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Social and Environmental Trade-Offs
in African Agriculture

Analyzing trade-offs in land use decision making using AHP– insights from a Zambian case study

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Zambian case study: Preliminary Insights

- Study sample: Aragic land managers (Farmers)- Distinct ownership models)
 - Private owned (small, medium & large scale)
 - State owned
 - NGO owned
 - Shareholder owned
 - Collectively owned
- Sample size: 17
- Study sites: Mkushi, Chongwe, Katete & Chipata districts
- Sampling technique: Purposive sampling
- Data collection method: Interviews/Desk research
- Pre-field work: October 2021
- Data collection period- Interviews: December 2021
- Methodology: AHP



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Findings...

Factors (Domains) considered in agricultural land expansion decision making

- Financial factors
- Market factors
- Environmental factors
- Social well-being factors
- Regulations factors
- Knowledge base factors

Renwick et al 2019; Journeaux et al 2017; Petrini et al 2018; Kasem & Thapa 2011



Image source: Canstockphoto.com

Diversity of Sub-factors (domains) considers across all ownership models

Financial sub-factors

- Capital investment (availability of capital/credit)
- Return on investment/profitability
- Payback period
- Variability n profit
- Subsidies for production
- Guarantee of minimum price
- Income diversification

Market sub-factors

- Scale of market
- Availability of market
- Strength of the supply chain
- Availability of labour

Regulation sub-factors

- Regulations on water abstraction
- Regulations on food safety
- Regulations on permissible crops for cultivation
- Regulations on health safety of employees
- Regulations on changing land use

Social wellbeing sub-factors

- Improving quality of life
- Local employment
- Contribution to food security/nutrition
- Reducing theft levels through improving local economy

Knowledge base sub-factors

- Current state of knowledge (own & generally)
- State of technology/tools/machinery
- Availability of diverse expertise/capacities
- Availability of advisory support (extension services)
- Level of confidence

Environmental sub-factors

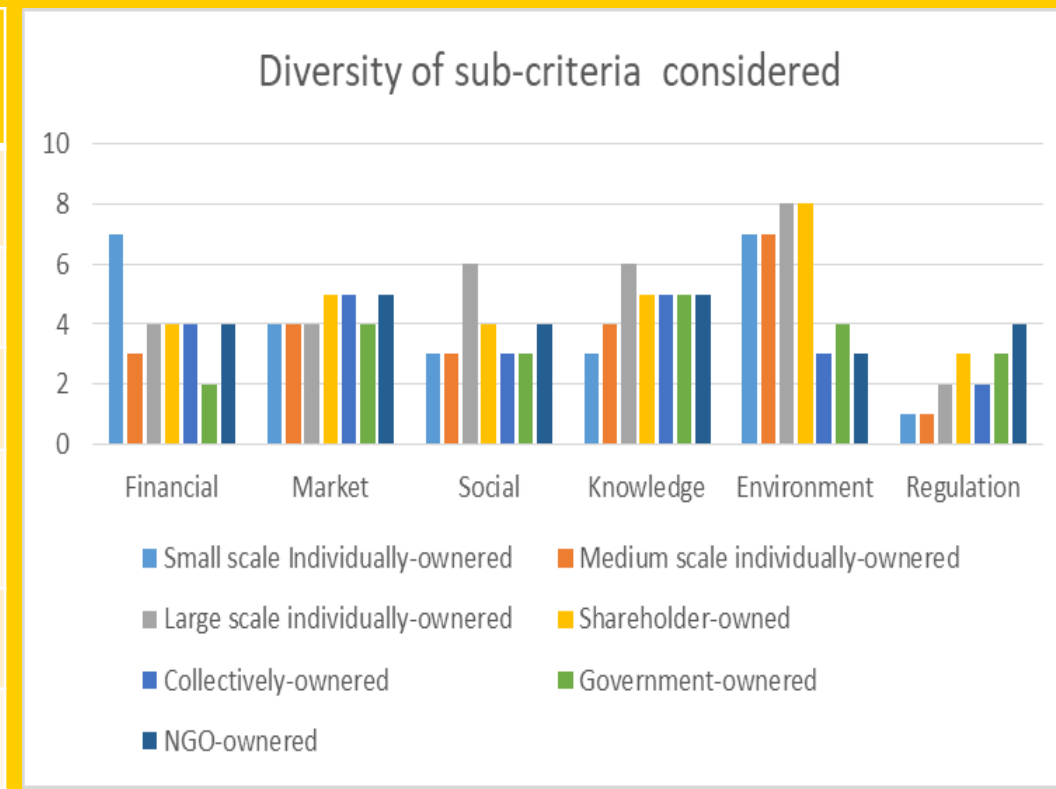
- Environmental stewardship
 - Crop rotation
 - Tree planting
 - No burning crop residues on-site
 - Use of manure /sun hem/lime
- Environmental impacts
 - Soil erosion due to loss of tress
 - Loss of wind breakers due to loss of tress

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Diversity of sub-domains considered by each category of ownership model

	Small scale	Medium scale	Large scale	Shareholder	Collectively	Govt	NGO
Financial	7	3	4	4	4	2	4
Market	4	4	4	5	5	4	5
Social	3	3	6	4	3	3	4
Knowledge base	3	4	6	5	5	5	5
Environment	7	7	8	8	3	4	3
Regulation	1	1	2	3	2	3	4



Summary statistics from Analytic Hierarchy Process (AHP)

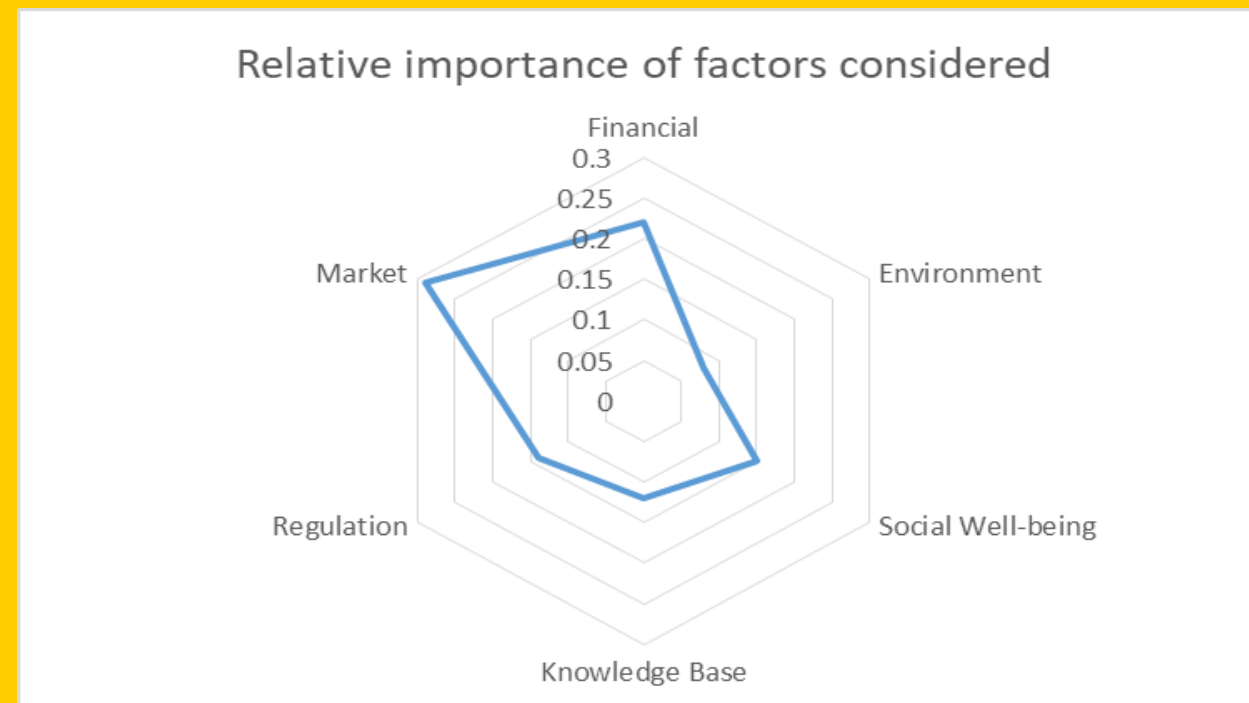
Domain (Criteria)	Mean	SD	Range	Max	Min
Financial	0.22	0.05	0.17	0.28	0.11
Environment	0.08	0.07	0.21	0.25	0.06
Social well-being	0.15	0.05	0.16	0.25	0.09
Knowledge base	0.12	0.02	0.07	0.15	0.08
Regulation	0.14	0.08	0.18	0.24	0.06
Market	0.20	0.12	0.35	0.42	0.07

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Relative importance of factors considered across all categories of ownership models

Domain	Mean score
Financial	0.22
Environment	0.08
Social well-being	0.15
Knowledge base	0.12
Regulation	0.14
Market	0.29



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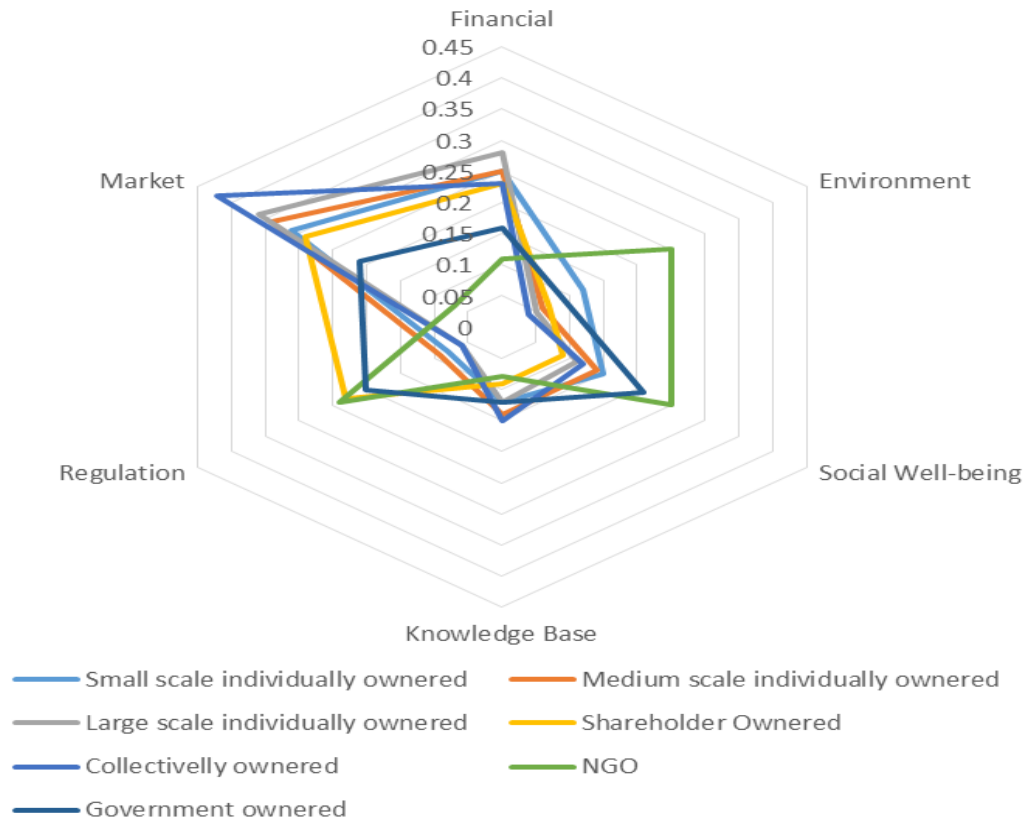
Relative importance of factors considered by ownership models

Ownership/ Domain	Financial	Environment	Social well-being	Knowledge base	Regulations	Market
Small scale	0.25	0.12	0.15	0.12	0.08	0.31
Medium scale	0.25	0.06	0.14	0.14	0.09	0.34
Large scale	0.28	0.05	0.11	0.12	0.06	0.36
Shareholder	0.23	0.07	0.09	0.09	0.23	0.29
Collectively	0.23	0.04	0.12	0.15	0.06	0.42
NGO	0.11	0.25	0.25	0.08	0.24	0.07
Government	0.16	0.09	0.21	0.12	0.20	0.21

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Relative importance of factors (domains) considered
cross all ownership models



- Insights to support quantitative results for the market factor (domain)
 - “...if there is no where to sell the produce then no need to expand crop production...”
 - “We first need to have market for our produce before we think of whether we will make profits...”
 - “Market comes first before anything after that then issues of profits come next...”

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Highlights from findings/conclusions...

- Similarity in the sub-domains considered across most ownership model
- Overall, market domain had more influence in the decision making process seconded by financial domain
- Regulation domain had less influence for private (at all scales) and collectively ownership model
- Social well-being domain had more influence for NGO and Govt ownership models
- Environmental domain had less important cross most ownership models
- NGO owned placed more importance on the environmental domain
- Opportunities to influence and incentivize better management of social and environmental impacts of agriculture expansion prompts attend to the needs and priorities of agricultural land managers characterized by varied ownership models

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