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The U.S. Government's Global Hunger & Food Security Initiative

Suitability, sustainability and resilience: case study from Mali on vegetables and vegetable seed

Texas A & M University

Innovation Lab for Small Scale Irrigation (ILSSI) Symposium – 1st March 2023

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BACKGROUND

Growing demand for fresh vegetables in Mali

Smallholder farmers are responding to demand with irrigated dry season and year round production

Increasing farmer investment in new technologies and adoption of farming practices to increase yields and improve quality

Source: FAO, 2019

STUDY OBJECTIVES

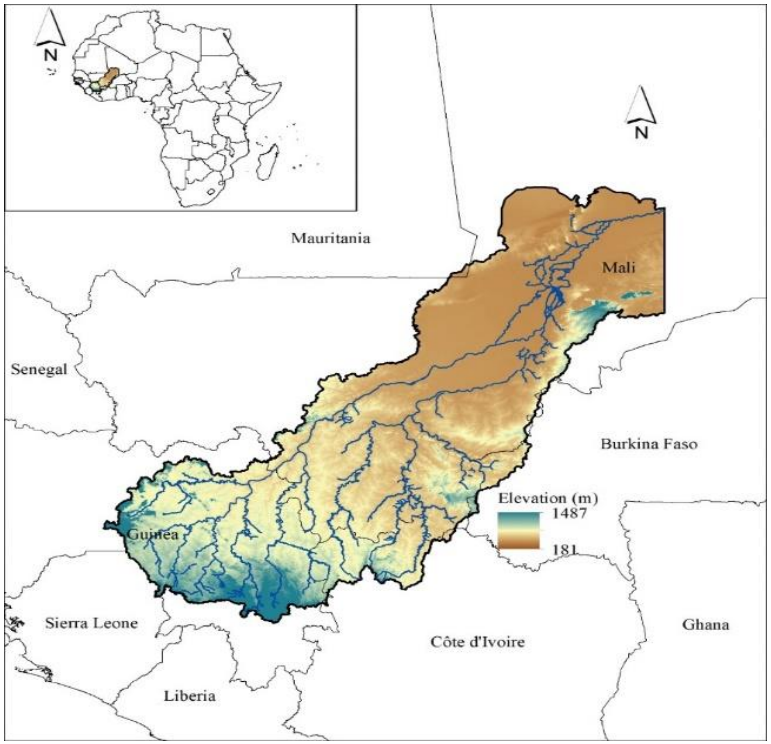
Providing information for USAID-supported project in Mali:

- Assess land suitability for dry season vegetable/vegetable seed (okra, tomato, shallot, chili and melon)
- Evaluate impacts of conservation agriculture practices

STUDY AREA

1. Land suitability assessment using a GIS-Multi-Criteria Evaluation (MCE)

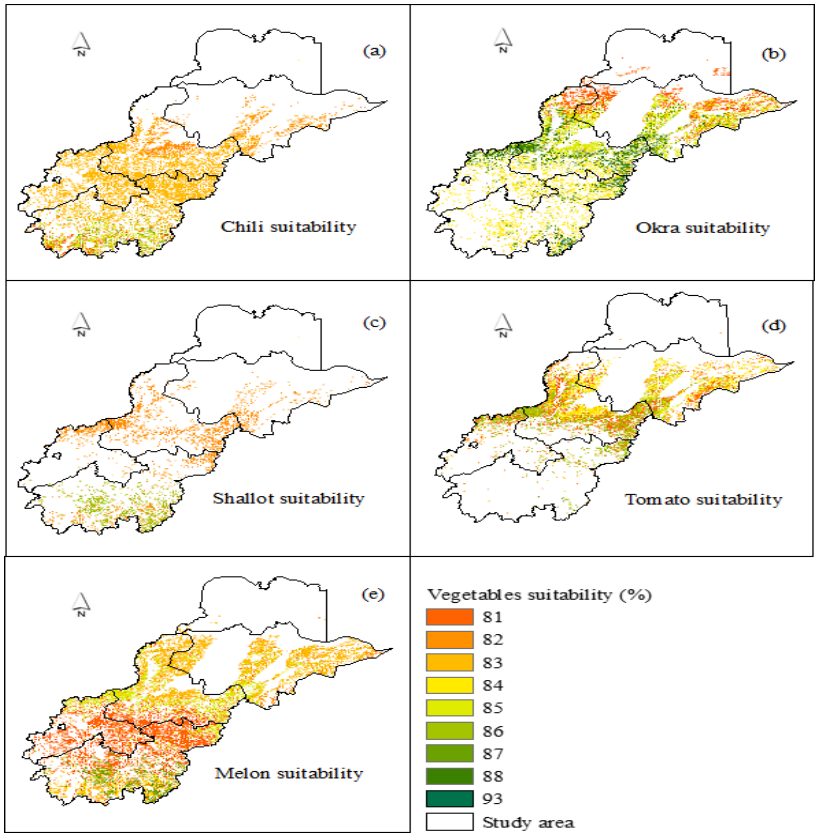
2. Ex-ante impact analysis of conservation practices using Soil and Water Assessment Tool (SWAT)



Study area and topography of the Upper Niger River Basin

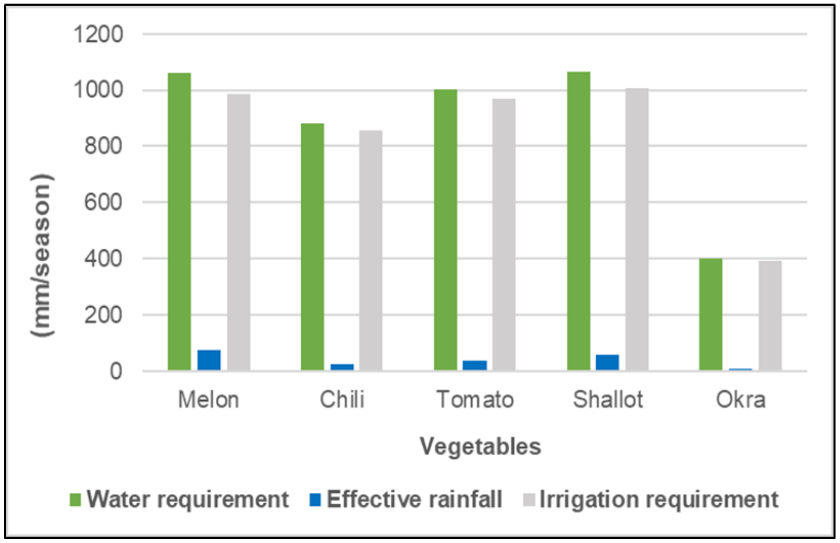
RESULTS: LAND SUITABILITY ASSESSMENT DRY SEASON IRRIGATED VEGETABLES

- Approximately 38 % (9,642,946 ha) of the study area is highly suitable for producing melon
- Okra and chili = 29 % (7,265,377 ha)
- Tomato = 20 % (5,058,642 ha)
- Shallot = 10 % (2,561,537 ha)

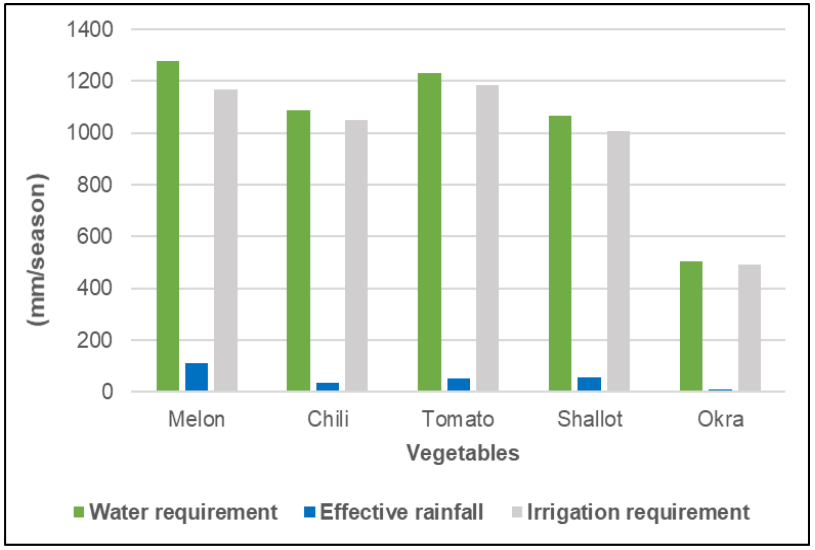


Potential suitability maps for vegetable production

RESULTS: IRRIGATION REQUIREMENT FOR VEGETABLE PRODUCTION IN MALI



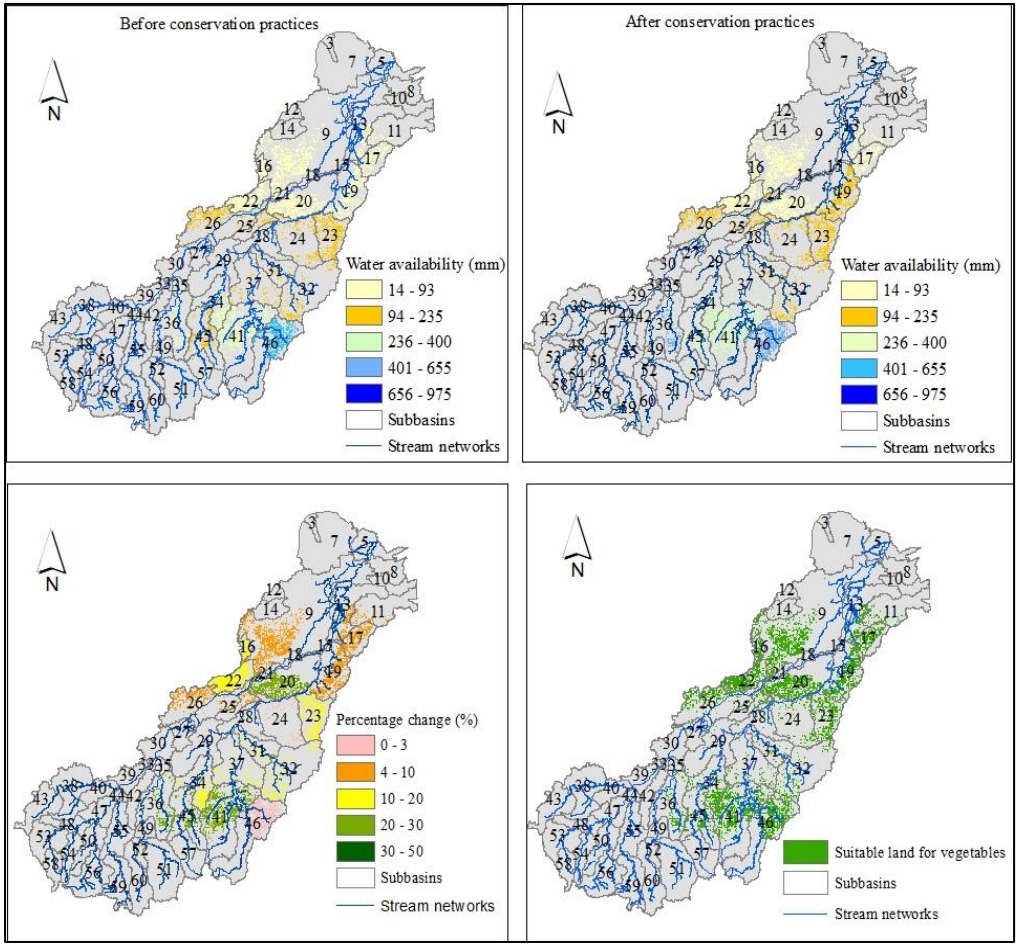
Water requirement, effective rainfall and irrigation requirement of vegetables in Mopti.



Water requirement, effective rainfall and irrigation requirement of vegetables in Sikasso.

RESULTS: IMPACTS OF CONSERVATION AGRICULTURE PRACTICES

- Approximately 9,640,000 ha (37% of the study area in the Malian part) is suitable for vegetable production
- Water use efficiency improved when large water consuming crops were replaced by vegetables
- Conservation practices (mulch, contouring) evaluated with SWAT showed some improvement at subbasin scale, but not in the overall basin water balance



KEY MESSAGE

- Irrigation is necessary to support dry season vegetable/vegetable seed production in Mali
- There is a need to promote sustainable water management practices in Mali, such as improved water harvesting techniques, water-efficient irrigation methods, and better water governance
- Water use efficiency can be enhanced by producing lower water consuming crops

Thank You