

SWEETPOTATO VALUE CHAIN ASSESSMENT BURKINA FASO



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Sweetpotato production

Province	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012
Kéné Dougou	45,135	33,643	32,040	40,761	29,819
Sissili	7,058	11,094	31,241	23,214	82,138
Nahouri	3,270	12,339	1,761	6,625	6,937
Kouritenga	-	2,311	4,458	3,904	-
Gourma	3,728	6,127	2,949	8,333	528
Léraba	1,013	981	2,779	3,313	6,239
Banwa	-	1,896	3,254	1,638	11,708
Total	60,204	68,392	78,483	87,786	137,370

* National statistics

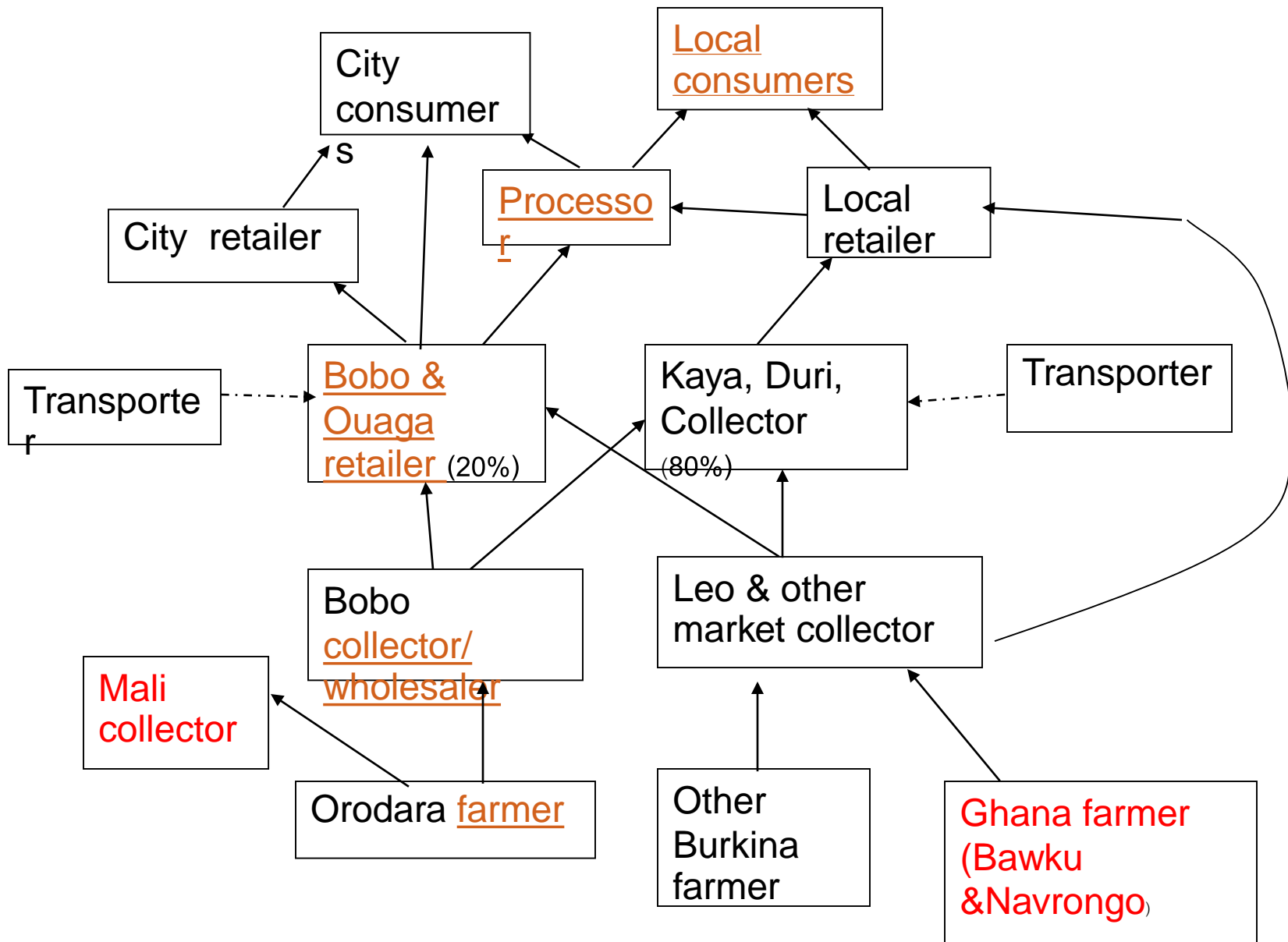
Sweetpotato marketing

	White	Red	Orange
Skin	White	Red	Red
Flesh	White	White	Orange
% market share	98		
Yield	21.5	28.7	10.8
Price	2,000	2,250	2,250
Harvest season	Nov-Feb	Nov-Mar	Aug - Nov
Preferred characteristics	High DM, sweet	Somewhat sweet	Sweet, color

GENERAL OVERVIEW

- Producers have a fairly long history of growing SP as a cash crop – medium: 15 years
- Production increasing each year due to market demand
- Due to perishability, mainly a cash crop, since 15 years ago
- Two major market accepted varieties, and OFSP introduced, and accepted in market in recent years
- Two major production and collection areas, one borders Mali and one borders Ghana
- Main consumption areas NOT in cities, but other provinces, as staple food, not snack
- Mainly just one season, except a few pockets of irrigated dry season crop
- Monocropping, no intercropping





Sweetpotato value chain in Burkina Faso



Characteristics of the sweetpotato producers

	Land area (ha/P)	SP area (ha/hh)	SP of total land (%)	SP sold (%)	SP variety grown (#)	Yrs as cash
Sikorla	0.7	5.0	36.6	98	2	10
Koupela	0.5	3.4	27.7	98	1	25
Banzon	0.3	1.1	32.6	77.5	2	2
Muna	0.8	1.4	19.8	95.4	5	15
Tiebele Dry	0.3	0.4	14.1	95.4	10	15
Seiga	0.4	0.7	17.4	91.9	3	15
Sanwabo	0.4	0.7	19.2	89.4	3	0
Boura	0.7	0.4	9.7	82.7	1	2
Tiebele Rain	0.3	0.3	9.8	95.4	10	15
Average	0.5	1.5	20.8	91.5	4.1	12.0

Crop importance ranked by income versus food security

	By income (for cash)	By land area (for food security)		By income (for cash)	By land area (for food security)
Sikorla	1. SP 2. Cotton 3. Maize	Maize Sorghum Rice	Seiga	SP Peanut Rice	1. Sorghum/M 2. SP 3. Peanut
Koupela	1. SP 2. Rice 3. Maize	1. Sorghum 2. Maize 3. Rice	Sanwaba	Peanut Cotton Sesame	Sorghum/Millet Peanut Maize
Muna	1. SP 2. Maize 3. Peanut	1. Maize 2. SP 3. Peanut	Banzon	SP Rice Maize	1. Rice 2. SP 3. Maize
Tiebele	SP Peanut Sesame	1. Maize 2. Rice 3. SP	Boura	1. Peanut 2. SP	1. Maize 2. Sorghum/M 3. Peanut

Profits and income

	Fertilizer (bag/ha)	Yield (ton/ha)	SP profit (F/ha)	Income (F/hh)	Income (F/P)
Tiebele dry	5.2	14.7	938,573	405,813	42,612
Sikorla	3.7	24.7	965,449	4,670,475	219,763
Koupela	3.8	30.0	879,106	3,396,364	131,184
Banzon	3.9	18.8	721,662	725,534	54,124
Muna	3.0	16.8	478,778	639,098	62,167
Seiga	2.7	16.3	500,287	401,760	40,608
Sanwabo	2.6	14.9	445,918	385,337	37,821
Boura	1.8	5.6	138,741	51,004	10,843
Tiebele rain	3.2	8.4	49,350	27,668	5,414

PROFITS AND INCOME

- Profits determined by costs, prices, and yields
- Yields highly related to variety and fertilizer application
- Prices do not vary greatly across region, so mainly affected by yields
- Income (hh or pp) determined by the amount of cultivation land



Sweetpotato production and marketing costs (F/ha)

	Fertilizer	Ridging	Planting	Weed	Harvest	Seed	Transport	Total
Sikorla	53,529	120,000	35,000	36,000	Family	0	0	244,529
Koupela	76,788	Family	Family	Family	Family	17,924	149,818	244,530
Banzon	74,964	15,000	10,000	22,500	30,000	4,031	0	156,524
Muna	52,083	100,000	Family	12,000	Family	28,571	64,286	256,940
Tiebebe	99,487	50,400	16,800	0	48,000	70,846	50,200	285,052
Seiga	54,800	Family	Family	Family	Family	73,333	94,847	214,180
Sanwab	52,528	Family	Family	Family	Family	57,917	86,624	189,131
Boura	29,750	15,000	Family	Family	Family	1,688	6,119	52,556

COSTS SUMMARY

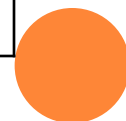
- Fertilizer, seed, and transport make up 70% of total costs, how can these activities be made more efficient?
- Ridging and harvesting require most labor (or cash) input
- Much of the labor is covered by family and community exchange
- Often a youth crop due to the heavy labor requirement for ridging and harvesting



Fertilizer applied in relation to yields

Fertilizer (bag/ha)	Yield (ton/ha)	# farmers
8	34	2
6 to 7	24.4	11
5	31.3	4
4	20.5	42
3 to 4	19	15
2.5 to 3	17.6	8
2 to 2.4	11.2	21
1 to 2	10	8
0	8.1	7

*Most of the farmers who apply low level, or no, chemical fertilizer usually apply organic fertilizer



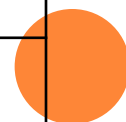
Seed system

	% HH maintain seed in garden thru dry season	# HH need to buy seed	Full cost of seed (F/ha)
Sikorla	100	0	0
Koupela	100	100	100,000
Muna	64	78.6	100,000
Tiebele	100	0	0
Seiga	40	90	75,000
Sanwabo	100	83.3	100,000
Banzon	73	45	15,000
Boura	75	25.0	100,000
Tiebele	100	80	200,000

Seed suppliers are most appropriate to multiply, introduce, and sell seed of improved varieties

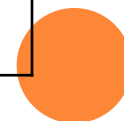
Transport cost

	Where	Sell to	Transport cost (f/bag)
Sikorla	Farmgate	Collectors/ wholesaler	0
Banzon	Farmgate	Collectors/ wholesaler	0
Koupela	In market >80 km	Collector/ retailer	400 – 600/sm bag
Seiga	Fada market	Collector/ retailer	500/sm bag
Muna	Leo market	Collector/ retailer	15,000/tractor =450 F/lg bag
Tiebele	Po market	Collector/ retailer	100/basin =400 F/lg bag
Boura	Leo market	Collector/ retailer	275/sm bag



Production seasons

	Plant	Harvest
Sikorla	June-Aug	Nov-Mar
Koupela	May-June	Sept-Jan
Banzon	May-Aug	Nov-Mar
Muna	Jun-Aug	Sept-Dec
Tiebele dry season	Jan-Feb	May-June
Seiga	May-Aug	Sept-Dec
Sanwabo	Jun-Jul	Oct-Nov
Boura	June-Jul	Aug-Oct
Tiebele rainy season	Jun-Jul	Sept-Oct

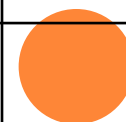


- Majority planted in Jun-July resulting in peak harvest Oct-Nov
- Minority manage to plant in May and harvest by Sept
- Another small portion able to plant in Aug and harvest in Dec
- Jan – Mar harvest only in Orodara



Seasonal fluctuation of prices

	Sept	Oct	Nov	Dec	Jan	Feb	Mar	May	June
Koupela (F/sm B)	4,500	2,500	1,500	5,000	5,000				
Koupela (F/kg)	56.3	31.3	18.8	62.5	62.5				
Sikorla (F/trailer)			550,00 0	800,00 0	800,00 0	850,00 0	850,00 0		
Sikorla (F/kg)			39.5	57.1	57.1	60.7	60.7		
Banzon (F/trailer)		625,00 0	375,00 0	425,00 0	1 m				
Banzon (F/kg)		30.4	26.8	44.6	71.4				
Seiga (F/ sm bag)	6,000	2,500	2,500	5,000					
Seiga (F/kg)	75	31.3	31.3	62.5					
Sanwabo (F/sm B)		2,500	2,500						
Sanwabo (F/kg)		31.3	31.3						
Muna (F/ lg bag)	15,00 0	6,500	7,000	10,000					
Muna (F/kg)	93.8	40.6	43.8	62.5					
Boura (F/ sm									




Characteristics of the three varieties sold in the market

	White	Red	Orange
Skin	White	Red	Red
Flesh	White	White	Orange
% area	98		
Yield	21.5	28.7	10.8
Price	2,250	2,000	2,250
Harvest season	Nov-Feb	Nov-Mar	Sept - Dec
Weevil attacks	Susceptible	Resistant	Highly susceptible
DMC	High DM	Lower DM	Lower DM
Taste	Sweet	Less sweet	Sweet

Bobo wholesale market

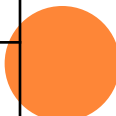
- No permanent wholesaler based at the market
- Work in groups of 3. Collect and wholesale
- Rent 7-ton trailer to collect & wholesale in Bobo market to collectors from the provinces
- Buy by the trailer, can pack into 86 bags of 160 kg/bag, approx 14 ton per trailer
- Also retail while waiting to load the trailer

# trailer/day	# ton/trailer	# days	Volume (ton/yr)
13	13.76	180	32,198



Collector/wholesaler profit and income

Expenses (F/trailer)		Sales (F/trailer)
Sweetpotato	400,000	559,000*
Trailer rental	100,000	
Loading at farmgate	10,000	
Off loading in market	4,000	
Bagging in market	10,000	
Market tax	3,000	
Total costs	527,000	
Profit (F/trailer)		330,000
#trailer/mo/collector		18
Income (F/mo/3 collector)		5,994,000



Sweetpotato retailing in Ouagadougou

	Sangkariyari market		Toecin market		Pagalayuni market	
	Peak Season	Off season	Peak Season	Off season	Peak Season	Off season
# sellers	20	6	30	15	12	2
Bag/day	1	0.3	1	0.5	0.43	0.03
Buying price*	7,500-10,000	15 - 20,000	10-12,000	12,500 - 15,000		12,500



Estimated sweetpotato volume Ouagadougou markets

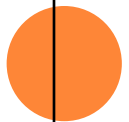
	Peak season	Off season
Avg # seller/mkt	12	4
Total # seller	300	100
Avg bag/day	0.5	0.1
# bag/season	22,500	1,500
Total kg/season	3,600,000	240,000
Total ton/year	3,840	

- As estimated by collectors, small volume marketed in Ouaga and Bobo
- Most sweetpotato sold and consumed in other provinces as staple food. OFSP well accepted and even preferred.



Ouagadougou retailers' profit and income during off season

Costs (F/bag)	Sales (F/bag), net income based on 0.5 bag/day
Average buying price = 11,000 F/bag	Large root heaps= 500 F/heap * 9 heaps = 4,500 F
(Transport cost included in the buying price)	Med root heaps = 200 F/heap * 32 heaps= 6,400 F
	Med-small root heaps = 100 F/heap * 100 = 3,000 F
	Small root heaps= 150 n/heap * 15 heaps= 2,250 F
	Total income (F/bag) = 16,150
Net profit (F/bag)= 5,150	Net income (F/month/retailer) = 3,150 *15 = 77,250



Bobo retailers' profit and income during off season

Costs (F/bag)	Sales (F/bag), net income based on 1 bag/day
Average buying price = 11,500 F/bag	Large root heaps= 500 F/heap * 5 heaps = 2,500 F
(Minimal local transport cost included)	Med root heaps = 200 F/heap * 32 heaps= 6,400 F
	Small root heaps= 50 F/heap * 15 heaps= 750 F
	Total income (F/bag) = 9,650
Net profit (F/bag)= 1,250	Net profit (F/month/retailer) = 1,150 *30 = 34,500

- Retail prices almost half price as Ouaga—twice the roots per heap for the same price as in Ouaga



Fryers in Banzon and Bobo

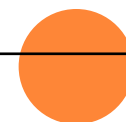
Banzon fryer	Bobo fryer
Costs (F/small bag/day)	Costs (F/large bag/3 day)
Buying roots = 1,500	Buying roots = 8,000
Oil = 714	Oil = 3,600
Sauce = 100	Salt + pepper = 225
Space rental= 1.2	Space rental= 52.5
Total costs = 2,315	Total costs = 11,728
Income/profit (F/sm bag/day)	Income/profit (F/bag/3 day)
Sales income (F/day) = 2,960	Sales income (F/3 day)= 12,650
Net profit (F/day) = 645	Net profit (F/3 day) = 923
Net profit (F/month) = 19,338	Net profit (F/month) = 9,230

Fryers buy a bag of sweetpotato and cut into chips and sell each for 5 F. Usually sell two other products along with sweetpotato chips



Summary of the market size, profit, and monthly income of each actor

	Bobo wholesaler		Retailer		Fryer	
			Bobo	Ouaga	Banzon	Bobo
Vol (trailer/mo)	18	Vol (bag/day)	1	0.5	1 small	0.3 large
Profit (F/trailer)	333,000	Profit (F/bag)	1,250	5,150	645	923
Income (F/mo)	5,994,000	Income (F/mo)	34,500	77,250	19,336	9,230



CONSUMERS

- 80% consumed in the provinces as staple
- Mainly boiled as staple, smaller percentage fried
- Frying characteristics not a concern, low DM of OFSP not a concern
- Consumers prefer the color of OFSP and willing to higher prices for them
- Implications:
 - OFSP is the accepted in market in Burkina without needing any media campaign
 - OFSP produced in Navrongo and Bawku can be marketed in Leo and Po

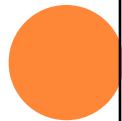


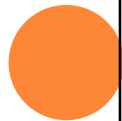
MAIN OBJECTIVES OF PROPOSED INTERVENTIONS

- Overcome current constraints to profits
 - To increase income with improved varieties
 - High--yielding
 - Early maturing or long season for higher prices
 - To increase income by storing roots for 1-2 months
 - To decrease costs
 - Fertilizer
 - Seed
 - Transport
 - Ridging & harvest
- Capitalize on opportunities by diversifying products
 - To diversify income sources
 - To improve health and diet



Suggested products and interventions

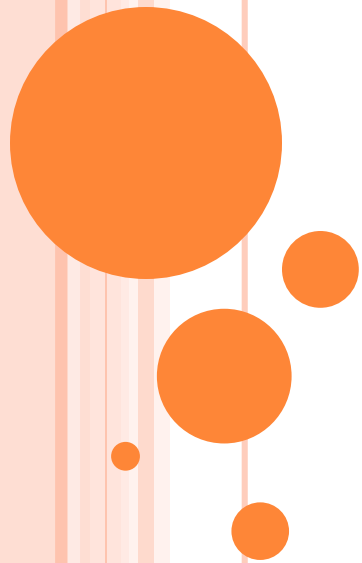
	As cash crop	As nutrition crop	As livestock feed
Breeding	<ol style="list-style-type: none"> 1. Breeding for market-accepted high-yielding, early maturing, long-season, weevil-resistance 2. Regional germplasm evaluation 	<p><u>High yielding OFSP</u></p>	<p>Selection for dual-purpose—total biomass from root and vines, if such interest exists.</p>
Seed system	<ol style="list-style-type: none"> 1. Multiply and sell seed of improved varieties for market via existing seed supplier. 2. Ways to assist more 	<p>Multiply and sell OFSP varieties via existing seed supplier.</p>	<p>Multiply and sell seed of dual-purpose varieties for market via existing seed supplier.</p> 

	As cash crop	As nutrition crop	As livestock feed
Production improvement	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 1. Fertilizer trials to determine the suitable fertilizer investment for food security crop (no cash income) 2. Same 3. Same 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 1. Introduce cooking and eating practices appropriate within local food consumption practice to enhance nutrition 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none">1. Linking producers with collectors for direct collection2. Establish local collection center	<ol style="list-style-type: none">1. Awareness campaign to introduce the benefits of OFSP	





THANK YOU

OFSP in relation to other varieties

	Nakam Ponggu	Nakason	Bangerei	Tai Ling (Tai Nong)*
Skin	White	Red	Yellow	Yellow
Flesh	White	White	Yellow	Orange
# growing it	15	15	10	5
Yield (# Basin)	150	150	70	60
Price (Sept)	1,500	1,500	2,250	2,250
Areas planted (%)	60	20	10	< 5
Resistance to weevils	Susceptible	Resistant		Highly susceptible

There are 10 varieties grown in Tiebele, and three of which take up 90% of the planting areas, leaving the other seven, the OFSP included, making up the rest of the 10% of area