Trends and determinants of change in rice-based production systems in the Zambezi floodplain in Zambia

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Introduction

Demand for rice is rapidly increasing in Zambia. Rice is mainly grown in wetland ecosystems. The Zambezi floodplain has high potential for production. Agricultural policy seeks to strengthen rice production.

The National Rice Development Strategy aims at:

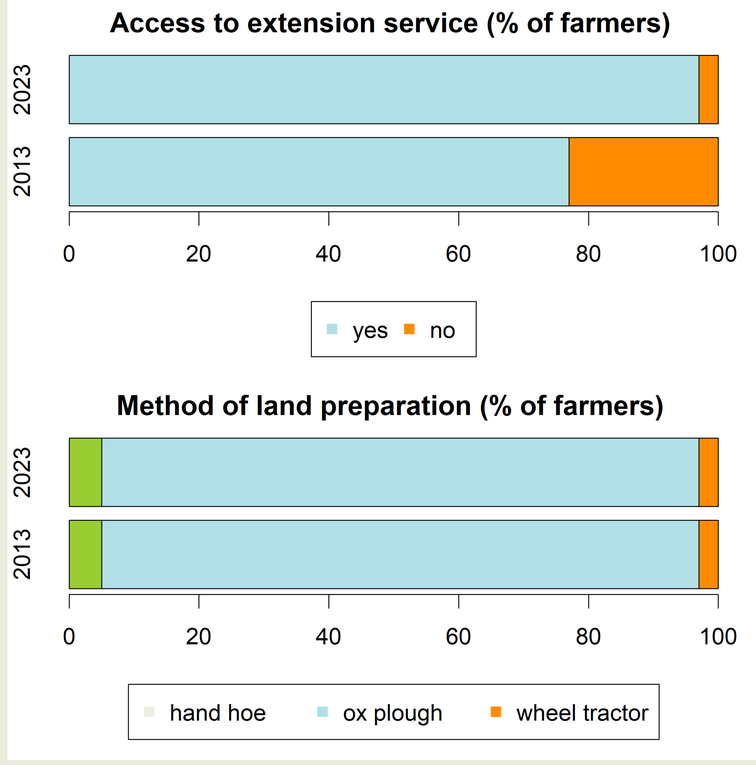
i. Increasing local rice yields
ii. Expansion of cultivated area
iii. Promoting agricultural innovations

Research Questions

i. Are rice farmers differently affected by hydrological conditions?
ii. What are current yields and recent change trends in agronomic practices?
iii. What are likely drivers of change in the rice-based cropping systems?

Stratification of hydrological conditions in the Zambezi floodplain: A) irrigated, B) flood-prone, C) favorable, and D) drought-prone zones

Access to extension and machinery

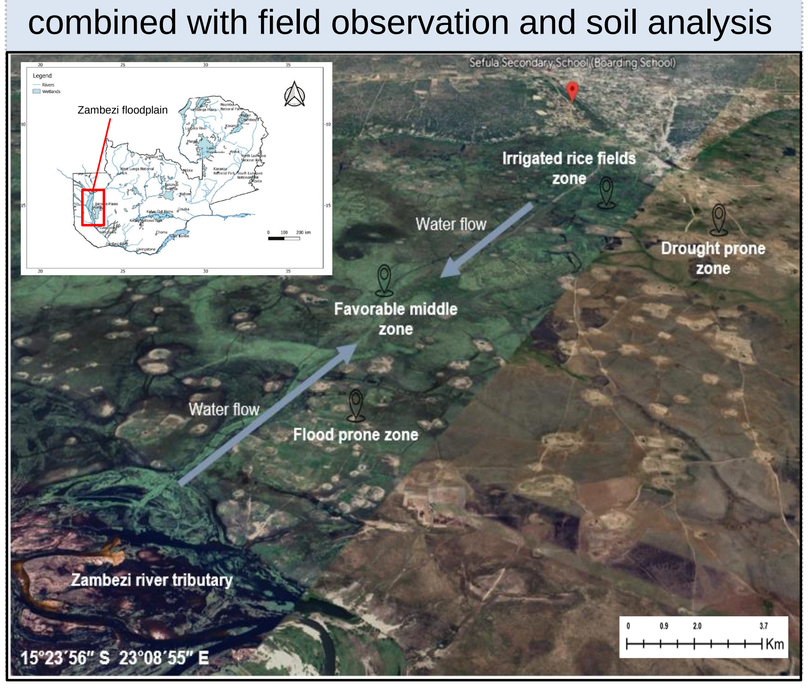


Farmers have access to extension, while access to machinery is very low (ox-drawn plough for tillage and manual harvest)

Materials and methods

40 farms stratified based on the hydrological gradient

Diachronic household survey (2013 vs. 2023) combined with field observation and soil analysis



Conclusion

Hydro-edaphic conditions differ between field locations

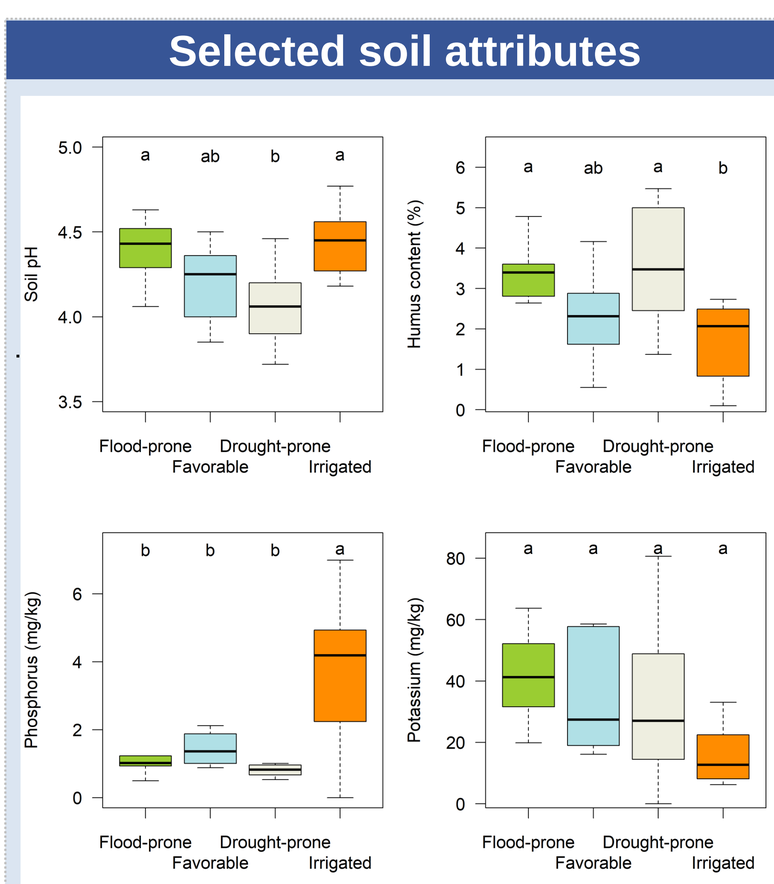
Rice grain yields remain variable and relatively low

Yields were highest in favorable rainfed and irrigated systems

Despite recently improved extension, no major adoption of improved agronomic practices observed

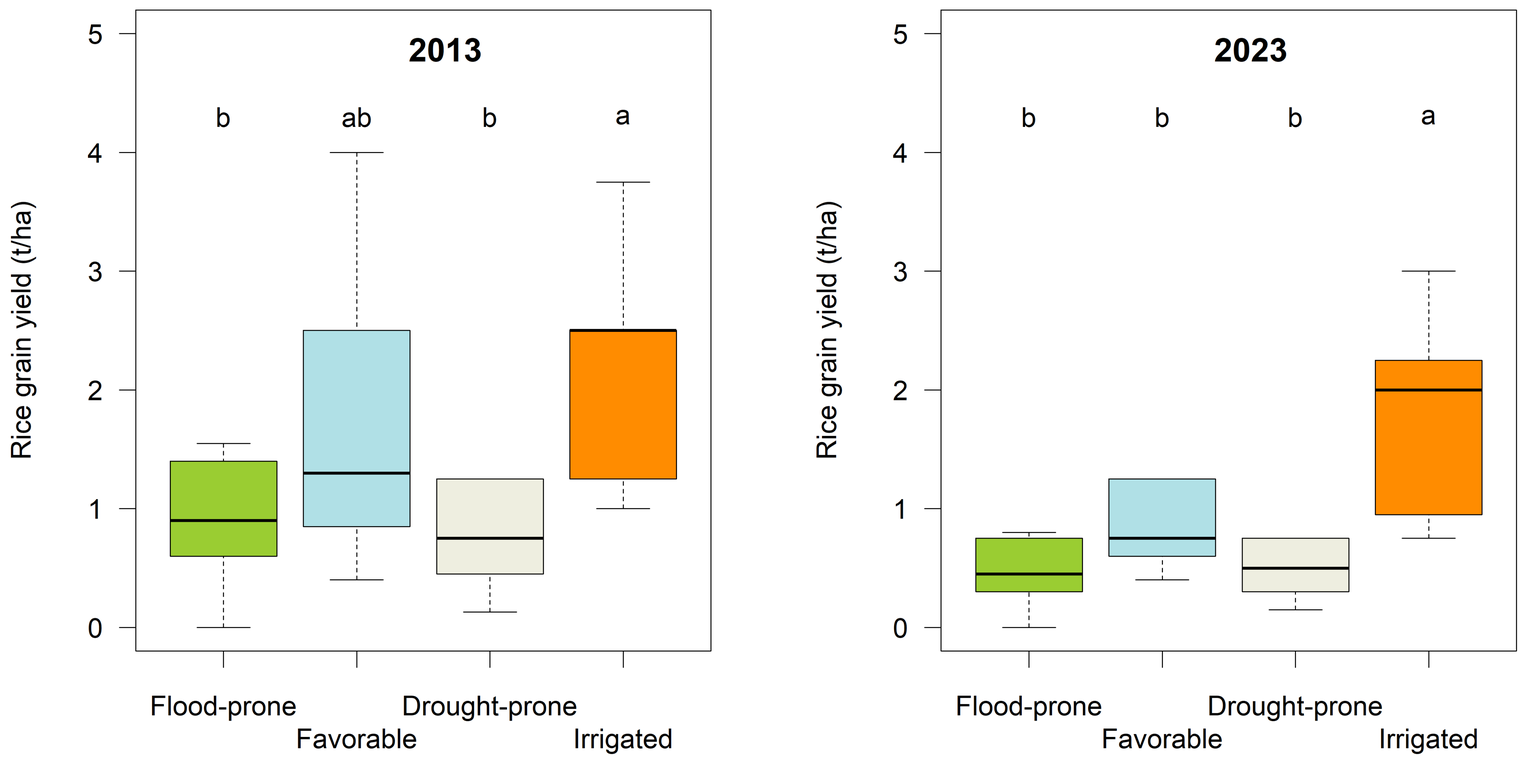
Increasing yields require improved acccess to fertilizers, machinery and irrigation infrastructure

Selected soil attributes



Soil pH, Organic matter, P, and K contents along the hydrological gradient

Rice Grain Yield



Rice yields and their variability in different hydrological conditions and years (2013 vs. 2023) in Zambezi floodplain

Farmer´s aspiration

Farmers highlight the following future needs to improve rice production:

- Provision of microfinance
- Improved irrigation infrastructure
- Availability of fertilizers and machinery
- Links to markets with good pricing

Rice yields (t/ha) in Zambia compared neighboring countries

Country	2009	2011	2013
Malawi	2.13	1.91	1.92
Mozambique	0.98	1.14	1.17
South Africa	2.72	2.50	2.61
Zambia	1.64	1.80	1.16
Zimbabwe	2.19	2.09	2.26

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