2.8
Liaqat Abad	100	57.5	82.5	17.5	90	90	82.5	90	2.75
Peer colony	100	60	82.5	25.8	85	83.3	62.5	82.5	2.4
Charar Pind	99	36	60	15	64	30	68	76	2.25
Gajju Matta	100	35.7	68.4	9.2	73.5	9.2	76.5	65.3	1.95

Case-study-Urban peripheries: low-income neighbourhoods in Lahore

- Women in proximal peripheral areas had **better access to employment and mobility (27%** women unemployed vs **53%** in control case)

- Women in proximal peripheral sites had **better access to public amenities** (in their colonies or in nearby core areas), implying **greater access to electricity infrastructures in public spaces**.

Health-related facilities (72.4% vs 33.6%)

Religious facilities (52% vs 28.5%)

Open/ green spaces (36.6% vs 18.3%)

Case-study-Urban peripheries: low-income neighbourhoods in Lahore

- Proximity to core areas impacted on women's **energy-related know-how, aspirations, and understandings**.
- Women in proximal sites also **longed for more autonomy** and **put greater value to women's right** to energy-related decision-making.
- **Exposure that comes with proximity to core areas** impacts women's energy-related resources, agency and perceptions of right, leading to overall empowerment.

*Zubaida: I've also **learnt using microwave** and other things like **electrical kettle, AC** which I don't have at home, but I know how to use.*

Women's perceived choice, values and norms for decision-making

Housing colony/ Decision-making power	Control over finances				Household electricity use and purchase			
	Choice		Value	Norm	Choice		Value	Norm
	% indicating self-autonomy	% indicating male decision making)	(% ascribing positive value)	(% ascribing positive norms)	% indicating self-autonomy	% indicating male decision making)	(% ascribing positive value)	(% ascribing positive norms)
Bahar colony	13.64	10.61	15.15	21.21	22.73	18.18	45.45	66.67
Liaqat Abad	22.5	47.5	20	15	22.5	55	50	10
Peer colony	36.67	13.33	15.83	17.5	46.67	8.33	21.67	25
Charar Pind	38	40	16	15	39	42	60	54
Average of above	27.83	33.73	13.68	13.92	31.84	36.32	37.03	33.25
Gajju Matta	18.37	**62.24**	5.1	3.06	16.33	**69.39**	21.43	17.35

Case-study-Urban peripheries: low-income neighbourhoods in Lahore

- Women's electricity access dependent on household structures. Many **younger women in joint-family households** are unable to make everyday decisions that impact their electricity consumption.

- **Religion** key factor that impacts women's access to employment, mobility, and public space. **Christian women** had greater control and decision-making power compared to Muslim women.

*Mehek: My mother-in-law washes her clothes in the machine, but I wash mine by hand… **she doesn't allow me to use it**. I cannot use her utensils either. She **scolds me** if I do.*

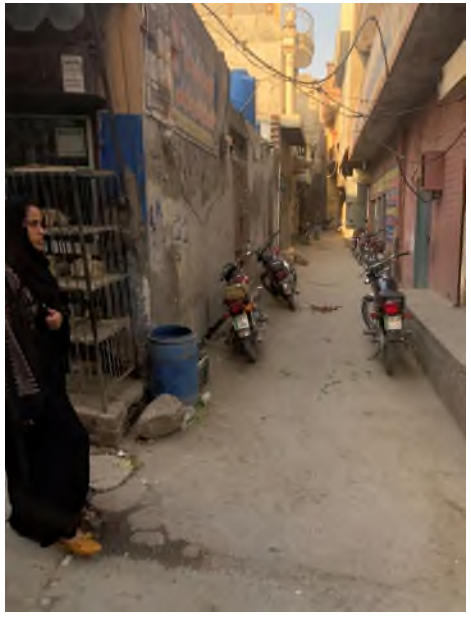
*Shabana: We are Syeds, **we never go outside.** My husband brings everything. You know it's very inconvenient for Syeds specially because **we don't have the permission to go outside.***

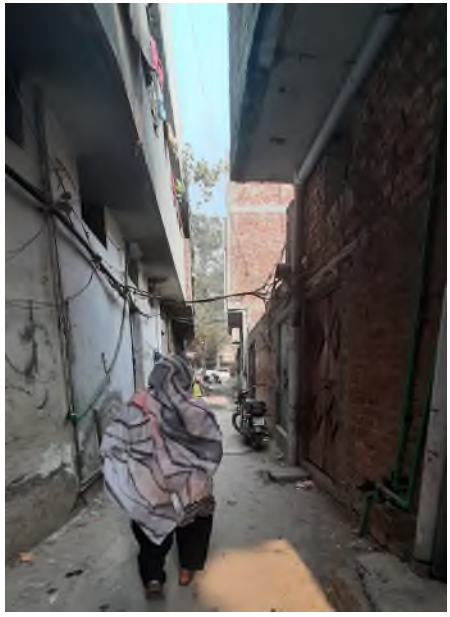
*I: Is there **any space for women** in the mosques here?*

*Aliya: **No***

I: Where do you offer Eid prayer?

Aliya: In our houses. Someone will invite us to their house if they're having an Eid namaz gathering..

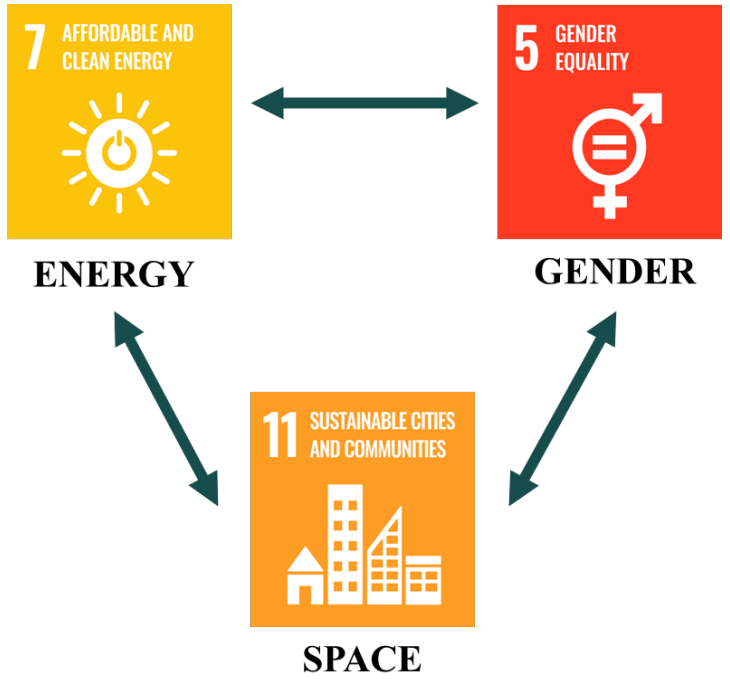




Case-study-Urban peripheries: low-income neighbourhoods in Lahore

Key Reflections on Spatial Marginalisation and Justice:

- Urban peripheries in Lahore, though formally integrated, experience **territorial stigmatisation** and inadequate access to basic energy infrastructure that are **structurally (re)produced** through **core-periphery divides.**
- Peripheralisation can compound vulnerabilities, where informal housing, illegal or fragile connections and poor-quality energy services restrict women's socio-economic opportunities across intersectional lines, **reinforcing cycles of spatial and social exclusion.**
- Energy access as simply a domestic issue ignores women's mobility, employment, and time poverty **across private and public spaces**. This creates blind spots in service provision and a **misrecognition** of women's energy needs.
- Gendered spatial justice requires **recognition** of women's needs**,** **representation** of women in energy decision-making**,** and **redistribution** of infrastructural investment across the spatial hierarchies of the city.



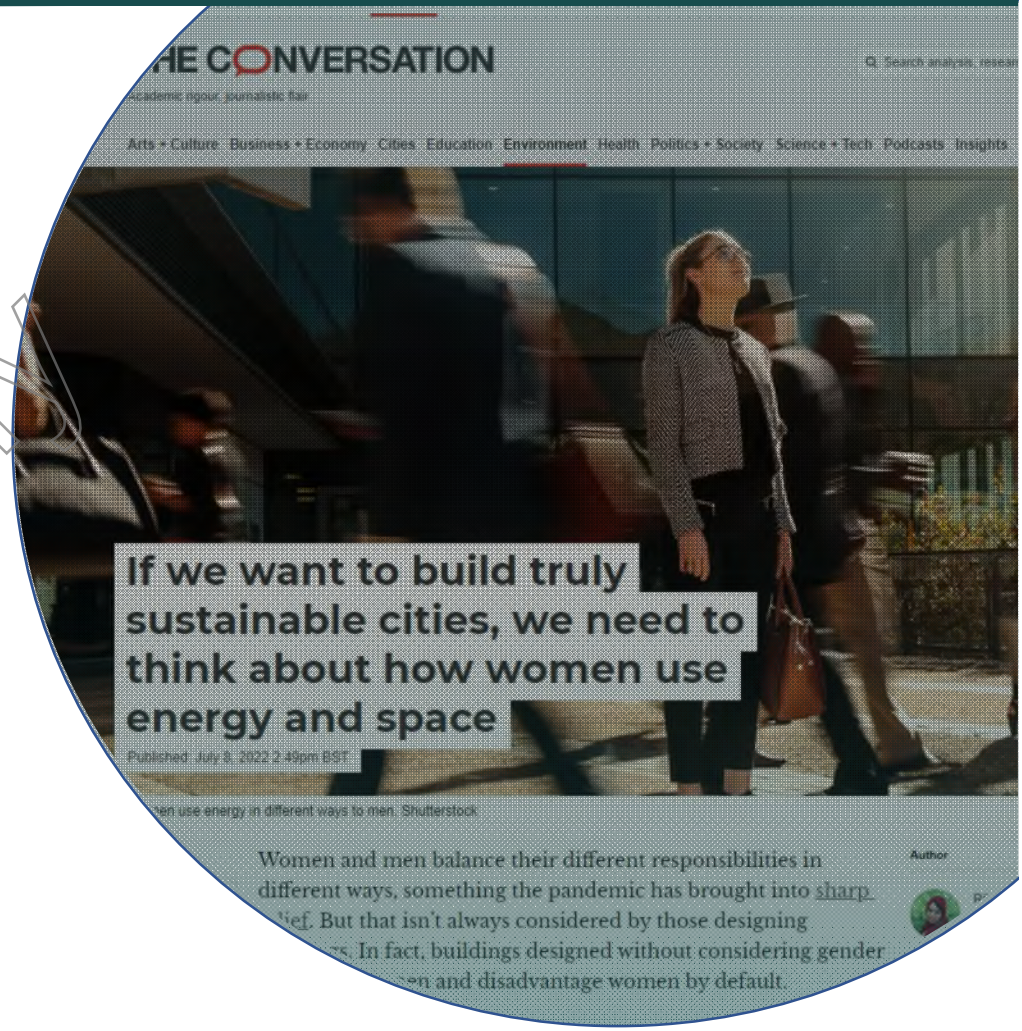
Thank you for listening!

Stay connected and continue the discussion:

@rihab_khalid

Linkedin /rihab-khalid-phd/

R.Khalid@lboro.ac.uk



Questions & Comments