

**Responses to dynamics in the  
ecosystem service provision in  
semi-arid Bobirwa sub-district,  
Limpopo Basin part of  
Botswana**

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5<sup>th</sup> INTERNATIONAL CLIMATE CHANGE ADAPTATION CONFERENCE  
(AF18)

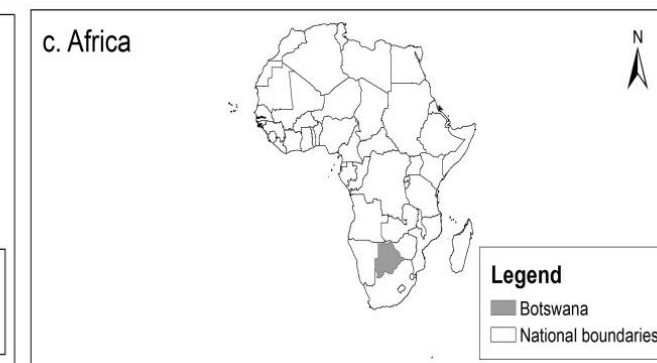
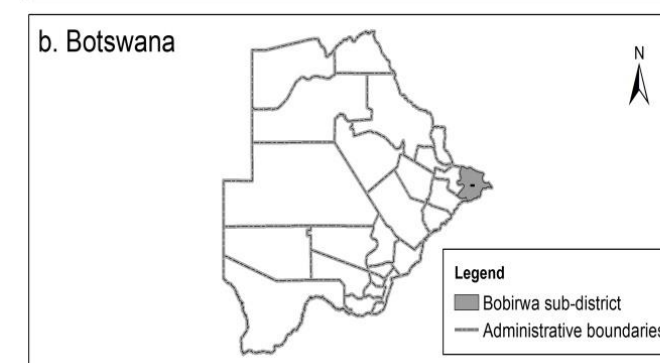
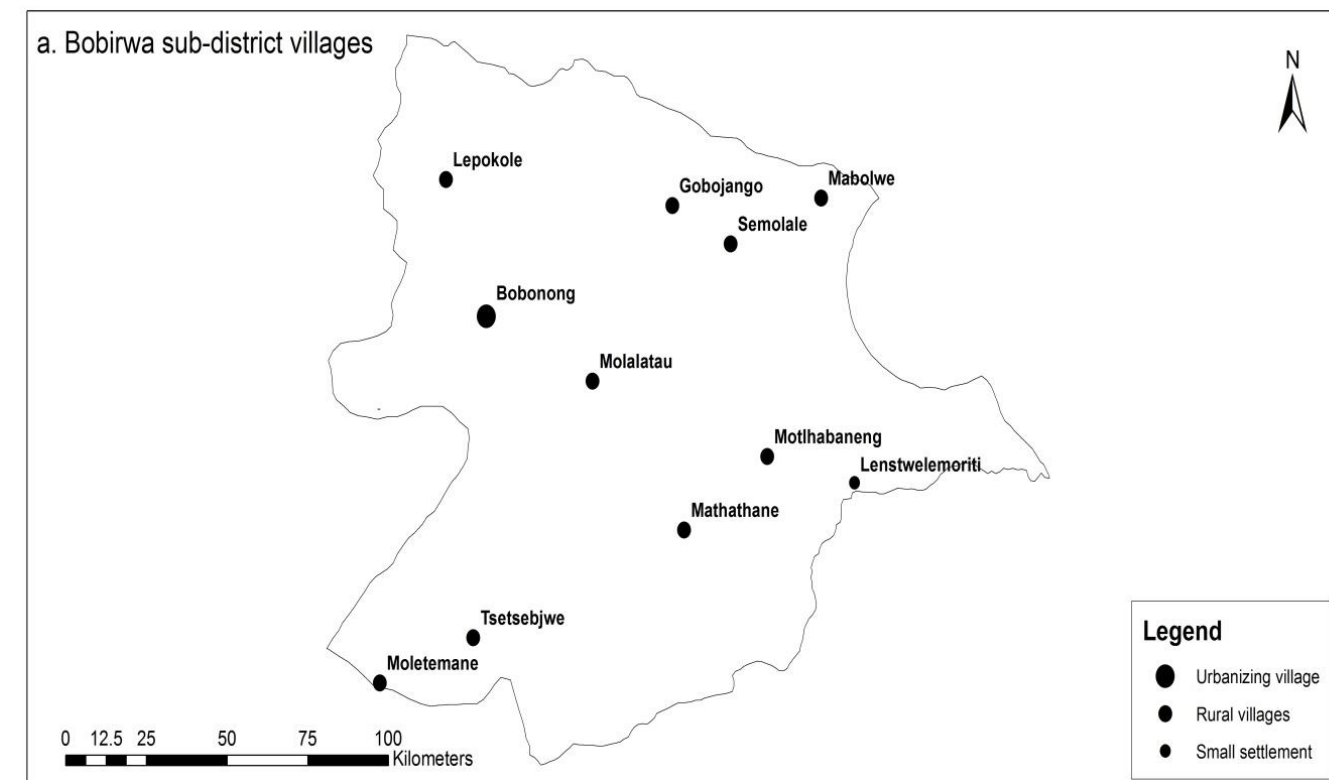
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# Study area

## Location map of Bobirwa, Limpopo Basin part of Botswana

- Located **21°58'14"S** and **28°25'24"E**
- 7 543.67 sqr. kms in land size
- Elevation: 590-886m
- Semi-arid hot spot
  - Mean annual rainfall: 300-400 mm
  - Mean annual temperature: >22°C
- 8 villages used for this study
- Growing evidence of ecosystem deterioration and degradation



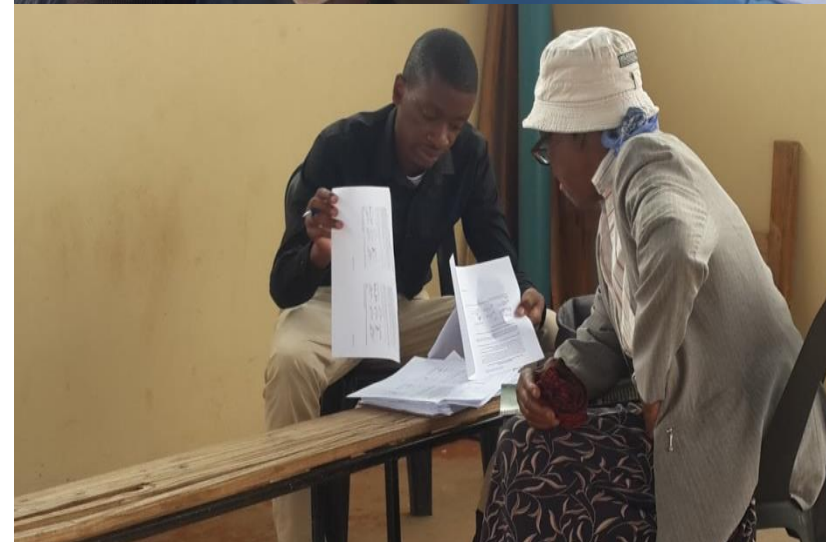
# Background

In Bobirwa sub-district, and Botswana in general, small holder farming (crop & livestock production) and exploitation of the natural environment remain the most dominant livelihood activities among the rural people, and significantly contribute towards employment, food and income for many households ( UNDP-UNEP PEI, 2013).



# Objectives & Methodology

- We aimed to understand;
  - how shifts in the delivery of provisioning ES affects livelihoods of semi-arid communities and;
  - understand how the local communities are responding to these shifts in ES
- Participatory mapping exercises, one-on-one interviews and field visits were conducted in 8 villages between 2016 and 2018.

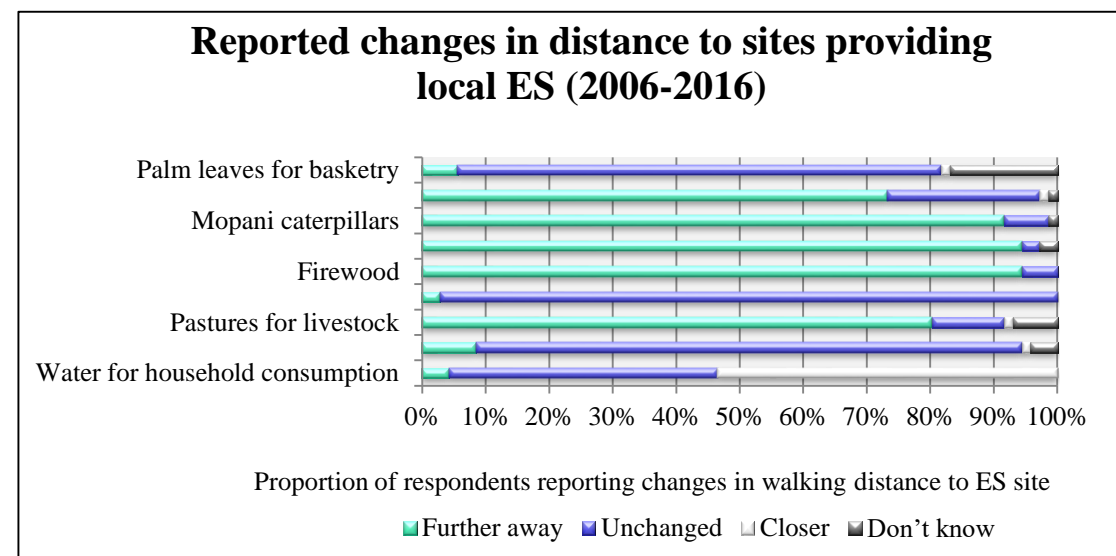
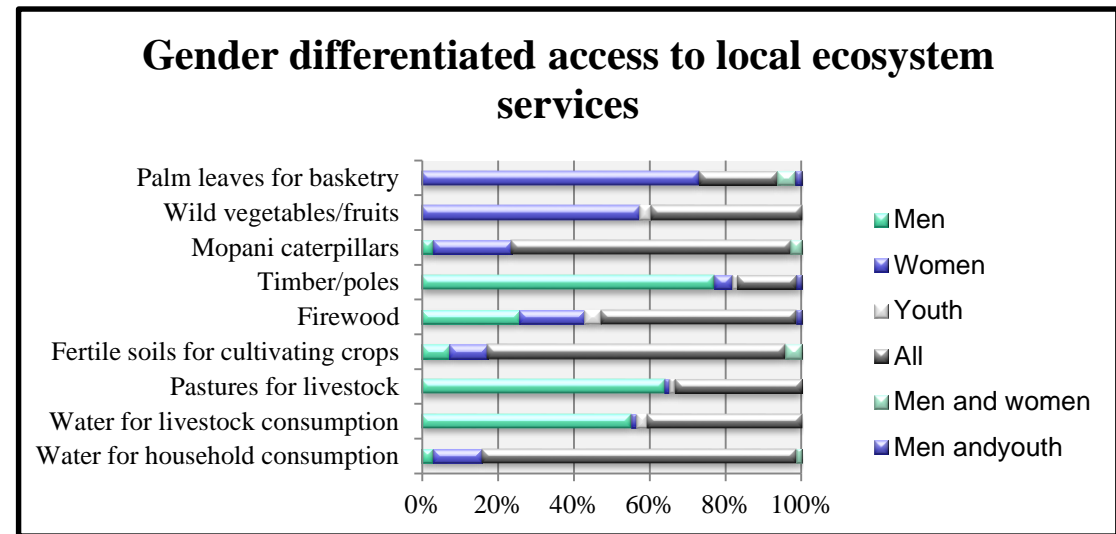
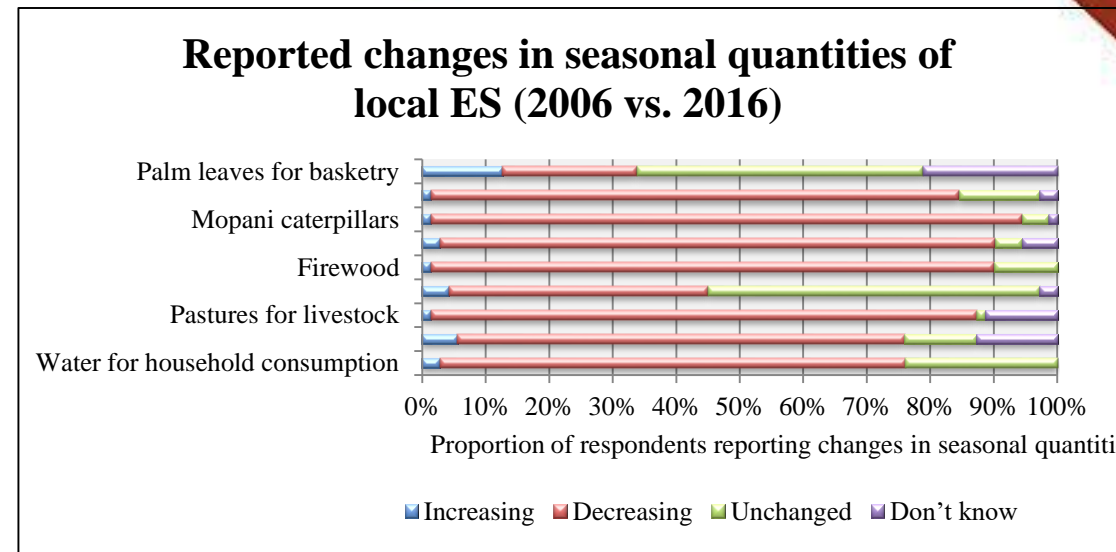


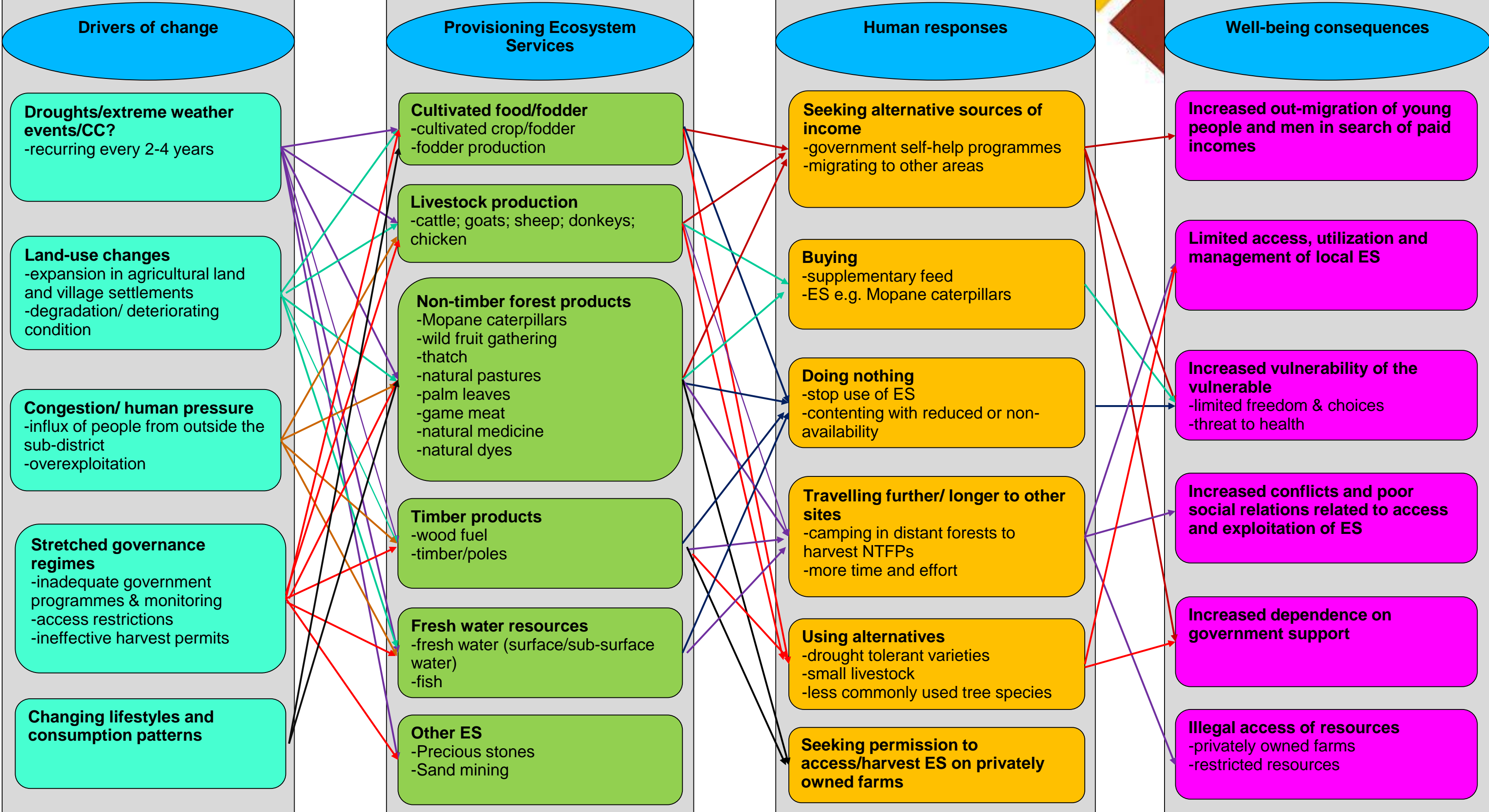
*Photo credit: Ephias Mugari (2016)*

# Findings

Changes in ecosystems in Bobirwa sub-district over the past decade can be summarized by these trends:

- Adverse impacts of climate and weather variability e.g. frequent droughts;
- Increased demand of agricultural land and other forest resources leading to land-use changes and over exploitation
- Degradation of the natural environment leading to declining ecosystem capacity





Linkages between drivers of change, provisioning ecosystem services, human responses and well-being consequences

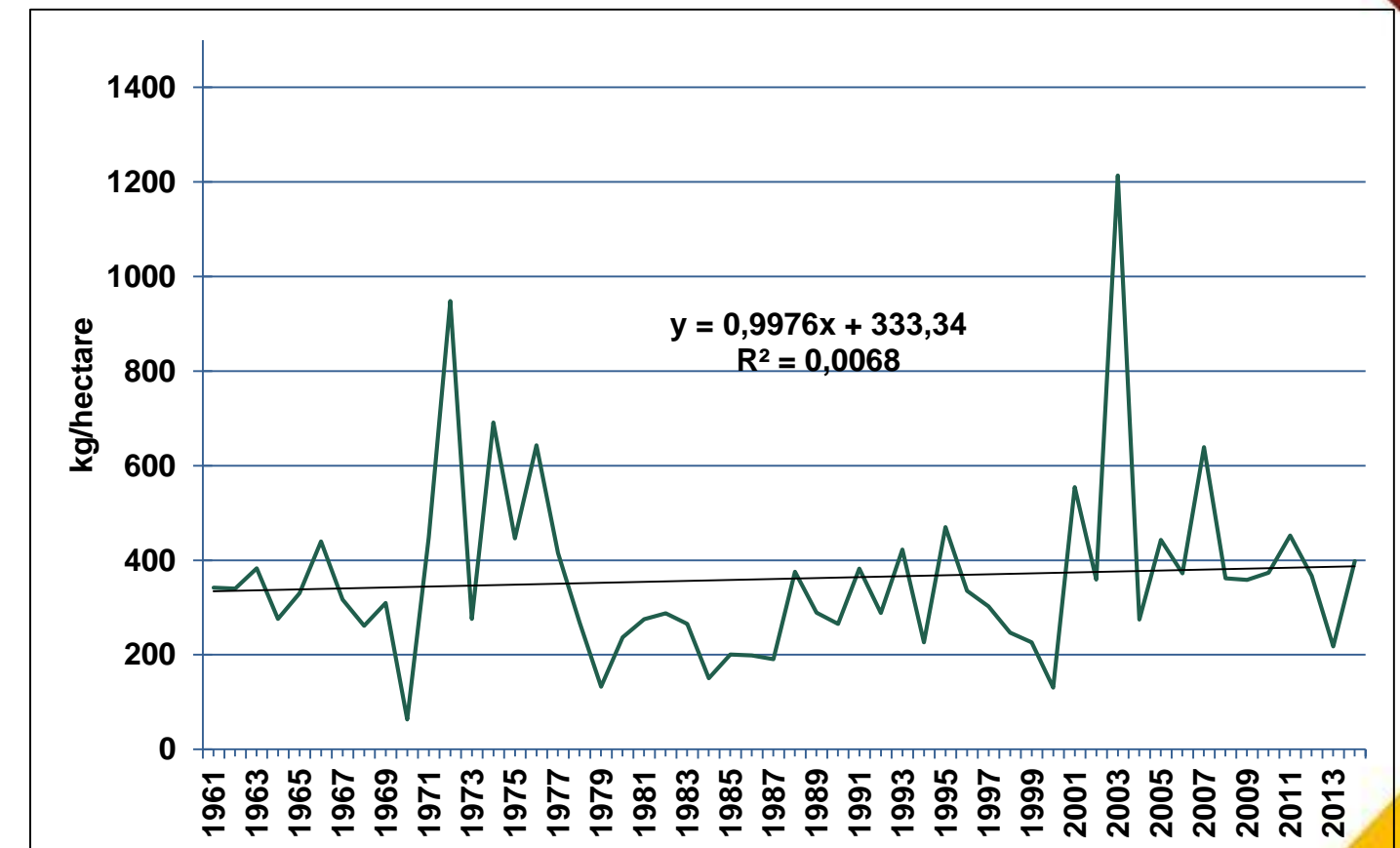
# Example 1: Integrated Support Programme for Arable Agricultural Development (ISPAAAD)

- initiated in 2008 to increase grain production; promote food security; commercialize agriculture through mechanization, facilitating access to farm inputs and credit, and improving extension outreach.

## Essential inputs;

- Free OPV of major seeds to plant up to 16 ha,
- Free fertilizer up to 5ha at a rate of 200kg/ha,
- Free draught power and associated implements –free ploughing, harrowing and row planting up to 5ha and 50% subsidy for 6-16ha
- Ploughing-BWP400/ha; Minimum tillage-BWP350/ha; Harrowing-BWP150/ha; Row planting- BWP150/ha.
- Access to credit, cluster fencing, potable water and agricultural services

Botswana cereal yield 1961-2014



Source: Statistics Botswana (2016)

## Example 2: Government assistance of Mopane caterpillar harvesters (Poverty Eradication Programme)

- Govt. assists with food baskets, transport costs and harvesting materials to harvest Mopane caterpillars (*Imbrasia belina*)
- Absence of sanitation facilities at camping sites resulting in conflicts with livestock farmers-disease transmission
- Harsh conditions and weather pose health risks especially to young children and women



Photo credit: Unknown



Photo credit: Unknown



# Conclusion

- Current individual responses are reactive, haphazard and unsustainable in the long term (creating several adverse trade-offs)
- Although targeted at the poor, government assistance has been less effective and suffers from unintended leakages
- Seed and fertilizer distribution and the promotion and use of appropriate tilling techniques and farming systems need to be tuned to land suitability conditions and relevant characteristics of agro-ecological zones
- However, if re-designed government assistance programmes have potential to effectively support local communities adapt hence contribute towards rural development including the aspirations of female-headed households, and help eradicate poverty and improve well-being

# Key message

- Government support of local adaptation initiatives need to understand the local context, aspirations of the local communities and also to embrace the bottom-up approach to be effective as adaptation is much about the people as it is about the improved seeds, provision of free tillage and other types of assistance

# Thank you

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