

Searching for Sustainability: Kenya's Energy Past and Future

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Rob Bailis

Assistant Professor

robert.bailis@yale.edu

Charles Kirubi

PhD student

kirubi@berkeley.edu

Arne Jacobson

Assistant Professor

arne@humboldt.edu



YALE UNIVERSITY

**School of Forestry
& Environmental Studies**



Energy &
Resources
Group



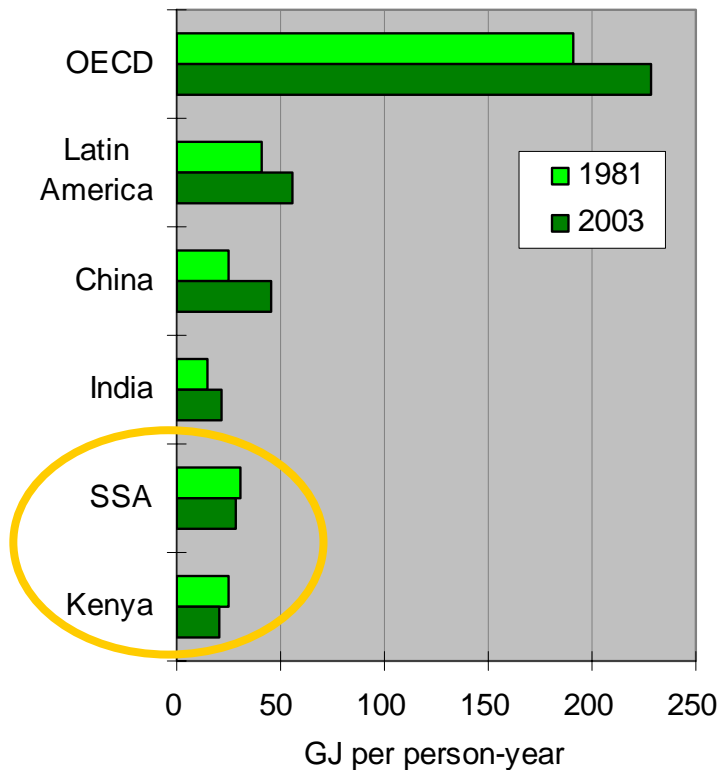
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HUMBOLDT STATE UNIVERSITY

The context: Kenya's energy economy

Change in per capita commercial energy consumption: 1981-2003



- Heavy dependence on woodfuels
 - Potentially unsustainable
- Low rates of access to electricity
- Decreasing per capita consumption
- Thriving solar-PV market
- Successful improved cookstoves of energy efficient cookstoves

Sustainability in Kenya's energy economy...

1) Woodfuels

2) Rural electrification

PV and DG

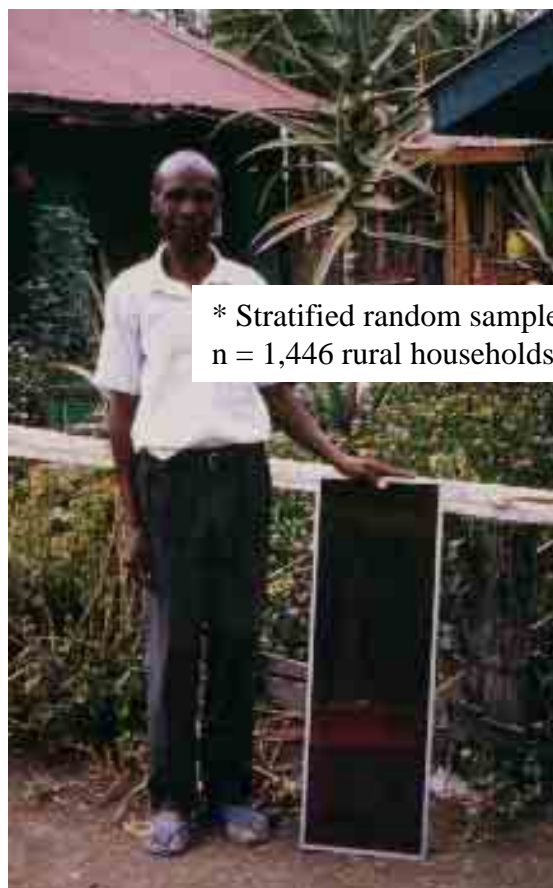
Wood energy provision - charcoal



Rural electrification - PV

Who uses PV?

What is PV used for?



* Stratified random sample,
n = 1,446 rural households



Rural electrification - DG

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Concluding thoughts

Woodfuels

- legal ambiguity must be reduced
 - legalization
 - regulation
- define responsibilities across gov't institutions

Power provision with PV and DG

- enable vertically integrated DG
- other incentives for private investment
- credit facilities for individuals, communities, & businesses

More data - a consistent data collections mechanism!

Rob Bailis

Assistant Professor

robert.bailis@yale.edu

Thank you!
Charles Kirubi

PhD student

kirubi@berkeley.edu

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arne@humboldt.edu

Location	Description of bribe
● Narok	4,000 paid to officers from the Forest Department ^a ; 1,000 paid to the NCC
● Seyabei	3,000 paid at checkpoint to the Kenya Police
● Eor Ekule	1,000 paid at checkpoint to the Kenya Police
● Ntulele	2,000 paid at checkpoint to the Kenya Police
● Niaregie Ngare	2,000 paid at checkpoint to the Kenya Police
● Duka Moja	4,000 paid to Administrative Police ^b
● Suswa	3,000 paid to NCC (this marks the border of Narok and Kajiado Districts)
● Suswa Ndogo	2,000 paid at checkpoint to the Kenya Police
● Mai Mahiu	1,000 paid at weigh station to the Kenya Police
● Muthigiti	1,000 paid at checkpoint to the Kenya Police
● Escarpment	2,000-6000 paid to CID officers in unmarked Land-rovers ^c
● Mutarakwa	1,000 paid at checkpoint to the Kenya Police
● Tigoni	2,000 paid at checkpoint to the Kenya Police
● Kiambaa	1,000 paid at checkpoint to the Kenya Police
● Nairobi	Occasional petty bribes (~200 KSH) paid to police in town
Total	30,000-34,000

Source: compiled from interviews with charcoal buyers and transporters conducted in Narok between January and February, 2005.

^a The Forest Department officer in charge of the district's forest guards – armed paramilitary personnel – was mentioned by name during interviews with charcoal buyers as an official who demands very high bribes. In addition, his name appears first on a list of “notorious timber and charcoal permit peddlers” that was published by a local community group and circulated as far as the County Council.

^b One set of informants explained that Administrative Police (APs) were the most feared of the authorities.

^c The CID's periodic presence on the road that ascends the escarpment between Mai Mahiu and Limuru was confirmed by several informants. The reason for their presence is unclear.

Benefits from the trade

Stage in the commodity chain	Distribution of benefits ^a	Percentage of retail price ^b
Farm-gate price: 110 KSh	→ 110 KSh → Farm-gate price (23%)	
	→ 98 KSh: charcoal maker's profits	21%
	→ 5 KSh: production costs (tools/shelter)	1%
	→ 5 KSh: payments to landowner ^c	1%
Increment added by transport: 242 KSh	→ 10 KSh → Broker in Narok	2%
	→ 102 KSh → Vehicle transport (22%)	
	→ 54 KSh: buyer/vehicle owner profits	11%
	→ 14 KSh: transport personnel	3%
	→ 34 KSh: fuel and vehicle maintenance	7%
	→ 120 KSh → Police, NCC and FD "profits"	26%
	→ 10 KSh → Brokers in Nairobi	2%
Increment added by retail sales: 120 KSh	→ 120 KSh → wholesale to retail markup (26%)	
	→ 67 KSh: vendor's profits	14%
	→ 53 KSh: vendors costs	11%

^a Solid arrows indicate profits that flow directly to individual actors; dashed arrows indicate flows of revenue that leave the commodity chain and enter into circulation in the economy. This assumes that the average 35kg bag of Narok charcoal is sold for 470 KSh in Nairobi, which accounts for the ~20% markup charged when charcoal bags are broken down into smaller units of sale.

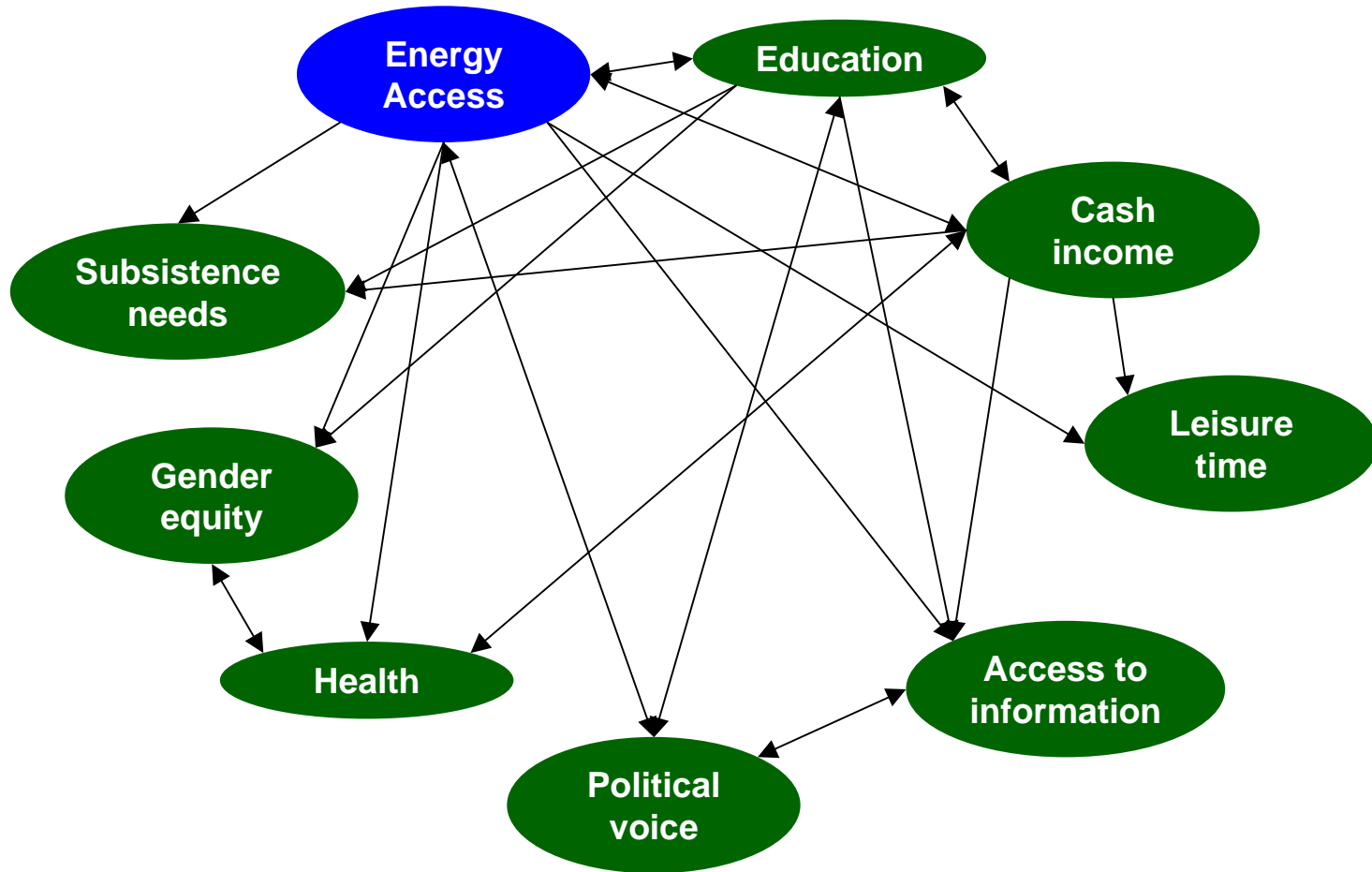
^b Percentages do not add to 100% because of rounding errors.

^c The landowner also receives benefits roughly equivalent to 24 KSh per bag (5% of the retail price) in the form of cleared land, but this is omitted from the figure because it is not monetized and does not contribute to charcoal's price formation.

Benefits from the trade

Stage in the chain	Actors	Estimated no. of actors	Profits per bag (KSh)	Total profits for group (10 ⁶ KSh/yr)	Average individual profits ^a	
					(KSh/year)	relative to producer (%)
Production	Landowners	1,600	29	58	40,000	53%
	Producers	2,900	98	196	70,000	100%
Transport	Brokers in Narok	250	10	20	80,000	120%
	Buyers owning transport	40	54	108	3,000,000	4,000%
	Buyers hiring transport	50	22	44	900,000	1,300%
	Vehicle owners	50	32	64	1,000,000	1,900%
	Other transport workers	270	14	28	100,000	150%
	Police and other officials	230	120	240	1,000,000	1,500%
Sales	Brokers in Nairobi	250	10	20	80,000	120%
	Vendors	3,400	53	106	30,000	48%

Energy, well-being, and sustainability



Distribution of benefits from charcoal made in Narok and sold in Nairobi

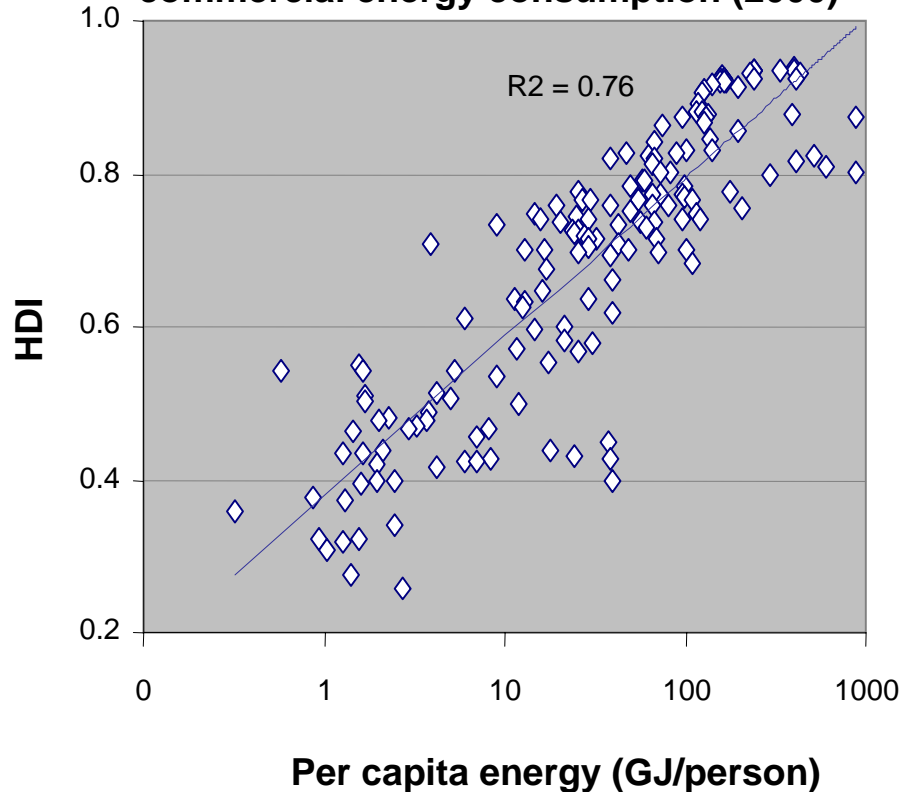


Profits from each bag

Landowners	0-3%	←
Charcoal makers	~20%	←
Local brokers	~2%	
Local gov't	~3%	
Transporters	~16%	←
Buyers	8-18%	←
Police (bribes).....	20-30%	←
Nairobi brokers.....	~2%	
Vendors.....	~20%	
Government of Kenya.....	0%	←

Energy, well-being, and sustainability

Human Development Index (HDI) and per capita commercial energy consumption (2000)



Source: IEA and UNDP

Energy Access



Subsistence needs

Income

Health

Education

Gender equity

Leisure time

Access to information

Political voice

Energy is necessary, but not sufficient...