Sweetpotato Value Chain Assessment Nigeria

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Sweetpotato production statistics

State	SP production (Million tones)
Cross River	2.73
Taraba	2.46
Plateau	2.46
Benue	2.27
Niger	2.09
Nassarawa	1.33

*National statistics

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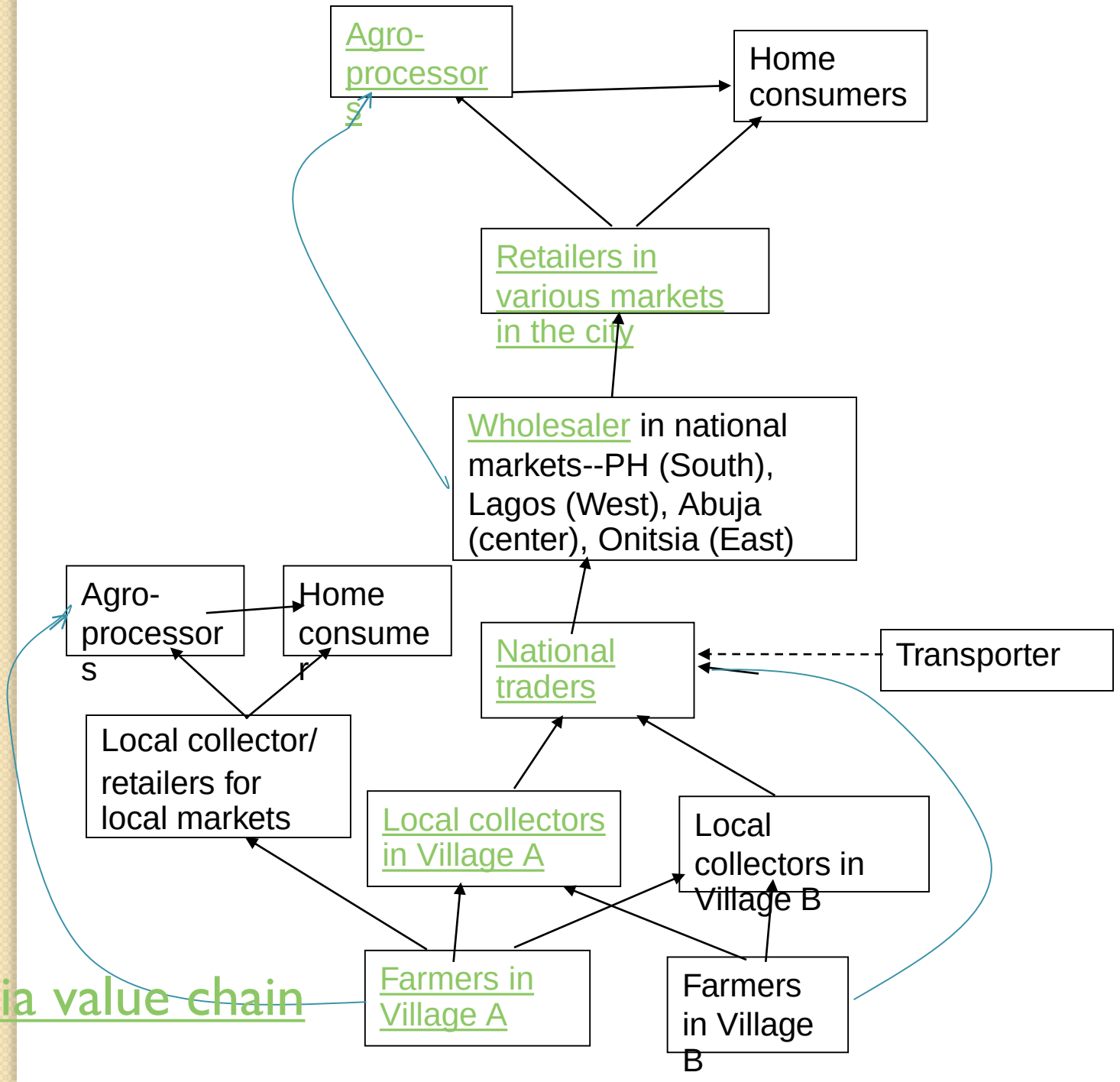
	Lagos	Pt. Harcourt		Abuja
		Trailer park	Borokiri	
Aug-Dec	Bauchi, Gombe, Kano, Zaria, Kwara	Kano, Zaria, Maidugari, Ebonyi	Cross River Jos, Bauchi, Kano	Bauchi, Keffi, Kano, Zaria, Plateau
Jan-Aug	Maidugari	Kano, Gombe, Zaria,	Adamawa Gombe Cross River	Zaria

Estimated volume distributed in the major markets

	Abuja	Pt. Harcourt	Lagos	
			Current	Market capacity
Ton/yr.	26,000	17,300	177,200	750,000

Lagos markets can absorb 20-50 trailers each day, but do not always get that much supply, particularly during Jan-Jul when supply becomes scarce.

Nigeria value chain



General characteristics

- Producers specializing in SP as a cash crop only 4-5 years ago
- Some caught on rapidly, others in transition, and while many still grow for home consumption mainly
- Resulting in differentiated sweetpotato producers
- Whether growing specific for cash, in transition, or food, all sell various portions of production due to perishability

Characteristics of 3 types of producers

	Land area (ha/P)	SP land area		% SP sold	Var
		Ha/hh	% total land		
I. Specialize in SP, large areas of land allocated to SP, plant commercial variety, targeting national markets					
Zaria, Kaduna	1.7	7.9	66	99	Bota
Abuja	1.1	5.3	70	80*	Bota*
Asa, Kwara	0.4	2.2	35	90	Apu
II. SP as one of the important cash crops, smaller areas of land allocated to SP, various varieties, mainly local market					
Effium, Ebonyi	0.7	5.1	37	75	3 var
Makurdi, Benue	0.7	2.6	47	70	3 var
Jalingo, Taraba	0.4	1.9	42	92	5 var
Offa, Kwara	0.3	0.5	27	67	3 var
Obi, Nassrawa	0.7	1.6	20	80	3 var
III. SP not considered a cash crop, small areas of land growing SP, various varieties, local markets					
Burukuru, Benue	0.2	0.5	12	50	4 var

Profits and income

	% Buy seed	Yield (t/ha)	Price^ (n/kg)	Inter-crop	Profit (n/ha)	Cash crops
I. Need to buy seed, high yields, uniformed prices, SP is #1 crop, but still intercrop						
Zaria, Kaduna	85	10.5	15 -18.9	Rice	59,500	SP
Abuja	100	3.6	15.6-17.5	Maize	5,000	SP
Asa, Kwara	100	6.2	20-25	Cassava	122,000	SP, yam, cassava
II. Buy less seed as needs are lower, lower yields, prices vary, SP one of cash crops						
Effium, Ebonyi	0	6.2	25-28	Tomato	57,000	Tomato, cassava, yam, SP
Makurdi, Benue	55	2.8	9.5	Cassava	36,281	Yam, cassava, rice, soy, peanut, SP
Jalingo, Taraba	30	3.7	15.6	Maize	29,565	Cane, maize, rice, cassava, SP
Offa, Kwara	90	3.5	16-19	Cassava	22,000	Cassava, maize, tomato, yam, SP
Obi, Nassrawa	0	3.1	9.5	Maize	38,825	Rice, yam, sorghum, maize
III. Low need to buy seed, low yielding, price vary greatly with local SP demand but market size small, not considered a cash crop						

Production costs (n/ha)

	Fertilizer		Costs (naira/ha)						
	bag/ ha	Cost/ ha	*Ridging*	Plant	weed	harvest	Seed	Transpt	Total costs
I. Do not necessarily use more fertilizer, collected directly w/o transport cost, high seed cost									
Zaria	4	25,944	28,000	0	26,000	6,750	7,000	0	93,194
Abuja	2	13,155	28,286	6,500	25,685	4,400	5,000	0	76,525
Asa	0	0	27,940	11,430	5,000	7,620	10,160	6,773	68,923
		16.4	**35.5**	7.3	**23.8**	7.9	9.3	2.8	
II. Erratic fertilizer application, transport cost depending on the distance of local market, low seed									
Effium	6.4	42,934	20,000	6,250	9,000	8,400	0	19,605	106,189
Makurdi	2.4	14,250	20,000	2,000	5,000	3,500	2,000	7,875	53,250
Jalingo	1.3	7,900	18,235		12,353	0	235	2,472	41,237
Offa	3	14,870	30,480	2,540	20,320	11,430	7,620	0	72,400

Fertilizer applied in relation to yields

	HH	Fertilizer (bag/ha)	Yield (t/ha)	Profit (n/ha)
Kaduna, Zaria	1	8	15	96,060
	2	7	15	97,990
	3	6	12	79,670
	4	5	11.25	75,100
	5	4	10.5	58,780
	6	4	8.25	39,030
	7	3	9	45,710
	8	3	7.5	34,460
	9	2	7.5	32,640
Burukuru Benue	1	8.6	9.1	236,571
	2	8	12.8	366,000
	3	7.5	12.0	341,750
	4	4	6.4	175,000
	5	3.3	5.3	142,667
	6	2.5	4.0	99,250
	7	2	2.0	36,750
	8	1.7	4.0	107,667
	9	1.7	2.3	50,375
	10	1	2.5	60,438
	11	0	3.2	91,000
	12	0	2.4	63,500
	13	0	2.0	49,750
	14	0	1.9	45,167

Fertilizer applied in relation to yields, based on most villages

Fertilizer (Bag/ha)	Yield (Ton/ha)	# farmers
11	4.8	1
9	4.5	3
8 to 9	10.8	5
7 to 8	12.1	7
6 to 7	7.2	4
5 to 6	4.7	13
4	4.7	11
3 to 4	6.4	9
2.1 to 2.5	3.6	13
2	3.4	17
1.5 to 1.9	3.2	7
1 to 1.5	2.0	9
0	5.7	32

Seasons of production and price of fluctuation

	Season 1			Season 2			Season 3		
	Harvest months	% HH plant	Prices (n/bag)	Harvest months	% HH plant	Prices (n/bag)	Harvest months	% HH plant	Prices (n/bag)
I. sold to major city markets, price fluctuate with the major production areas in the country, usually in the form of low prices during the major harvest season in Oct-Nov									
Zaria	Jul-Aug	100	3,000	Oct-Nov	100	1,000	May	15	5,000
Abuja	Jul-Aug	15	3-3,500	Nov-Dec	100	2,500-2,800			
Asa	Jun-Jul	100	1,600-2,000	Oct-Nov	100	1,200-1,300	Dec-Jan	100	800-1,200
II. Mainly sold to local markets, prices not even and not fluctuate with national pric**es**									
Effium	Jun-Jul	100	2,500	No-Dec	100	4-4,500	Mar	100	3,000
Makurdi	Jul-Aug	70	4,500	Dec-Jan	100	1,500	Sept	38	2,400
Jalingo	Sep-Oct	60	3,000	Nov	60	1,500	Dec-Jan	82	2,500
Offa	AugSep	100	2,500-3,000	Dec-Jan	12	3,500-4,000			
Obi	Jul-Aug	100	3,000	Nov-Dec	100	3,000	Apr	15	4,000
III. SP mainly as a food crop, sold in local markets only, prices unrelated to national									

Varieties

	Bota	Apu	Other varieties	
	% area planted	% area planted	% area planted	# varieties
Type I. Growing 100% the varieties sought by the national markets				
Zaria,	100	0	0	
Abuja	100	0	0	
Asa, Kwara	0	100	0	
Type II. Not exclusively the national market varieties, but moving in this direction				
Effium, Ebonyi	0	75	25	2
Makurdi, Ben	0	0	100	3
Jalingo, Taraba	80	0	20	4
Offa, Kwara	0	0	100	3
Type III. Not oriented to growing national market varieties				
Obi,			5	

Mandatory and desirable marketing traits

- **Shelf life (deal breaker)**: at least 2-3 weeks to allow transport from the farm to the major city markets. Then from city wholesalers to retailers, and then onward to fryers and/or home consumers.
- Taste (mandatory): must taste sweet.
- Larger size (desirable)
- DMC: not specified by the farmers or other stakeholders on the chain, but it may be related to the length of the shelf life.
- Color: not mentioned as an issue

Seed procurement system

	% HH plant in dry season	# HH need to buy seed	Cost (n/ha) from neighbor	Cost (n/ha) from market	Specifics from each area
I. **Need large volume seed and many need to buy from market where prices are higher**					
Zaria	15	85	3,000	7,000	Livestock is a constraint
Asa, Kwara	0	100	None available	4,000	Scale of SP production and lack of lowland, buy by truckload
II. Some have ratoon seed, some get from neighbors, paid or free, some grow year round					
Effium	100	0	--	--	Most grow 3 seasons a year
Markurdi	29	55	10-30,000	10-30,000	Price varies with the variety
Jalingo	70	30	5,000	10-15,000	Vines from market cost more and worse quality
Offa	12	88	7,500	7,500	Mainly free exchange
Obi	15	0	--	--	Seeds from ratoon
Type III. Most get seed from ratoon, or buy a little from neighbor to supplement					

Marketing venues and transport costs

	Where	Sell to	Transport (n/bag)
I. **Traders collect from farm with trailers and farmers pay no transport**			
Zaria, Kaduna	At the farm	Local collector	0
Abuja	At the farm	National traders	0
Asa, Kwara	In market in capital city	Traders, collectors, consumers	200
II. **Most are sold in the market, some also sold to local collectors at lower**			
Effium, Ebonyi	At farm In market	L collector Middlemen	500
Markurdi, Benue	At farm In market	L collector Retail	300-750
Jalingo, Taraba	At farm In market	L collector Middleman	50-200
Offa, Kwara	At farm	National trader	0
Obi, Nassarawa	Local market	Collectors or retail	150-200
III. Almost all sold in local markets, to collectors or retailed, pay transport to market			
Burukuru, Ben	Local	L collectors	250

Characteristics and appropriate inventions for the three types of SP farmers

Characte-ristics	**Type I farmers**	**Type II farmers**	**Type III farmers**
Importance of SP	SP is the most important cash crop	SP as one of the top cash crops	SP not considered a cash crop, though still sold because it cannot be stored
Land allocated for SP	Large land area set aside for SP production	Land allocated to SP production vary	Small land area allocated for SP production
Purpose of SP	Specifically grown for cash income	Grown for cash and home consumption	Mainly for home, though also sell in local markets
Seed system	High volume seed needed and many need to buy from market where prices are higher	Most do not need to buy seed and those who do, buy, or get for free, from neighbors	Little seed is purchased, those who need to buy only need a little to supplement what they have

Characte-ristics	**Type I farmers**	**Type II farmers**	**Type III farmers**
Targeted market	Major national cities—Lagos, Abuja, Pt. Harcout, and Onitsia	Both national city markets and local markets	Almost exclusively local markets
Prices	Determined by harvests of other major production areas	Affected by other areas, but effects smoothed out by local demands	Unpredictable. Prone to more extreme low or high depending on local demand
Varieties	Specialize in one or two market varieties	Plant more than market varieties, but they are always the major ones	Not focused on market varieties, keep varieties for home consumption
Marketing	Most often collected directly from farm and no transport cost	Sell to local collectors or in the local market, transport cost can be high	Sold in the local markets, always pay transport cost which can be high

Constraints of each type of farmers

Type I farmers	Type II farmers	Type III farmers
• Ridging and weeding labor intensive and costly • Access to, and cost of, seed may be problematic • Prices susceptible to severe fluctuations • Relying on one variety could be risky	• Ridging and weeding are high • Limited income or profit from SP • Transport and time spent on marketing constitute a large expenses • Price fluctuations	• Ridging and weeding costs high • Low production and low income from SP • Transport and time spent on marketing an extra expense

Opportunities of each type of farmers

Type I farmers	Type II farmers	Type III farmers
Income increase through • Improved varieties • Improved production management Costs decrease through • Dry season seed maintenance • Organized marketing New opportunity • Large quantities of vines and the low-valued small roots are ideal for livestock development	Income increase through • Improved varieties • Improved production management Costs decrease through • Dry season seed maintenance • Organized marketing New opportunity • Enough vines and small roots for livestock development for some	• OFSP could improve family health • Yield and income improved through production management • Cost decrease through organized marketing

Function and Profit of Type I local collectors

	Cost (n/bag)	Income (n/bag)
Bags	100	
Bagging roots	70	
Transport to the road	100	
Loading onto truck	60	
Total cost	330	
Collecting price		500
Net profit		170
Total income (n/week)		127,500

- Several local collectors in a village—only Type I villages
- Farmers can only sell through these collectors, not traders directly
- Each collector has relationships with several traders.
- **They decide what variety can be marketed—gatekeeper to**

Function of Type II local collectors

Collecting from	Selling to	
	Sold by bags (small quantity)	Sold in heaps (most of the roots)
• Various villages • Local markets	• Housa collectors (1) • Ibo collectors (**2)** • Euroban collectors (3) • Lagos (only 2x a year)	• Fryers/processors (60%) • Sold for gunu or to small restaurants to make cassava/SP flour

Lower profit of Type II local collectors

	Buying prices (n/bag)	Transport cost (n/bag)	Selling prices (n/bag)		Total income (n/week)
			Sell by the bag	Sell by heaps	
Large roots	3,000	450	5,000	7,000	=(1,550 + 3,550 + 3,550)*7= 60,550
Mixed sized roots	2-2,200	450	4,000	6,000	

National traders

- Familiar with the harvesting schedule in all major production areas
- Collect from local collectors and farmers
- Hire transport and pay according to the distance
- Selling to wholesalers in major markets
- Will only collect Apu and Bota, which are the only ones accepted by wholesalers

The traders' profits

	n/bag	# bags/trailer	Total (n/trailer)
SP cost	3,200	260	832,000
Loading bags	300	260	78,000
Transport (Kano-Lagos)*			300,000
Offloading in Lagos market			7,000
Parking tax in market			4,500
Total costs to trader			1,221,500
Total sales to wholesalers	5,300	260	1,378,000
Profit per trailer			**156,500**
Profit per bag (n/bag)			**602**
Total profit per week			

Wholesaler function and income

- Function
  - Occupy a space in the wholesale market
  - Often 1-3 wholesaler share a trailer per week
  - Traders trailer arrive, wholesaler inspect the roots for rotting roots
  - Local collectors buy from wholesale by bags or less than a bag
- Profit and income
  - Buying: 5,300 n/bag
  - Selling to retailers: 5,800 n/bag
  - Profit: 500 n/bag
  - Net income per week at 1 trailer per week: 130,000 n/week

The retailers' function and profit

- Retailers buy a bag or less from wholesale, of the same market or not
- Sort roots by sizes, and sell in heaps
- Profit per bag is sizable, but generally only 2-4 bags per week

Costs (n/bag)	Sales (n/bag)
Buying roots = 6,000	Large root heaps= 300 n/heap * 10 heaps = 3,300 n
Sorting/wheel barrel moving = 100	Med root heaps = 200 n/heap * 39 heaps= 7,800 n
Transport (if not in the same market) = 500	Small root heaps= 100 n/heap * 10 healps= 1,000 n
Total costs = 6,600	Total income = 11,800
Net profit (n/bag)= **5,200**	Net profit (n/week) = 5,200 *3 = **15,600**

Agro-processor

- High % of SP consumed this way, but not as high as in Ghana
- Peel roots (often done by children), cut into chips
- Fry along side yam and banana, or chickpea flour balls
- Express little concern for oil absorption or color perhaps because only 1-2 var in the market
- Sell for 5 n/chip ($0.033 vs. $0.1 in Burkina) with sauce
- Very reasonable profit and income

The processors' profit

Costs (n/2 basin/day)		**Costs (n/bag/day)**	
Buying roots =	2,000	Buying roots =	3,000
Firewood =	150	Firewood =	225
Oil = 750		Oil = 1,000	
Sauce = 75		Sauce = 100	
Space rental=	400	Space rental= 400	
Total costs =	3,375	Total costs = 4,725	
Income/profit (**n/2 basin/day**)		**Income/profit** (**n/bag/day**)	
Sales income (n/day) = 9,720		Sales income (n/day)= 14,533	

Market size and profit of each chain actor

Market size/ profit	Local collector	National trader	Wholesaler	Local collector/ retailer	Retailer	Processor
(bag/week)	750	520	260	3	3	7
(n/bag)	170	600	500	1,500-3,000	5,200	9,800
(n/week)	127,500	313,000	130,000	60,500	15,600	68,656

Main objectives of proposed interventions

- Overcome current constraints to profits
  - To increase income with improved varieties
    - High--yielding
    - Early maturing or long season for higher prices
  - To decrease costs
    - Fertilizer
    - Transport
    - Ridging & weeding
- Capitalize on opportunities by diversifying products
  - To diversify income sources
  - To improve health and diet

Propsed products for the appropriate producers

	Fresh root as cash crop	SP as Livestock feed	OFSP as nutrition product
Appropriate farmers	• Type 1 • Type II	• Type 1 (all) • Type II (some)	• Type III
Why the product is suited for certain types of farmers	Interventions may make SP more profitable to these farmers to whom SP is a major income source	This product chain is suited for farmers who have large amounts of vines at harvest, and small roots which command low prices, both would yield higher value, with proper processing and feeding technology, as	OFSP is difficult to be accepted by the fresh market, but has potential to improve nutritional status as a home consumption production. OFSP is appropriate for Type III farmers mainly grow SP for

Suggested products and interventions

	As cash crop	As nutrition crop	As livestock feed
Breeding	1. Breeding for market-accepted high-yielding, early maturing, long-season, weevil-resistance 2. Regional germplasm evaluation		Selection for dual-purpose—total biomass from root and vines, **if such interest exists.**
Seed system	1. Multiply and sell seed of improved varieties for market via existing seed supplier.	Multiply and sell OFSP varieties via existing seed supplier.	Multiply and sell seed of dual-purpose varieties for market via existing seed supplier.

	As cash crop	As nutrition crop	As livestock feed
Production improvement	1. Fertilizer trials to determine the optimal fertilizer application for the introduced varieties. 2. Ways to decreased ridging labor (establish tractor rental enterprise?) 3. Experiment on overall best ICM practices.	1. Fertilizer trials to determine the suitable fertilizer investment for food security crop (no cash income) 2. Same 3. Same	1. Fertilizer trials to determine the most appropriate practices to obtain the highest volume of vine & root biomass and livestock nutrition 2. Same 3. Same

	As cash crop	As nutrition crop	As livestock feed
Postharvest	1. Harvest method to minimize damage and improve quality 2. Assessing postharvest loss to transport and ways to minimize loss 3. Experiment fresh root storage methods for 1-2 months	1. Introduce cooking and eating practices appropriate within local food consumption practice to enhance nutrition	1. Experiment with various vine silage treatments (also with roots, should interest exists, for the times when fresh roots prices are too low to sell. 2. Feeding trials with silage 3. Experiment with holistic system of crop feed and soil maintenance with intensified animal manure application

	As cash crop	As nutrition crop	As livestock feed
Marketing	1. Linking producers with collectors for direct collection 2. Establish local collection center	1. Awareness campaign to introduce the benefits of OFSP	

Thank you