HarvestChoice
BETTER CHOICES, BETTER LIVES

SCALING-UP RECOMMENDATIONS*

1. SCALING-UP 101
2. Geospatial Targeting
3. Dynamic Modeling

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* Increasing the reach of Africa RISING…?
e.g., # of farmers, or acres, that use the new, sustainable intensification management practices introduced by AR

SCALING 101

FOUR THINGS TO KEEP IN MIND

1. Not all programs can (or should) be scaled up
2. Multiple pathways for scaling up. The choice depends on the program, target scale, and the environment (spaces)
3. Scaling strategy usually requires tradeoffs between scale, impact, cost and equity
4. Principal challenges are:
   - Aligning incentives: political, economic, social
   - Effective implementation capacity at scale
   - Unit production and delivery costs vs. fiscal constraints
   - Market demand

Source: Scaling-up in Agriculture by Richard Kohl (Center for Large Scale Social Change)

SCALING-UP IS DIFFERENT FROM PROJECT MANAGEMENT

PROJECT

1. Linear
2. Beneficiaries and Non-Beneficiaries
3. Clear ownership and decision rights
4. Dedicated Resources
5. Skills: technical, management & financial

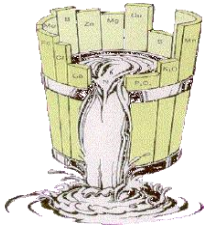
SCALING-UP

1. Non-linear & Iterative
2. Winners and Losers
3. Multi-stakeholder, "Nobody-in-Charge"
4. Usually not resourced
5. Skills: Boundary spanning, system strengthening, advocacy, aligning incentives

Source: Scaling-up in Agriculture by Richard Kohl (Center for Large Scale Social Change)

SCALING 101

CREATING A SCALING UP STRATEGY



1. Assess Scalability
2. Identify the Model: What needs to be scaled up?
3. Identify the Small-Scale Context: Organization, Environment and System
4. Setting Goals for Scaling Up (Where)
5. Analyze Spaces (Large Scale Context & Environment)
6. Choose Roles and Pathways
7. Align the Model, Goals/Vision, Spaces and Pathways
8. Assign Organizational Responsibility, Resources and Skills for Leading Scaling Process
9. Creating Pre-Conditions/Spaces (Financial, Organizational, Political, and Policy)
10. Implementation, Monitor/Adapt, and Sustainability

Source: Scaling-up in Agriculture by Richard Kohl (Center for Large Scale Social Change)

SCALING 101

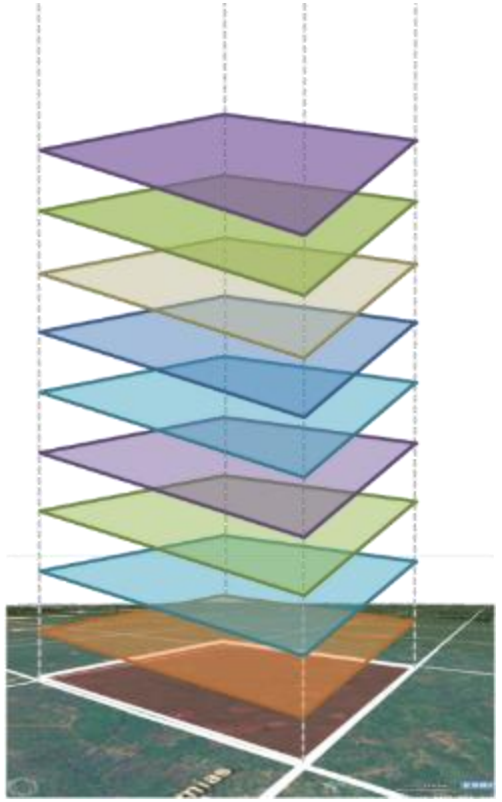
WHAT MAKES A MODEL SCALABLE?

1. Credible: evidence of success, endorsements, causality
2. Observable: you can see and feel the results
3. Relevant: relates to objectively important issues, policy priorities, felt needs of beneficiaries (actual demand vs. objective need)
4. Winners and Losers: who are the stakeholders who will benefit or lose from large scale implementation? Relative power?
5. Clear Advantage: over existing policy, programs, practices or other promising new alternatives i.e. cost effective
6. Easily Implementable (intrinsic): in new contexts, beneficiaries
7. Easy to Adopt and Transfer (extrinsic): compatible with existing organizational capabilities or feasible and affordable capability building (space exists and is easily created)
8. Affordable: Within financial/budgetary constraints at scale (unit cost x desired scale), or price point within means of target users

Align as much as possible with pre-existing spaces!

Source: Scaling-up in Agriculture by Richard Kohl (Center for Large Scale Social Change)

GEOSPATIAL
TARGETING



Where to target technology X?
How much area suitable for this technology?

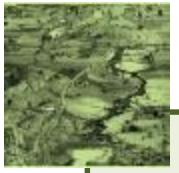
HarvestChoice Data Holdings

Agro-ecology

- Climate
- Soil and water
- Land cover and use
- Agro-ecological domains

Demography

- Population
- Income sources and poverty
- Consumption
- Nutrition



Farming

- Farm practices
- Sub-national production
- Input uses
- Pests and diseases

Productivity

- Yield analysis
- Adoption
- Tech. evaluation
- Spillovers
- Profitability
- Factor productivity

Markets

- Infrastructure and transportation
- Market access
- Value of prod.
- Prices

Investments

- CGIAR CRP activities
- SRO projects
- CAADP CPP activities

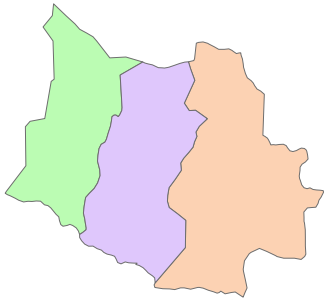
Change
(e.g., policy)

Investment/Policy Analysis

MACRO SCALE

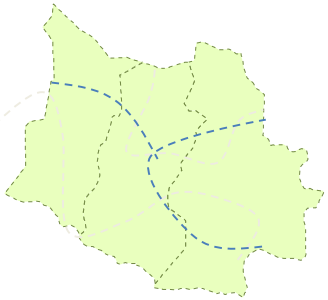
Aggregate, market-scale (geo-political) units

Fixed
Geographies of Analysis



e.g., IMPACT/WATER,
GTAP derivatives

Flexible
Geographies/Units of Analysis



e.g., DREAM,
MM models

Household Characterization

MICRO SCALE

Region	Urban/Rural	Income tercile	Consumption	Production	Inputs

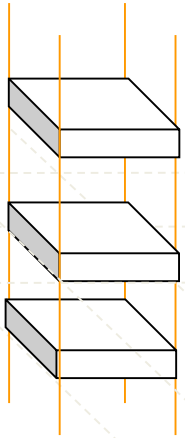
Change
(e.g., climate,
technologies)

Production System & Market Access Analysis

MESO SCALE

Pixels as Units of Analysis

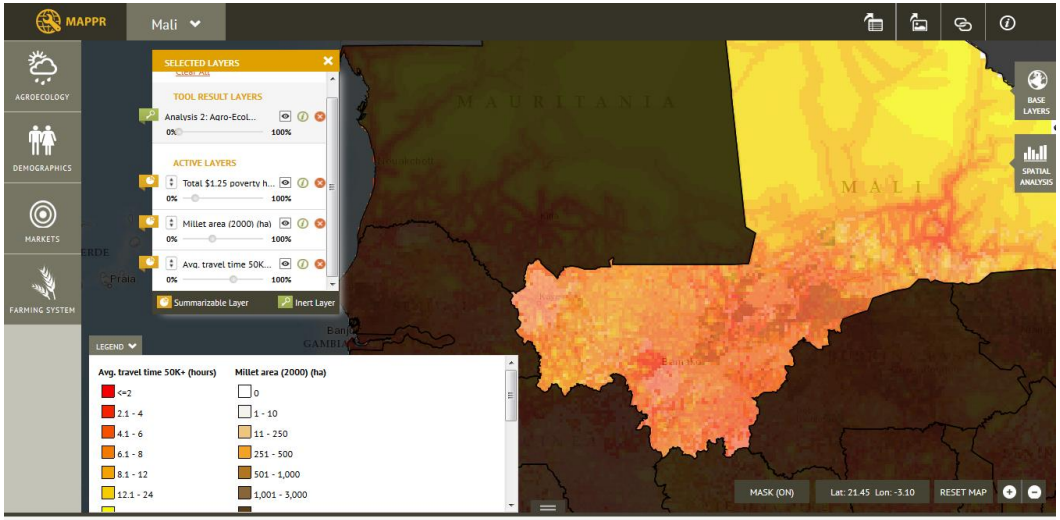
Aggregation
By Commodity



Infrastructure/Market Access

Production System

Ecosystem Services



CHARTS AND TABLES

ANALYSIS 2: AGRO-ECOLOGICAL ZONES (5 CLASS)

MALI, TOTAL $1.25 POVERTY HCR. (2005) (PERCENT), MILLET AREA (2000) (HA), AVG. TRAVEL TIME 50K+ (...

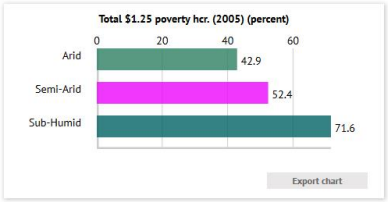
EXPORT RESULTS

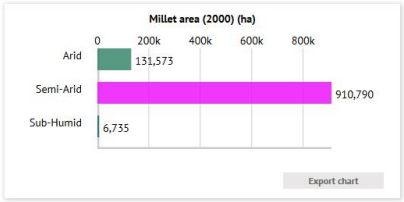
TABLES

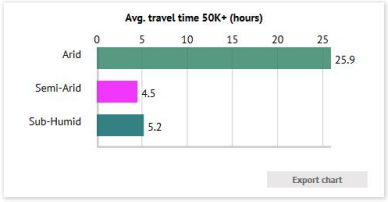
AEZ-5 Warm Tropics	Total $1.25 poverty hcr. (2005) (percent)	Millet area (2000) (ha)	Avg. travel time 50K+ (hours)
Arid	42.9	131,573	25.9
Semi-Arid	52.4	910,790	4.5
Sub-Humid	71.6	6,735	5.2

Export as image | Download CSV

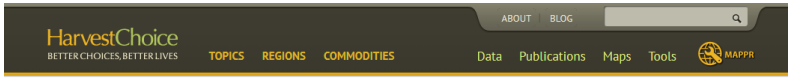
CHARTS







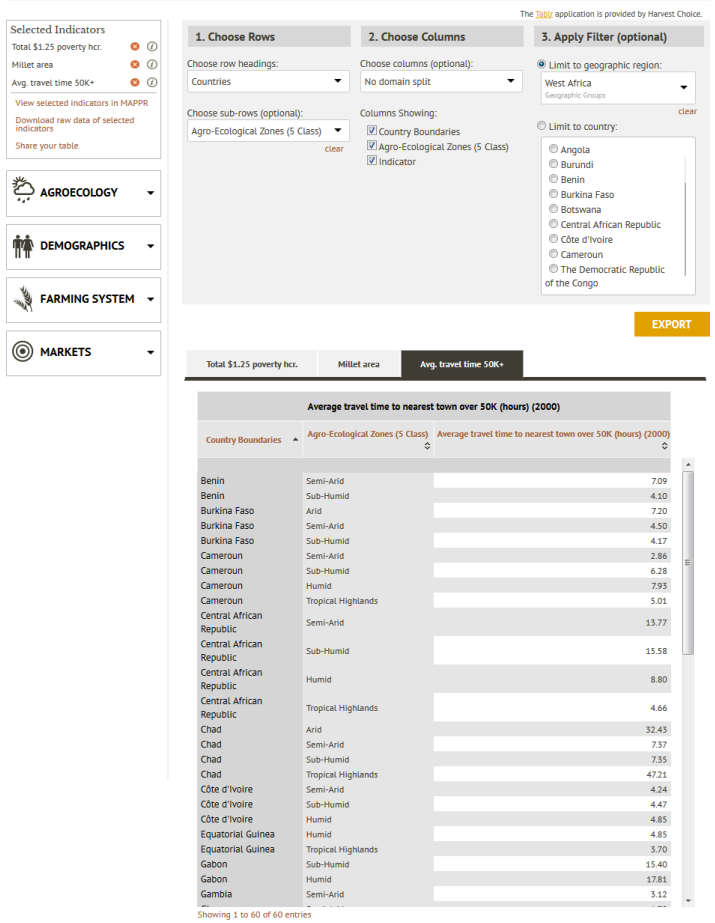
HarvestChoice



Data Catalog | TABLR: Tabulate HarvestChoice Indicators | National Surveys And Agricultural Census | Data API (Beta)

TABLR: Build Your Own Data Tables

This interactive table builder provides access to HarvestChoice sub-national indicators for sub-Saharan Africa. Please choose a custom level of geographic details using the row and column dimension options.



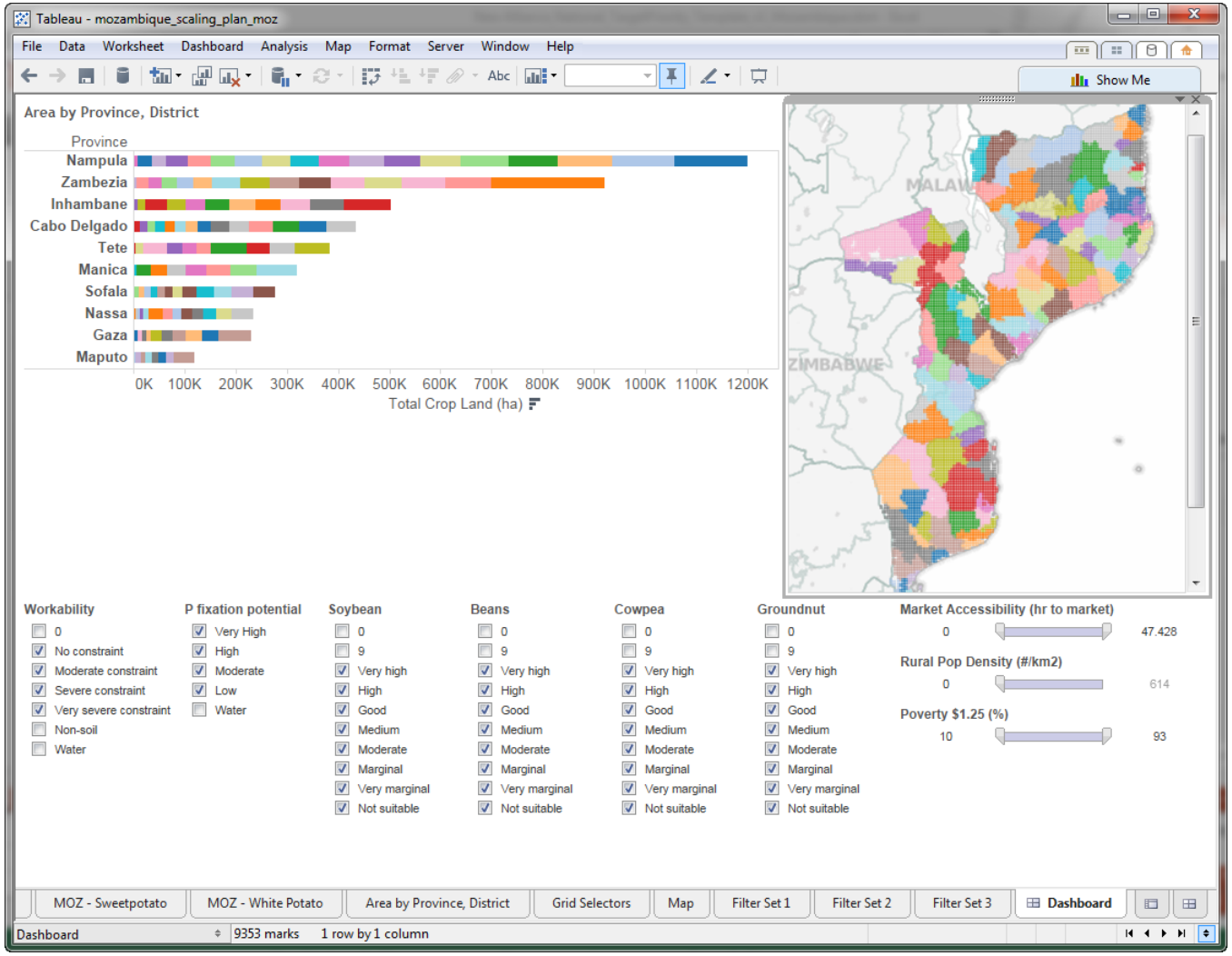
Try:

*harvestchoice.org/**mappr***

*harvestchoice.org/**tablr***

Where in Mozambique meets the selection criteria?

(Or, where do not meet the criteria)



Available online at http://goo.gl/6mE715

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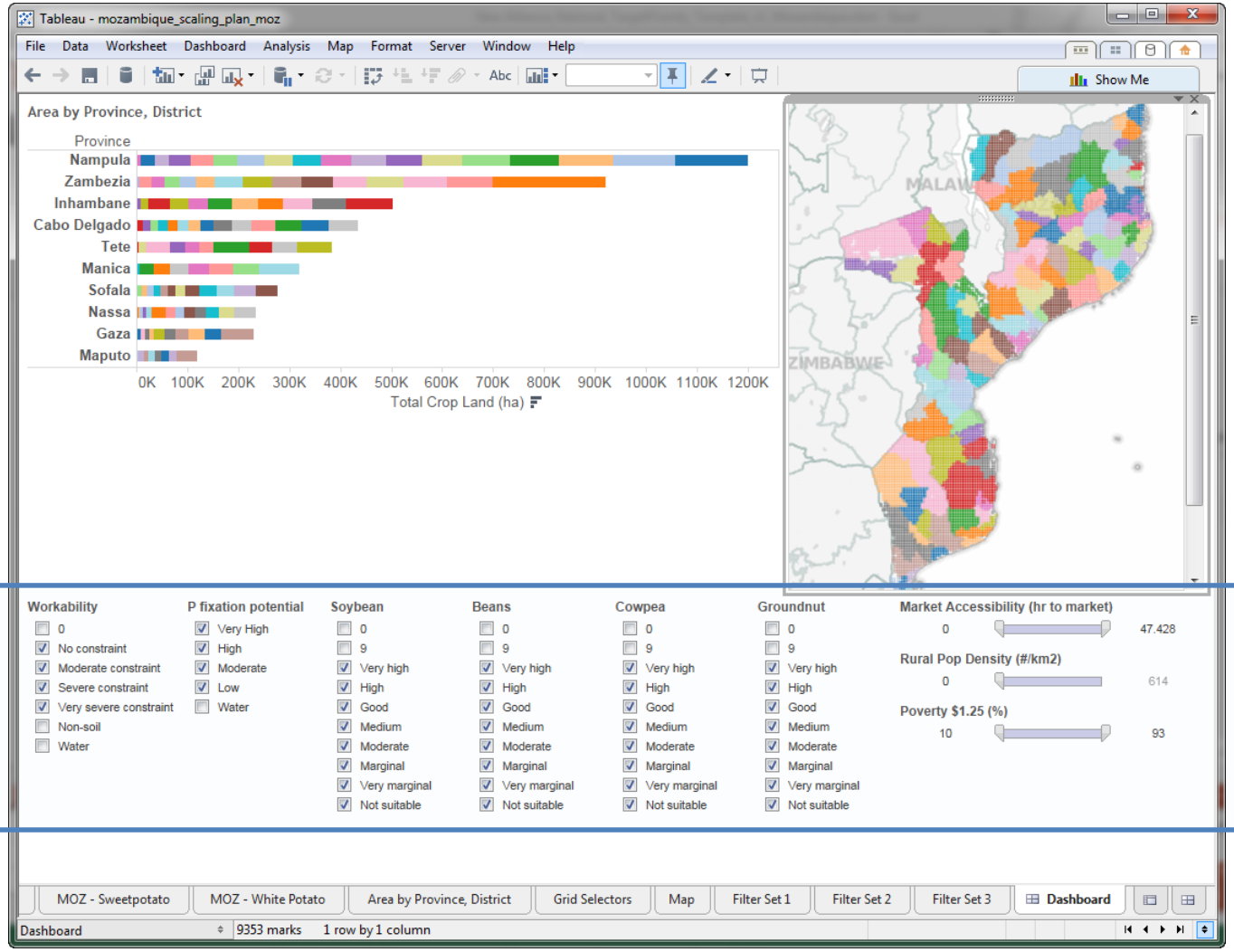


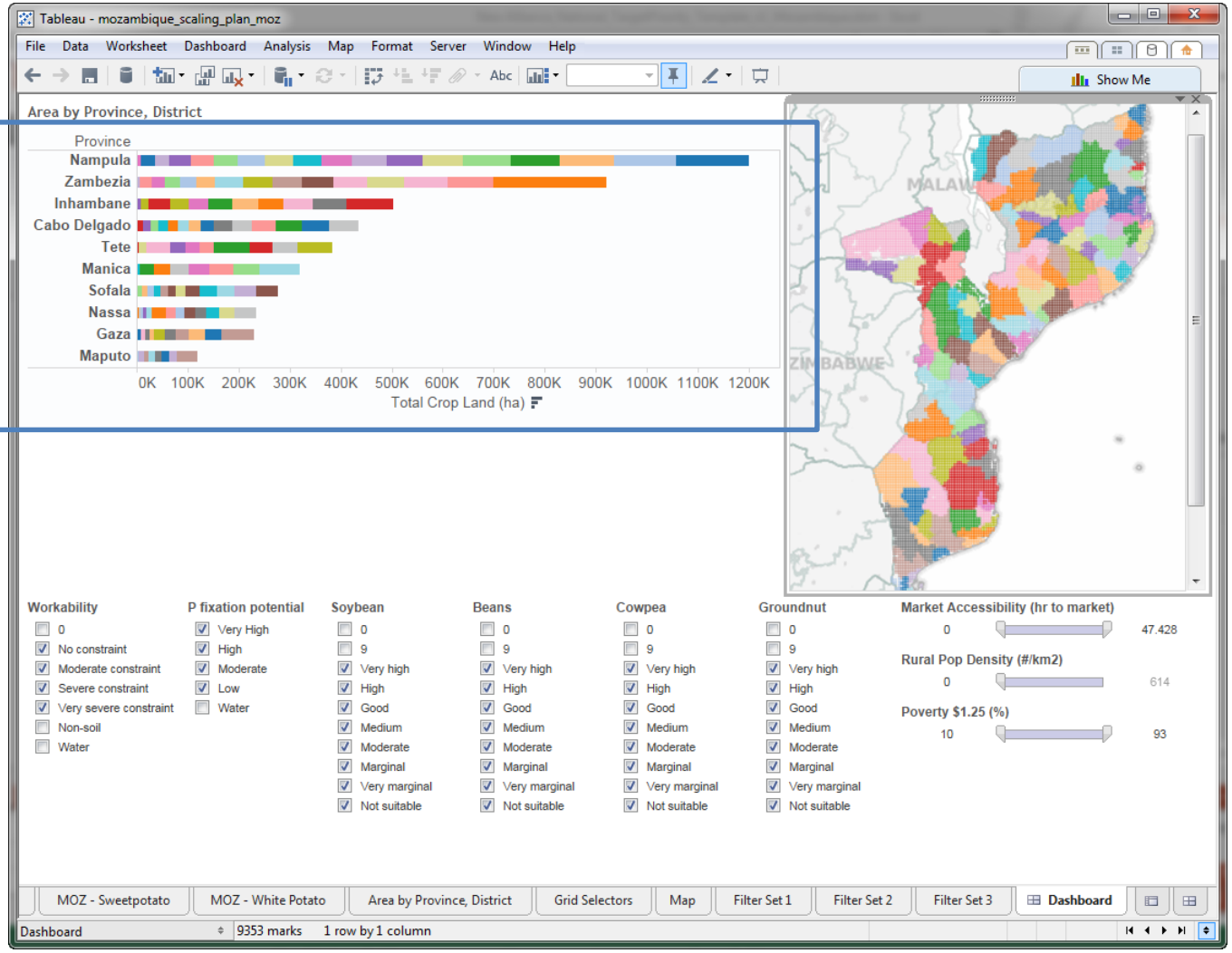
Filtering criteria

Available online at http://goo.gl/6mE715

Where in Mozambique meets the selection criteria?

(Or, where do not meet the criteria)

Cropland area satisfies the criteria (province/ districts)



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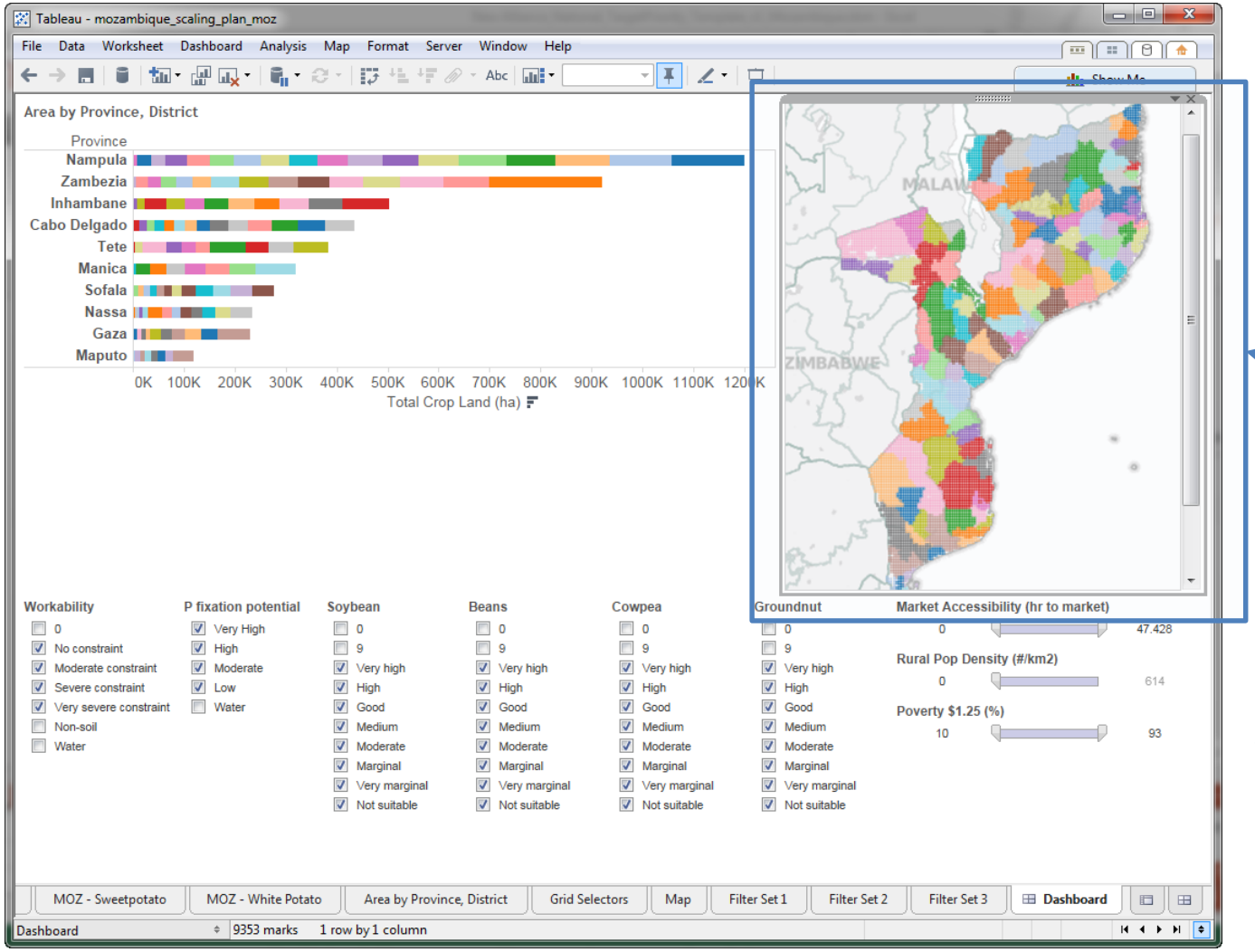


Where the conditions meet (10 km grids)

Available online at http://goo.gl/6mE715

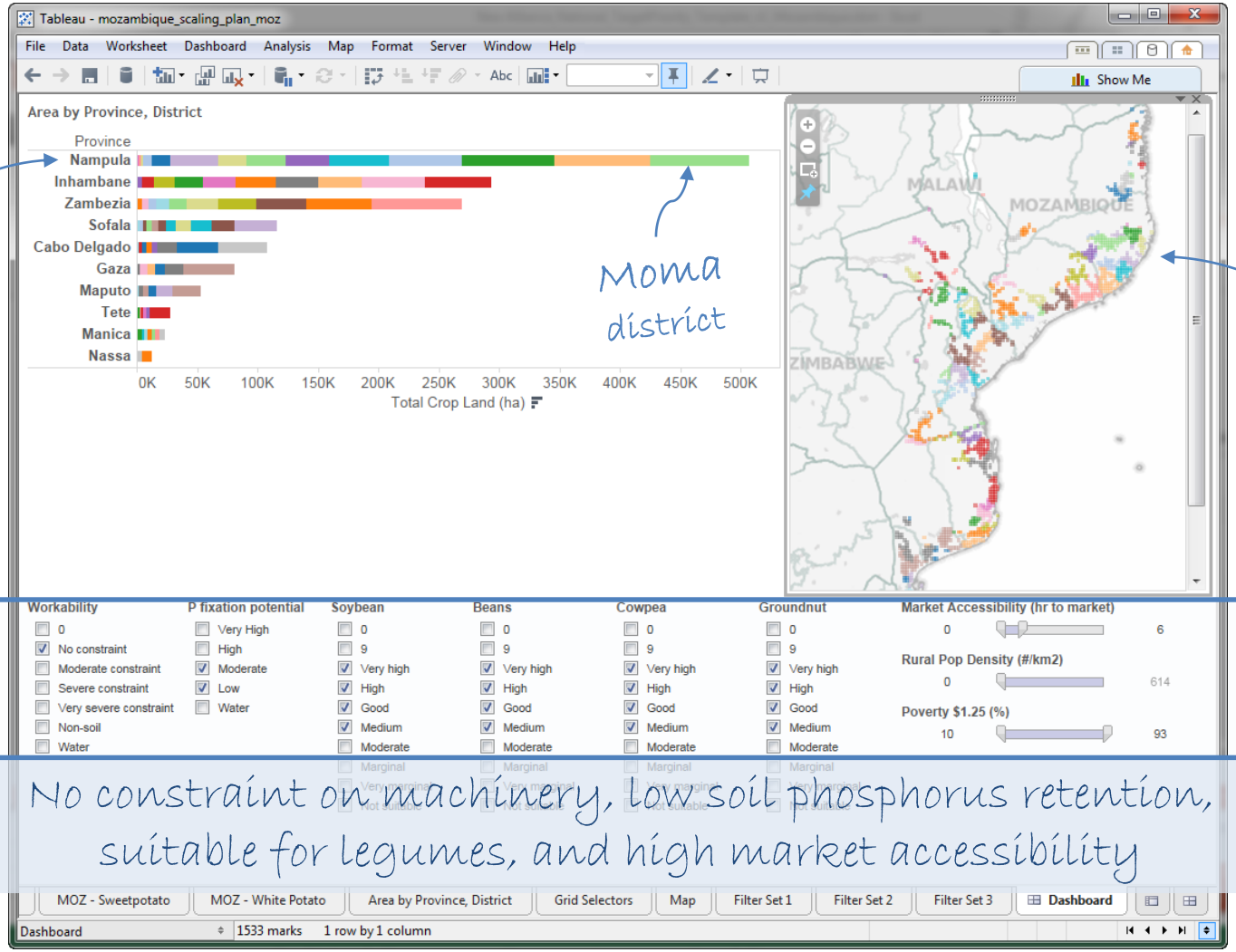
Where in Mozambique meets the selection criteria?

(Or, where do not meet the criteria)

Nampula province ranks highest

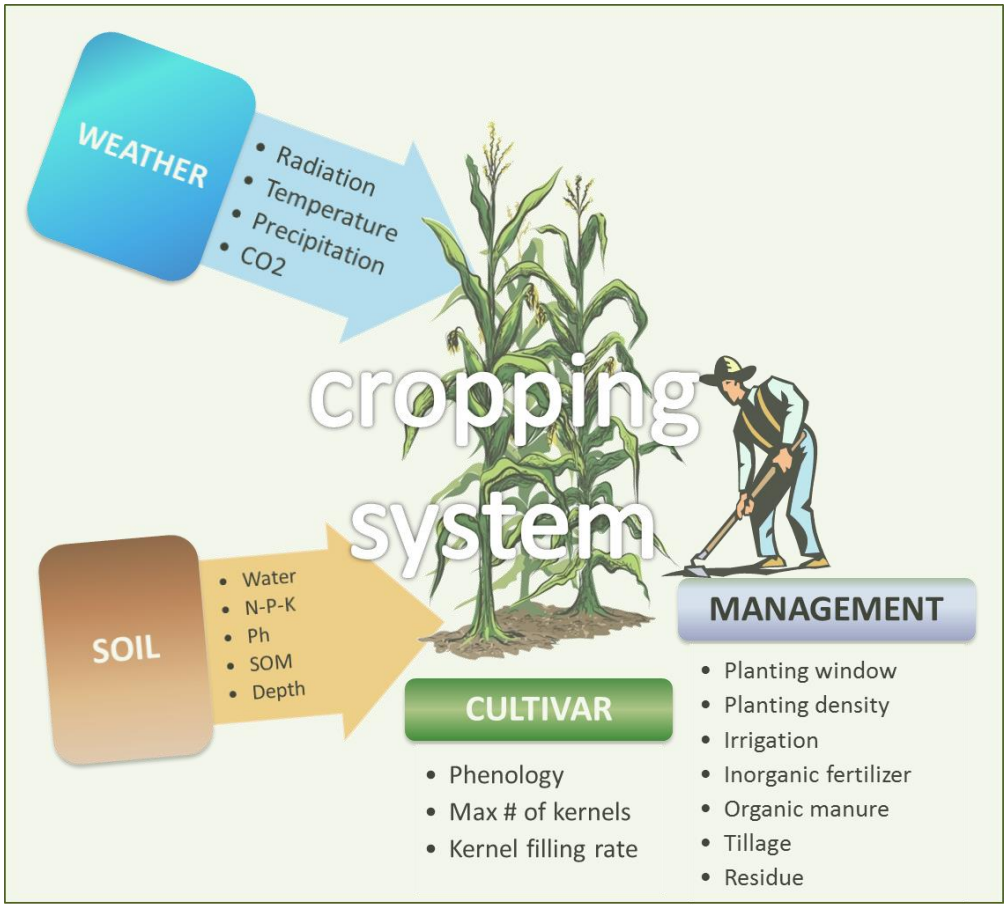
Moma district

Areas that meet the conditions



No constraint on machinery, low soil phosphorus retention, suitable for legumes, and high market accessibility

DYNAMIC CROPPING SYSTEMS MODELING



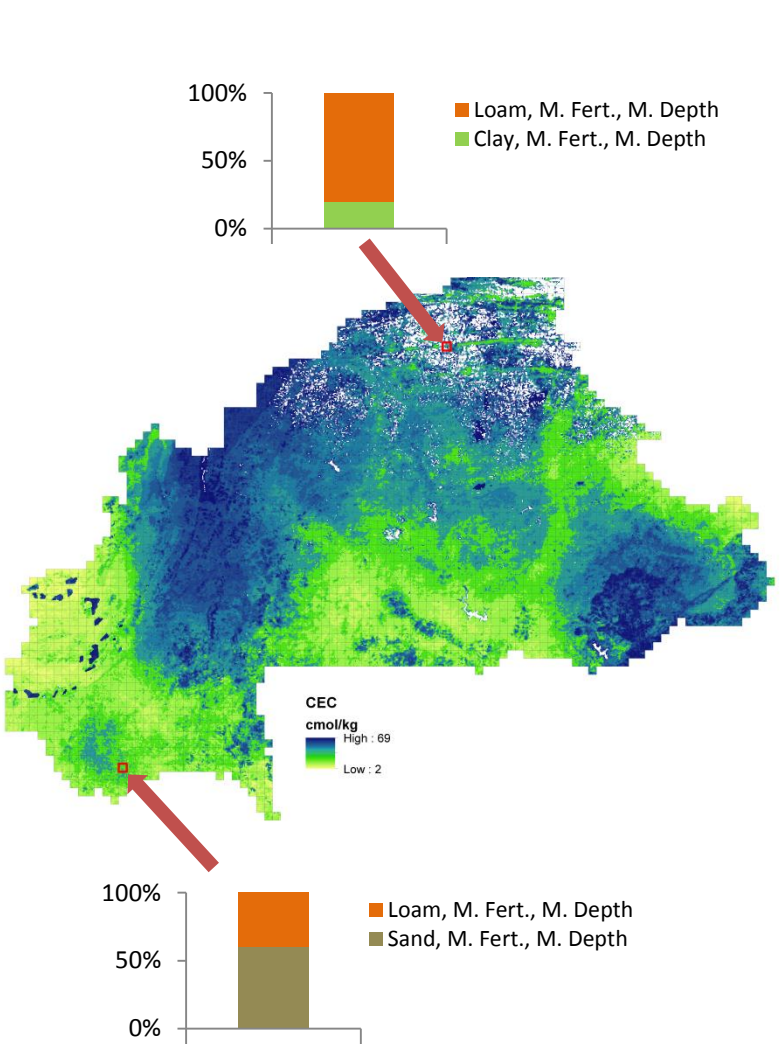
What'd be the potential impact of technology X?

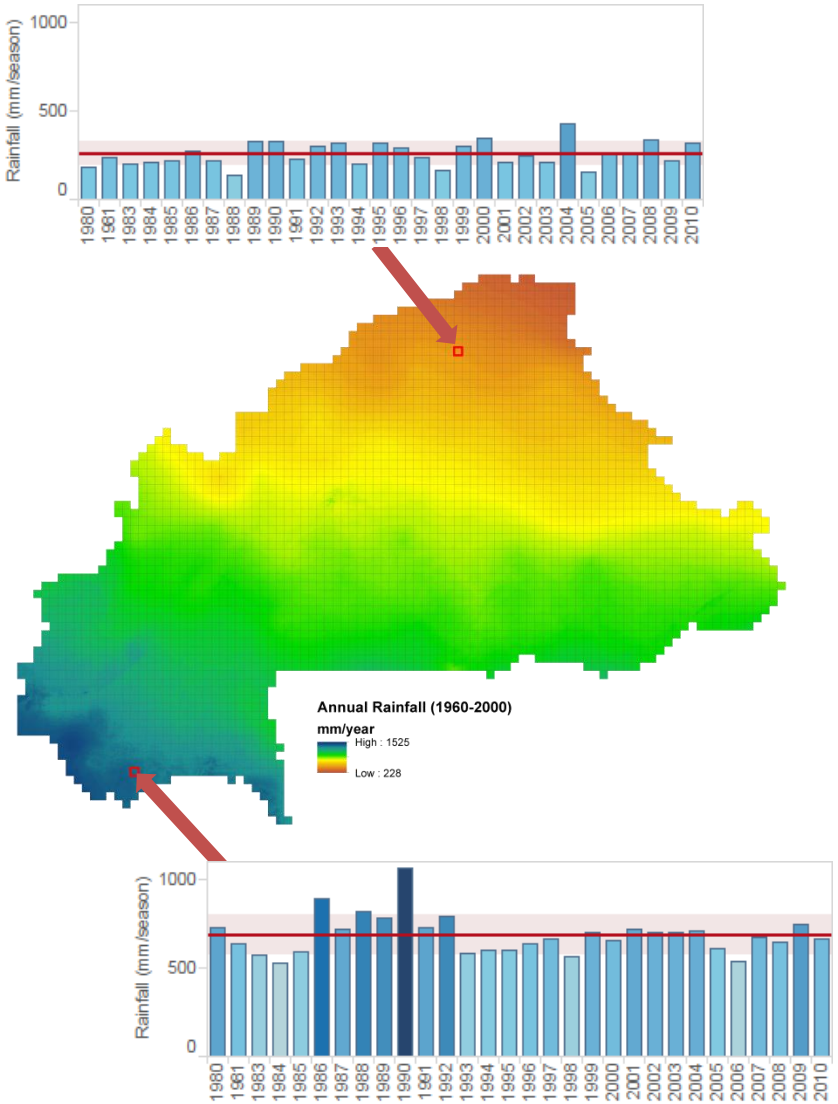
Estimating Potential Productivity Gains

	Millet	Sorghum	Maize
Crop Model	CERES-Millet in DSSAT v4.5	CERES-Sorghum in DSSAT v4.5	CERES-Maize in DSSAT v4.5
Local/Traditional Variety	Sadore	CSM63 Baseline	Generic, long maturity
Improved Hybrid Variety	Sanioba B	CSV15 High Yielding	FM 6 Hybrid
Manure	0, 1 ton/ha		
Inorganic Fertilizer	0, 40[N]kg/ha		

- Simulation period: 1982-2009
- Weather data: AgMERRA Gridded Daily Weather Database by AgMIP and U. Chicago
- Soil data assumptions: HC27 Generic Soil Profiles, spatially distributed based on the soil texture maps from the Soil Functional Capacity Classification System by CIESIN
- Crop geography: SPAM 2005 by HarvestChoice

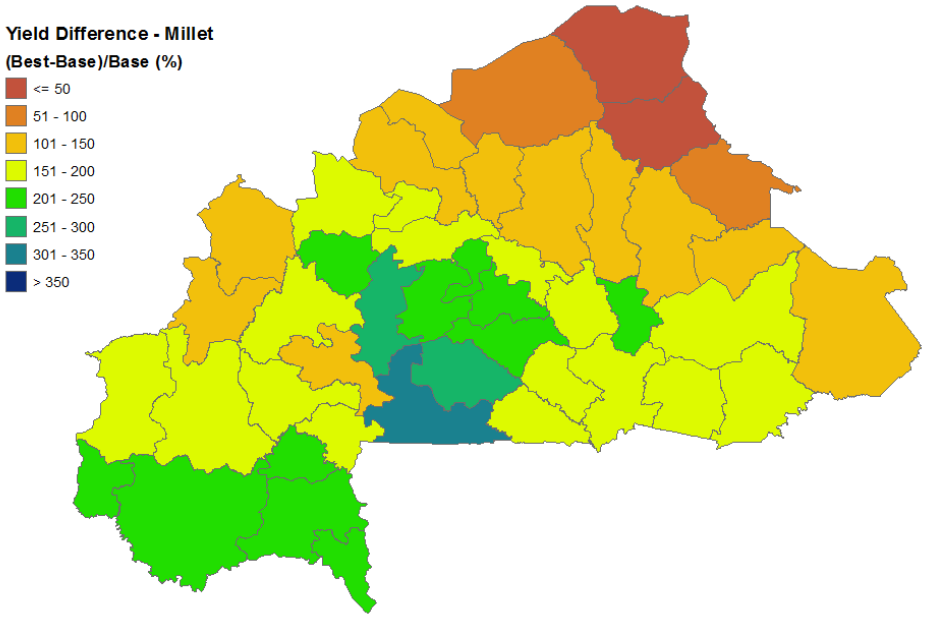
Accounting for Local Soil & Climate Variability

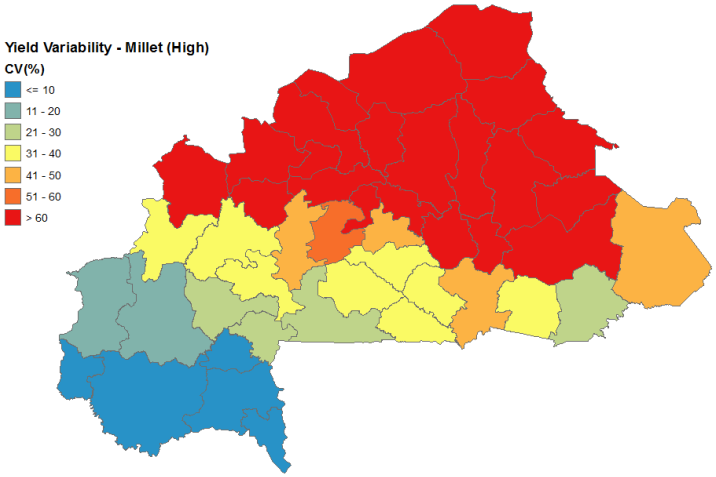


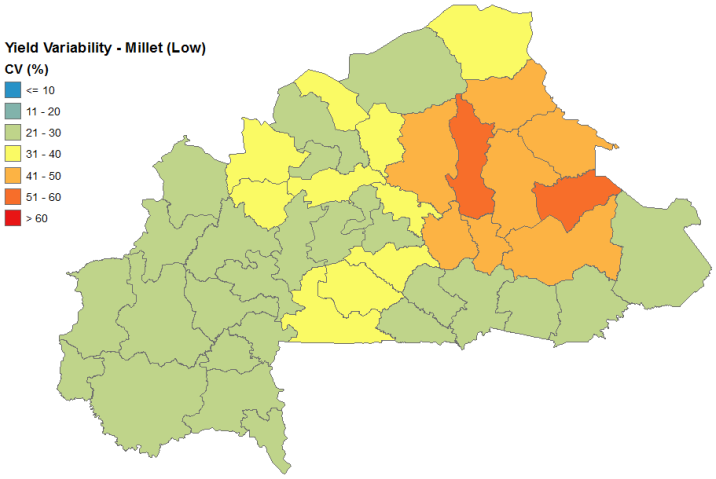


Source: HarvestChoice (2013)

Millet Productivity Interventions: Potential ΔYields & Yield Variability

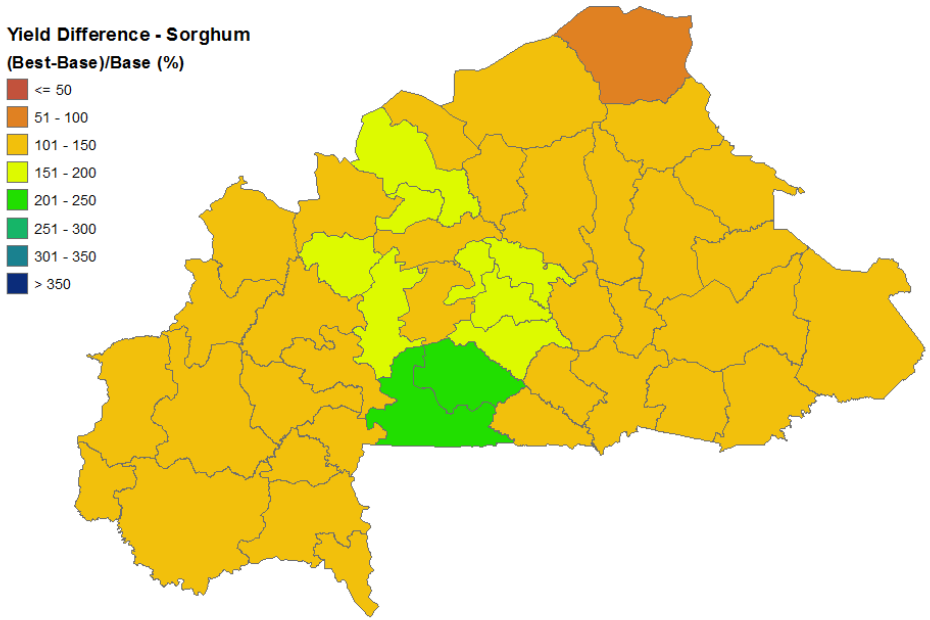


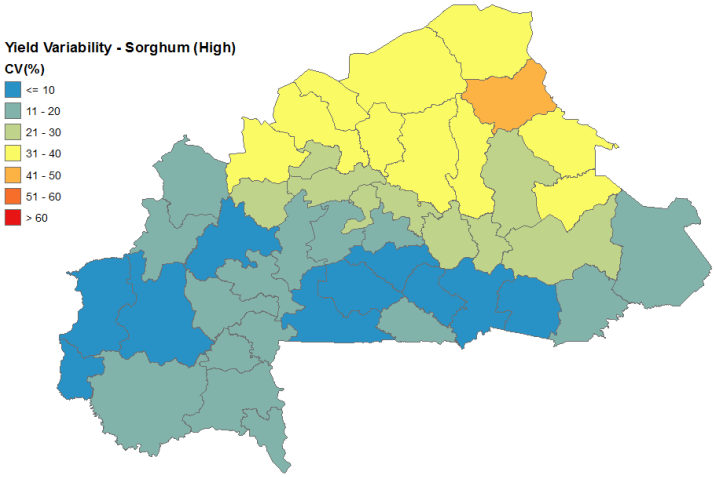


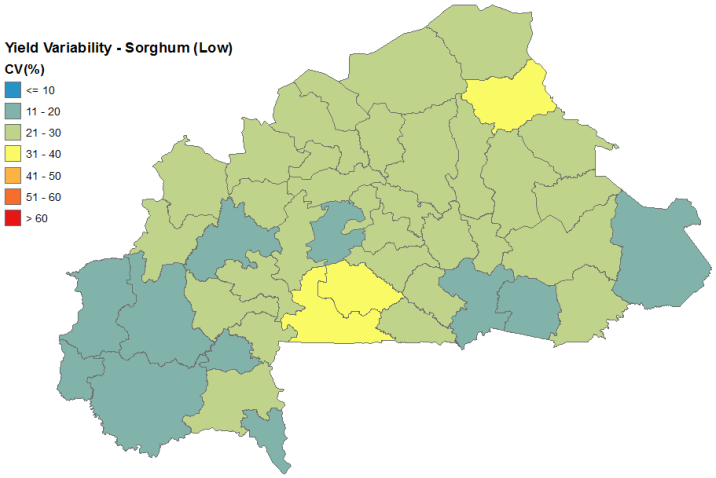


Source: HarvestChoice (2013)

Sorghum Productivity Interventions: Potential ΔYields & Yield Variability

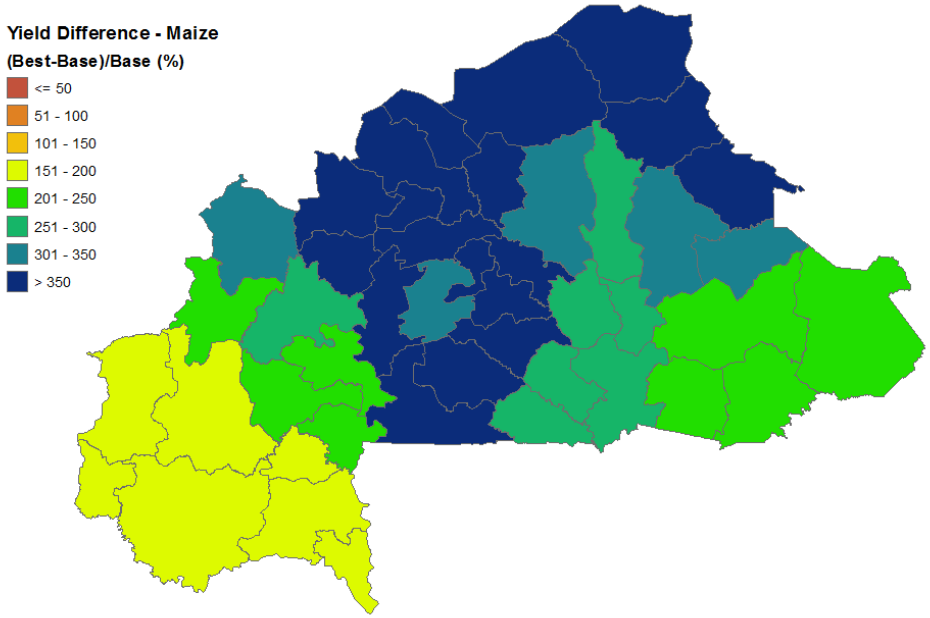


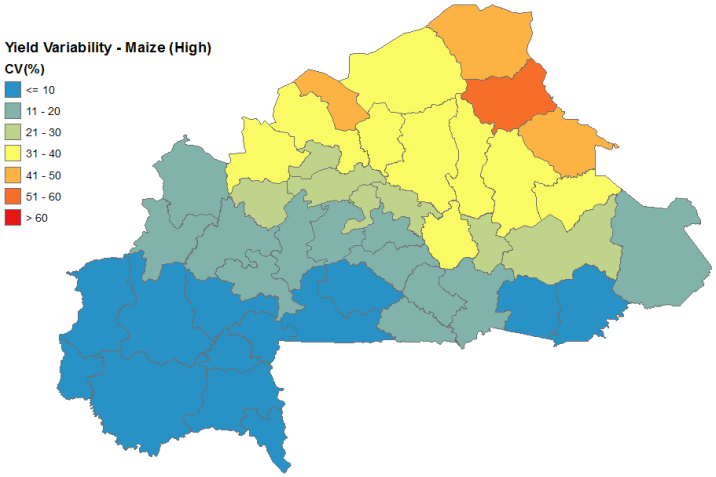


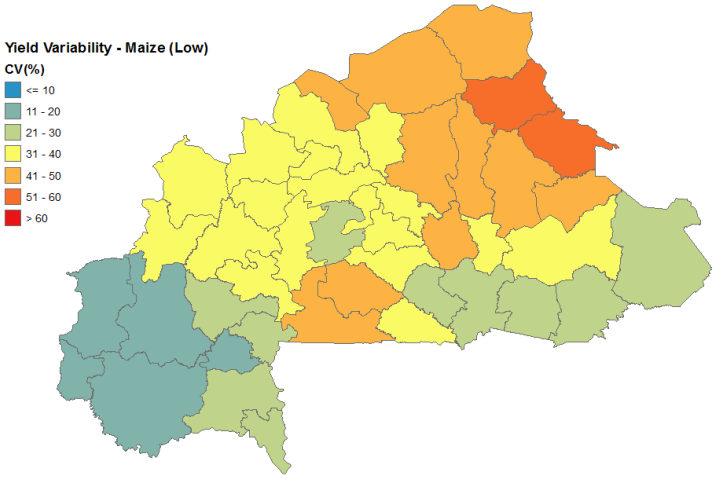


Source: HarvestChoice (2013)

Maize Productivity Interventions: Potential ΔYields & Yield Variability





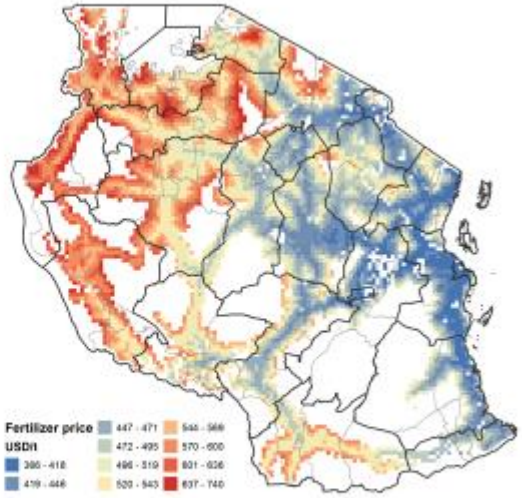


Source: HarvestChoice (2013)

1

UREA PRICE

Farmgate price of urea fertilizer modeled from the prices at major markets. Transportation cost taken into account from the Dar es Salaam port.

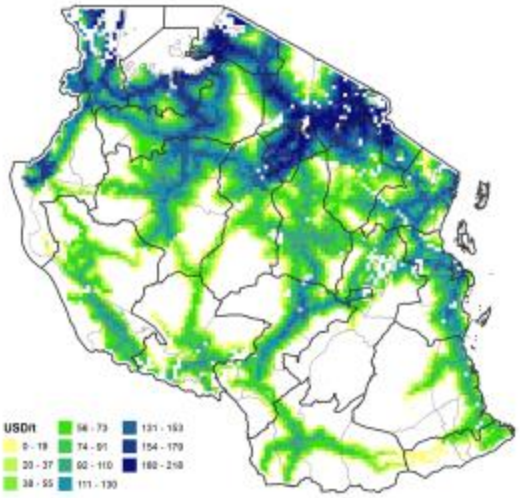


Source: HarvestChoice 2011

2

MAIZE PRICE

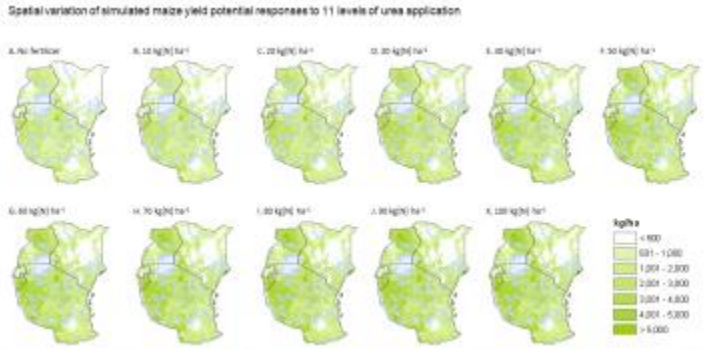
Farmgate maize price modeled from the main markets.

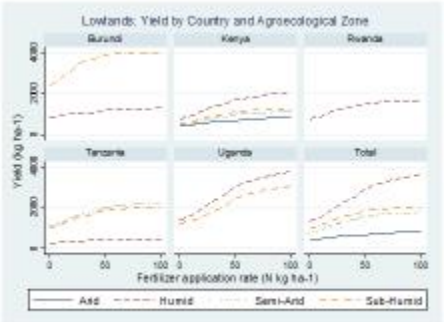


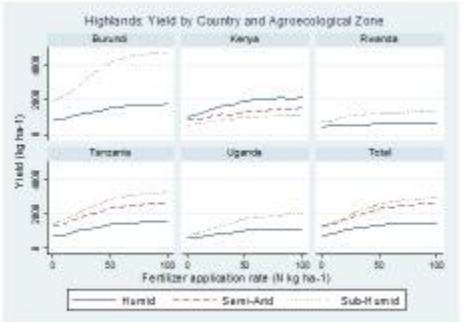
Source: HarvestChoice 2011

3

SIMULATED
MAIZE YIELD RESPONSES
TO UREA FERTILIZATION





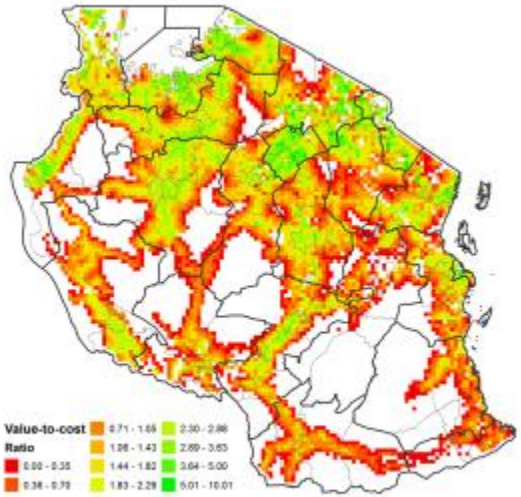


4

PROFITABILITY

Site-specifically modeled profitability of urea fertilizer application on maize.

Red: not profitable
Orange: less profitable
Green: profitable



Source: HarvestChoice 2011

COST-BENEFIT ANALYSIS

TABLE OF PARAMETERS

TABLE OF PARAMETERS

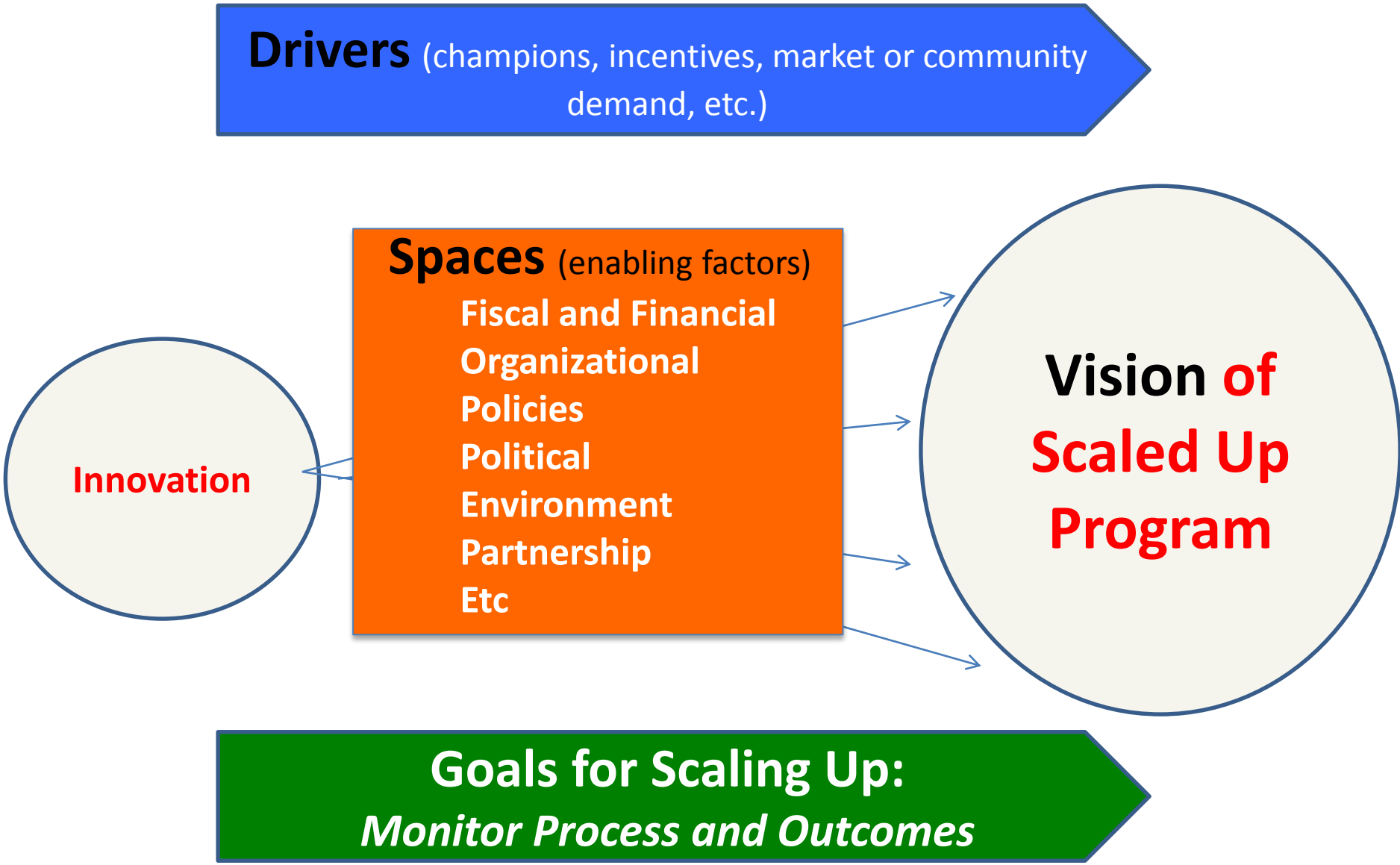
WITHOUT PROJECT - YAMS			WITH PROJECT - YAMS		
Discount Rate	0.12	%			
Production Information	**Quantity**	**Units**	**Production Information**	**Quantity**	**Units**
Price (Year 0)	3.75	$/kg	Price	3.75	$/kg
Price (Years 1 - 9)	0%	annual % change	Price (Years 1 - 9)	0%	annual % change
Yield	475	kg/ha	Yield	500	kg/ha
Additional Yield Year 1 - 9	0	kg/ha	Additional Yield Year 1 - 9	75	kg/ha
Household Consumption	75	per HH	Household Consumption	75	per HH
Costs			**Costs**		
Seeds	25	$/ha	Seeds	50	$/ha
Fertilizer	35	$/ha	Fertilizer	60	$/ha
Land Rent (opportunity cost)	500	$/ha	Land Rent (opportunity cost)	500	$/ha
Irrigation	20	$/ha	Irrigation	40	$/ha
New Investment (Year 0 only)	0	$/ha	New Investment (Year 0 only)	200	$/ha
Depreciation (Y1+)	0	$/ha	Depreciation (Y1+)	50	$/ha
Family Labor (opportunity cost)	150	days per ha	Family Labor (opportunity cost)	200	days per ha
Hired Labor	5	days per ha	Hired Labor	40	days per ha
Wage Rate	1.25	$ per day	Wage Rate	1.25	$ per day
Farm Characteristics			**Farm Characteristics**		
Farm Size	1.5	ha	Farm Size	1.5	ha
Average HH Size	4.5	persons	Average HH Size	4.5	persons

Model

FARM BUDGET

WITHOUT PROJECT - YAMS (all units in US$)				WITH PROJECT - YAMS (all units in US$)			
Year<<<<	0	1	2	Year<<<<	0	1	2
Gross Revenue	2,672	2,672	2,672	Gross Revenue	2,813	3,234	3,234
Sales	2,391	2,391	2,391	Sales	2,532	2,953	2,953
On-farm Consumption	281	281	281	On-farm Consumption	281	281	281
Operatings Costs	129	129	129	Operatings Costs	300	300	300
Seeds	38	38	38	Seeds	75	75	75
Fertilizer	53	53	53	Fertilizer	90	90	90
Irrigation	30	30	30	Irrigation	60	60	60
Hired labor	9	9	9	Hired labor	75	75	75
Gross Margin	2,543	2,543	2,543	Gross Margin	2,513	2,934	2,934
Fixed Costs	750	750	750	Fixed Costs	750	800	800
Annual Depreciation	-	-	-	Annual Depreciation	-	50	50
Land (opportunity cost)	750	750	750	Land (opportunity cost)	750	750	750
Family Labor (op. cost)	225	225	225	Family Labor (op. cost)	300	300	300
Net Farm Profit	1,793	1,793	1,793	Net Farm Profit	1,763	2,134	2,134
Net Farm Income	**2,018**	**2,018**	**2,018**	**Net Farm Income**	**2,063**	**2,434**	**2,434**

Model



Source: Scaling-up in Agriculture by Richard Kohl (Center for Large Scale Social Change)