A close-up photograph of a charcoal kiln. The kiln is a large, cylindrical structure made of woven branches and sticks. The interior is filled with a mixture of raw wood logs and dark, charred charcoal. The lighting is bright, highlighting the textures of the wood and the charcoal.

# **Charcoal production, poverty alleviation and woodland change in the Kapiri Mposhi District of Zambia**

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THINKING beyond the canopy



# Outline

1. Charcoal in Zambia: An overview
2. Propositions
3. Brief intro of Kapiri Mposhi District
4. Charcoal and poverty alleviation
5. Impact of charcoal on the woodlands
6. Towards an integrated land use

# Charcoal production and Zambia's Miombo (1/2)

- Produced across the country with a value of xx/per annum
- Urban consumption drives demand
  - Lusaka's consumption rate stands at 1.3 tonnes/hh/year
- Critical contribution to rural livelihoods:
  - Safety net
  - Key income sources
- Economic contribution: 2.2 % to GDP

# Charcoal production and Zambia's Miombo (2/2)

- Employment: estimated to be 500,000 (2009)
- Contributes to the loss 73,000 ha per year (24.5% of Zambia's 0.3% national rate of forest loss)
- Increasing future demand
  - Off the shelf technological innovations
    - Efficient production systems e.g., kilns
  - Policy innovations for SFM

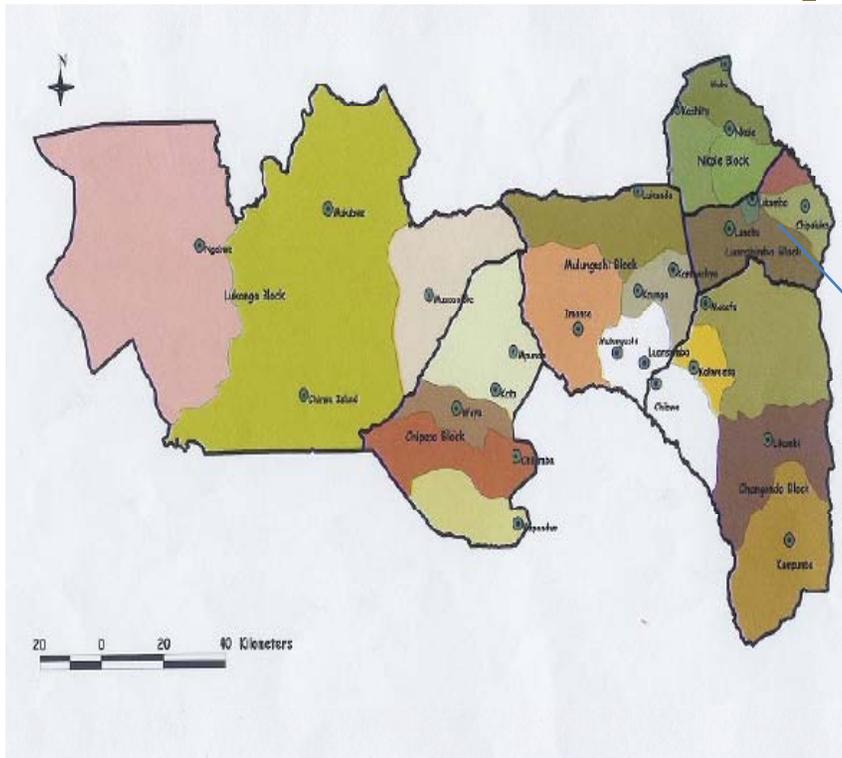
# Propositions

- 1) That sustainable charcoal production can increase the incomes of poor households and lift them out of poverty
- 2) That the miombo woodlands of the Kapiri Mposhi District are changing due to a multiplicity of factors and not CHARCOAL production alone
- 3) That an integrated land use approach would provide a basket of benefits and incentives, including charcoaling that would benefit the woodlands, individual households and the community

# Introducing Kapiri Mposhi District

- Located in the central province of Zambia; 45,000 million ha
- Population of 305,751, growing at 5.8% per annum
- Main crops: Maize, cotton, tobacco
- Key NTFPs: Charcoal, honey, mushrooms
- Customary land – some areas formerly resettlement with minimums of 13 ha per HH

# Lunchu A: Kapiri Mposhi District



# Charcoal and poverty alleviation

- SNDP(2010 to 2015) recognizes that poverty remains are an issue across the country
- Incidences of poverty at 67 percent with extreme poverty at 46 percent.
- “Basket of needs” approach established poverty lines

Level	Zambia Kwacha/month
National	K433,624 (\$94.3) (CSO 2004)
Provincial (Central)	K413,841 (\$90.0) (P
District	K323,812 (\$70.4)
Lunchu (Study site)	K296,068 (\$64.4) (N=150)

USD1=K4,600

# Income contribution of HH charcoal production and trade (1/2)

- 59 households deriving income from charcoal marketed K33.2 million (\$7,214.7)
- Individual HH earned K46,875 (\$10.20)/month based farm gate prices:
  - 15.8% of hh income for rural households in general and 20.5% for extremely poor households
- Poverty gap for central province is K122,083 (\$26.5)/month and returns from charcoal in Lunchu were K46,875 (\$10.20) /hh/month

# Income contribution of HH charcoal production and trade (1/2)

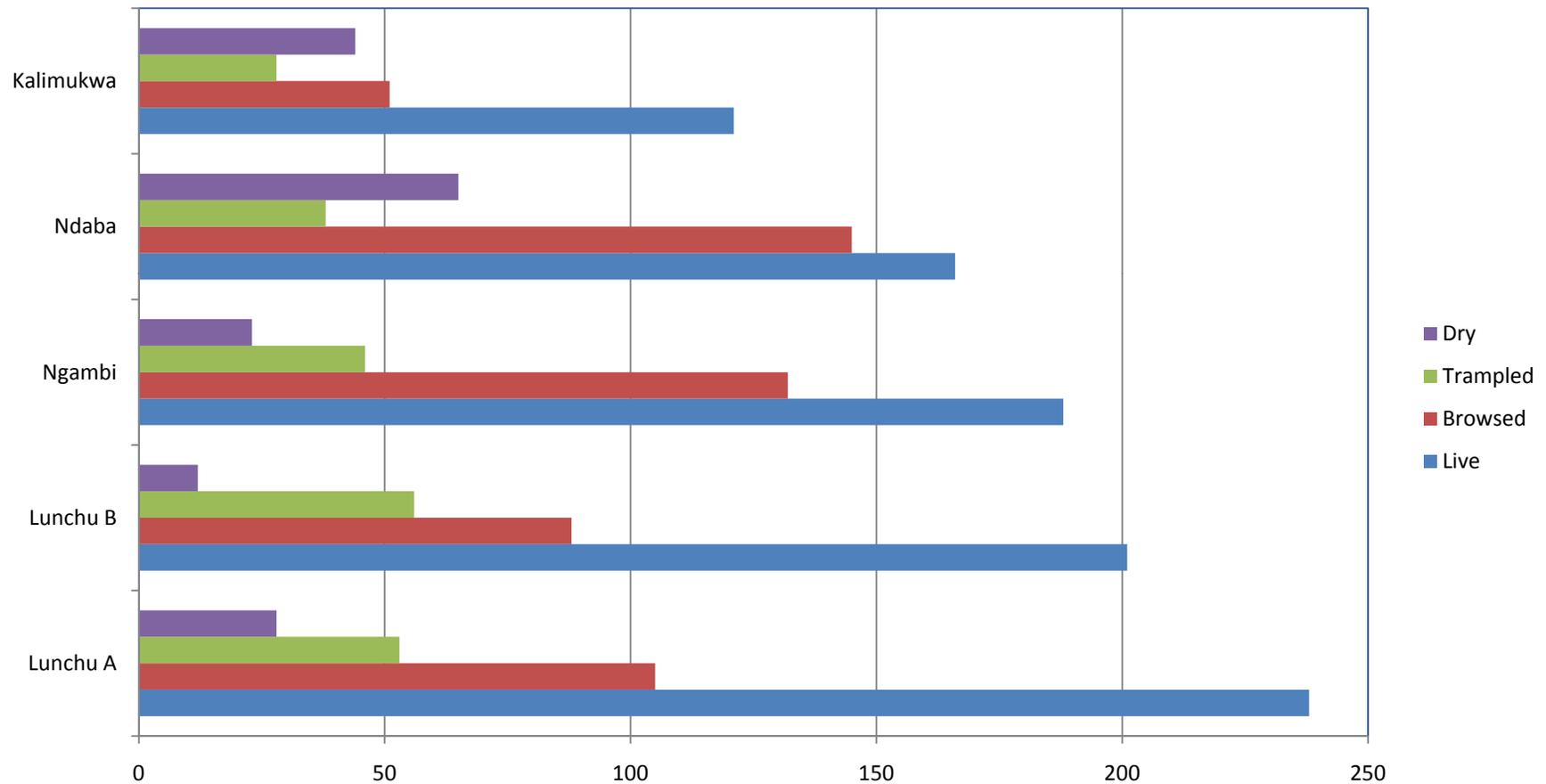
- 4% of the charcoal remains at the kiln as residuals
- Address issues of illegality and inadequate monitoring
- Five options to move to the PL:
  - Increase the amount of charcoal produced three fold
  - Play a greater role in the charcoal value chain
  - Increase efficiency in production
  - Adopt sustainable charcoal approaches
  - Policy intervention

# Impacts of charcoal production on the woodlands



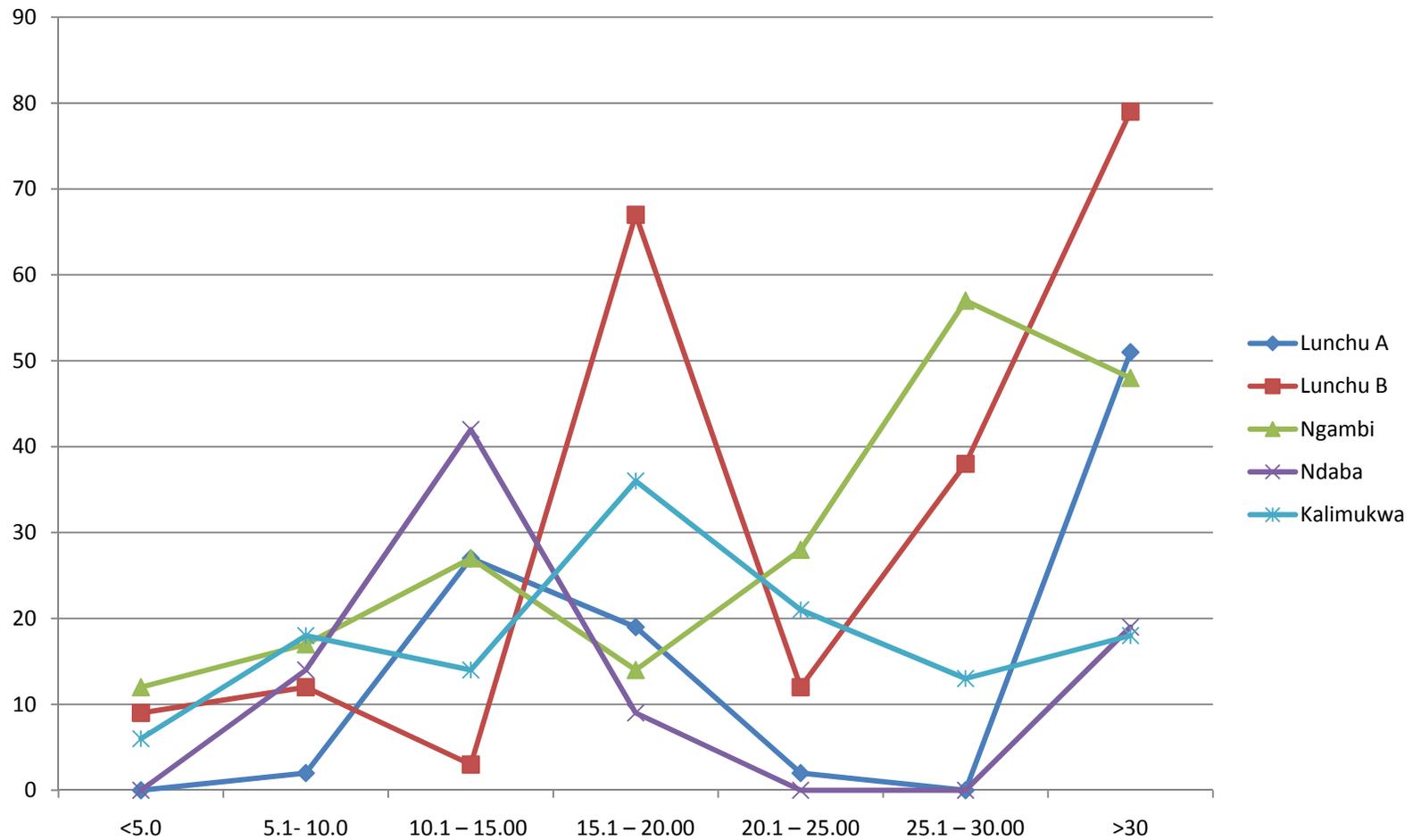
- Current rates of deforestation across Zambia is 0.3% per annum
- Agricultural expansion, firewood, infrastructure development. Urbanization etc
- Charcoal production estimated to be contributing 25% to Zambia's rate of deforestation
- Miombo woodland recovers after charcoaling through natural regeneration, coppice shoots etc

# Status of seedlings

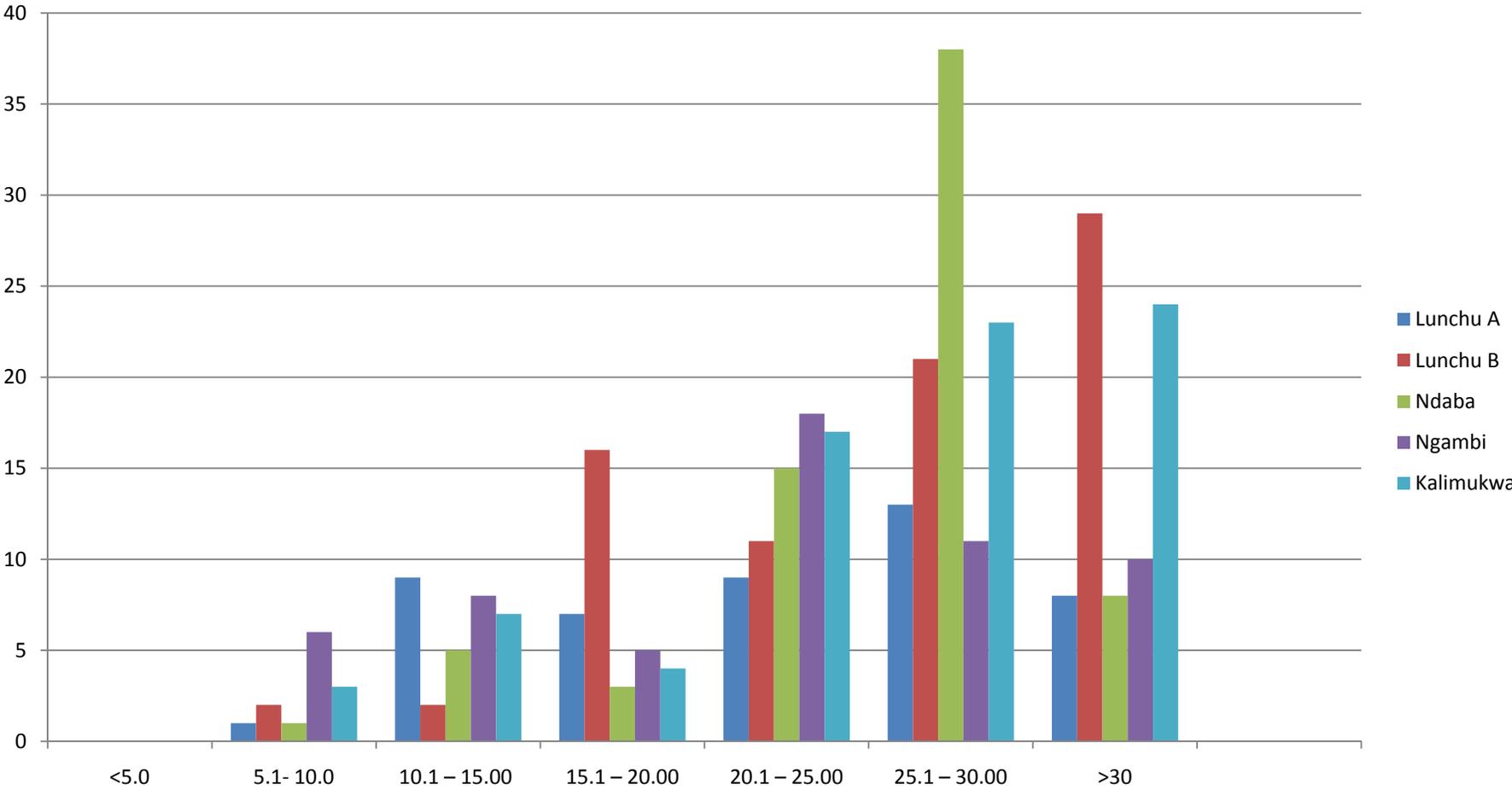


Number and status of seedlings by area (N=145)

# Coppice shoots (N=145)



# Stumps



Stumps by stem diameter classes

# Similarities in species among the villages

## Diversity Indices by Villages

Indices	Villages				
	Lunchu A	Lunchu B	Ndaba	Ngambi	Kalimukwa
Species richness (N)	43	53	46	48	57
Shannon Weiner (H)	0.98	0.99	0.96	1.1	0.69
Evenness (E)	0.97	0.95	0.89	0.82	0.93

# Additional Comparison

## Sorensen's Coefficient of Community

Village	Lunchu A	Lunchu B	Ndaba	Ngmbi	Kalimukwa
Lunchu A	0	0.77	0.76	0.68	0.80
Lunchu B		0	0.87	0.87	0.72
Ndaba			0	0.68	0.70
Ngambi				0	0.63

- Also used were the Kruskal Wallis and the Mann Whitney Tests

# Woodland change

- Charcoal production necessarily leads to resource degradation
- **Regeneration maybe limited by fire, water, and moisture stress, sunlight, seed regeneration, management**
- **Proximate and underlying causes driving woodland change in a given location must be understood**

# Towards the promotion of integrated Land use and charcoal (1/2)

- Should charcoal production be stopped?

- Sustainable charcoal production been presented as a way forward



- Cannot happen on its own – competes for tree resources with
  - Timber and poles
  - Firewood
  - Harvesting of some NTFPs
  - Carbon!
- Create a basket of benefits and incentives

# Towards the promotion of integrated Land use and charcoal (2/2)

- Land use plan must allow for controlled deforestation for socio-economic development
- Roles of local-level institutions re: regulating access, management, marketing and benefit sharing clear
- The role of public forestry institutions, regulators and bureaucrats
  - Monitoring and law enforcement
- Research and knowledge gaps

Thank you for listening