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Returns to Land Management Practices in Nigeria

- Impact of Fadama II on crop production
- Income
- Fertilizer
- Manure
- Cover crops
- Irrigation

Impact of Fadama II on Crop, Livestock & Non-Farm Income – Matched Sample

Crop	Fadama II beneficiaries	Non-Fadama II households	Pairwise comparison (p-value)
	Value in 2006 (000' Naira/household)		
Crops	517	315	0.008***
	Change of value income (2005 – 2006)		
Crops	68	-17	0.000***
Livestock	-32	-2	0.143
Non-farm	11	21	0.097

Impact of Fadama II on Irrigation – Matched Sample

Crop	Fadama II beneficiaries	Non-Fadama II households	Pairwise comparison (p-value)
	% using irrigation		
Maize	26.3	13.0	0.000**
Rice	28.3	20.6	0.042**
Cowpea	1.27	8.6	0.409
Tomatoes	85.5	70.9	0.040**
Cassava	6.9	4.8	0.537
Pepper	82.0	77.0	0.480
Yams	5.9	4.3	0.665
Leafy vegetables	64.2	44.1	0.010***
Onions	93.5	90.4	0.583



Impact of Fadama II on Household income

- Income of Fadama II beneficiaries ↑ by about 60%, mainly through crop production
- Results confirm Fadama II focus on the poor, who depend on crops rather than non-farm activities
- Fadama II played a major role in increasing rate of irrigation, which is a significant determinant of crop yield

Irrigation across Agroecological Zones

Crop	Humid forest	Moist Savannah	Dry Savannah	Pairwise comparison (p-value)
	% Irrigating			
Irrigation (any crop)	10.0	9.6	25.9	b, c
Maize	12.3	12.9	18.6	
Tomato	-	-	86.1	
Pepper	-	-	82.5	
Yam	-	12.0	-	
Cassava	5.8	-	25.9	
Rice	-	26.7	21.8	
Leafy vegetables	50.6	-	-	

Returns to Fertilizer Use

Crop	Sample	Base fertilizer price			50% fertilizer price ↑
		Elasticity	VCR (mean)	VCR (median)	VCR (mean)
Maize	511	0.04	0.4	0.6	0.17
Rice	307	0.36***	3.0	5.6	1.51
Cassava	72	0.26**	5.4	10.2	2.70
Yam	82	0.22	16.4	15.0	8.22
Cowpea	2	2.20***	-	-	
Leafy vegetables	76	0.13	2.0	2.5	1.00
Pepper	96	0.51*	577.2	256.4	288.58
Tomato	87	0.60***	541.5	267.9	270.75
Onions	98	0.12	27.0	0.8	0.32



Fertilizer Use

- Fertilizer use is most profitable for horticultural crops (pepper, tomato & leafy vegetables), even when price of fertilizer increases by 50%.
- Fertilizer is profitable for the presidential initiative crops analyzed (cassava & rice), even when fertilizer price increases by 50%



Fertilizer Use

- Use of fertilizer on horticultural crops, cassava and rice is limited – Why?
 - Is access to fertilizer a problem?
 - Is packaging, type of fertilizer a problem?
 - Is marketing of agricultural output a problem – especially the perishable horticultural crops?



Fertilizer Use

- Fertilizer use is not profitable for maize production
 - With increasing demand for maize – replacing the traditional staple foods such as sorghum & millet, maize deserves a closer look to explore how it can be developed to meet the growing demand
 - Irrigation: a potential strategy as the crop is grown mainly in the dry & moist savannah

Use of Cover Crops and Manure across Agroecological Zones

Land management practice	Humid forest	Moist Savannah	Dry Savannah	Pairwise comparison (p-value)
	% using			
Manure	19	15	40	b, c
Cover crop	3	2	11	b, c

• Dry Savannah Zone

- using better management practices & irrigation than all other zones.
- Produces a large share of maize (60%) & rice (60%)
- Is this the breadbasket of the growing Nigerian population? If not, it shows the potential

Impact of Land management Practices & Irrigation on Value of Crop/Ha

Crop	Manure	Cover crops	Irrigation
	Elasticity		
Maize	0.20	-1.87***	1.45***
Rice	0.27	-1.70***	1.18***
Cassava	-0.42	1.01*	-0.95
Yam	0.71**	0.32	-0.43
Cowpea	-0.23	0.00	1.53**
Leafy vegetables	0.40	-1.13	-0.26
Pepper	0.56*	0.34	0.61*
Tomato	1.01***	-0.72	1.77***
Onions	0.98***	-1.41***	2.05***



Cover crops (Agroforestry)

- Generally, cover crops have negative impact on crop productivity
 - Could be due to the crop/agroforestry tree/cover crop competition
 - Need to promote agroforestry trees with multipurpose to compensate the nutrient, light and space competition
 - Long & short-term benefits of cover crops not included in this analysis
 - For example cover crop improve soil fertility, can be used to feed livestock, etc

**We acknowledge the financial
support of the**

Canada

Canadian International Development Agency