

Enhancing Food Security in South Sudan: The Role of Public Food Stocks and Cereal Imports

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Outline

- Introduction
- Historical Background and Overview of the Agricultural Economy
- Cereal Production, Consumption and Imports
 - Production estimates
 - Consumption patterns and demand parameters
 - Trade flows
- Cereal Markets and Prices
 - Border prices and co-integration analysis
 - Partial equilibrium model simulations
- Options for a National Strategic Food Reserve System
- Summary and Conclusions



Introduction

- Since achieving independence in 2011, South Sudan has continued to face daunting problems of food insecurity and civil conflict.
 - A difficult physical environment, with low levels of rainfall and fragile soils
 - A lack of direct access to sea ports and major markets
 - A legacy of three decades of civil war and violence (1983 to 2005) that resulted in approximately two million deaths, massive population displacement, low levels of investment in infrastructure, economic stagnation and widespread poverty.



Introduction

- Emergency food aid has long been a major component of food supply and a centerpiece of national and donor strategy to address food insecurity in South Sudan.
 - Food aid inflows increased from 21 thousand tons in 2011 to 109 thousand metric tons in 2012.
- In 2013, private sector imports of maize, sorghum and other cereals from Uganda may have reached 1 million tons or more (30 to 50 percent of total supply), replacing flows of sorghum from northern Sudan as a major source of cereal supply



South Sudan: Key Events

1983	Civil War breaks out in the South between Government Forces and the Sudan People's Liberation Movement (SPLM).
2005	The National Congress Party (NCP) and SPLMA signed the Comprehensive Peace Agreement (CPA) to end the civil war.
2011	The Referendum is held and Southern Sudanese vote for their independence. South Sudan becomes a country.
2012	South Sudan halts oil production after talks on fees for the export of oil break down.
2013	War starts between those aligned with President Salva Kiir and those loyal to his former Vice President, Riek Machar.



South Sudan: Economic Structure

	South Sudan	Sudan	Ethiopia	Uganda
Population (mn)	11.30	37.96	94.10	37.58
% Pop in Largest City	14%	38%	17%	31%
% Urban Population	19%	34%	19%	16%
GDP pc, PPP (Bn US\$)	1964.62	3903.29	1335.73	1620.58
GDP, PPP (bn US\$)	22.19	148.19	125.69	60.90
GDP growth (annual %)	13.13	3.31	10.49	3.27
Life expectancy at birth	55.24	62.04	63.62	59.19

Source- (Above) Population, GDP, and life expectancy data is from the World Bank Open Databank. Maize and sorghum production data is from FAOSTAT, cereal production data is from the 2014 WFP CFSAM. (Below) South Sudan National Bureau of Statistics





South Sudan: Agro-Ecologies



Source: Diao, Xinshen, Liangzhi You, Vida Alpuerto and Renato Folledo. 2011. "Current Condition and Agricultural Potential in South Sudan" unpublished report funded by the World Bank (June, 2011).



Cereal Production

- Data on crop area and production for South Sudan is limited
 - The Government of South Sudan provides estimates of crop production
 - FAO/WFP provides estimates of crop production
 - Neither of these estimates are based on nationally representative farm surveys
 - The 2009 National Baseline Household Survey (NBHS) can also be used to construct indirect estimates of production



Cereal Production and Requirements, 2008/09 – 2014/15

	Area	Yield	Net Production	Cereal Requirement	Per capita Requirement	Population
	('000 ha's)	(tons/ha)	('000 tons)	(tons)	(kgs/person)	(mns)
2008/09	n.a.	n.a.	1002	953	98.0	9.727
2009/10	852	0.78	660	885	99.2	8.924
2010/11	921	0.75	695	986	107.7	9.158
2011/12	860	0.65	563	1036	107.6	9.634
2012/13	1141	0.67	761	1132	109.2	10.369
2013/14	1173	0.76	892	1301	109.3	11.901
2014/15	1014	1.00	1015	1264	110.5	11.433
Growth Rate						
2009/10-14/15	5.5%	3.8%	9.6%	8.0%	1.7%	6.2%

Notes: "Cereal requirements are based on state level data from the 2009 National Baseline Household Survey at state level, with adjustments "to take into account differences between urban and rural areas and the relative importance in local diets of other crops (notably cassava and groundnuts), livestock and wild foods" (WFP CFSAM, 2014, p. 31.).

Source: FAO/WFP. various years. "Crop and Food Security Assessment Mission to South Sudan (CFSAM)." Special Report.



South Sudan Estimated Cereal Production and Imports, 2009

	Maize	Millet	Rice	Sorghum	Wheat	Total
Production 2009 ('000 tons)						
Estimate I: NBHS/IFPRI	175.2	36.6	8.4	769.5	5.0	994.8
Rural	173.1	36.3	7.6	749.3	5.0	971.3
Urban	2.1	0.3	0.8	20.2	0.0	23.5
Estimate II: FAO total prod	145.4	30.4	7.0	638.5	4.2	825.3
Consumption 2009 ('000 tons)						
Estimate I: NBHS						
Rural	233.8	43.3	14.4	893.1	8.4	1193.0
Urban	62.9	2.2	12.3	91.6	10.5	179.5
Total	296.7	45.5	26.7	984.6	18.9	1372.4
Consumption (kg/person/yr)						
Estimate I: NBHS						
Rural	33.0	6.1	2.0	126.0	1.2	168.3
Urban	47.9	1.7	9.4	69.8	8.0	136.8
Total	35.3	5.4	3.2	117.2	2.3	163.4
Net imports						
Estimate I: Using NBHS/IFPRI Proc	b					
Net Imports ('000 tons)	150.7	15.0	19.7	343.4	14.8	543.5
Imports / Consumption	50.8 %	32.9%	73.8%	34.9%	78.0%	39.6%
Urban Purchases / Total Imports	40.3%	13.0%	58.2 %	20.8%	70.8%	28.7%
Estimate II: Using FAO Prod						
Net Imports ('000 tons)	175.6	20.2	20.9	452.6	15.5	684.7
Imports / Consumption	59.2 %	44.4%	78.2%	46.0%	81.7%	49.9 %

Source: NHBS, WFP CFSAMs (various years) and authors' calculations.

Cereal Production and Requirements



Source: WFP CFSAM (various years) data.



Cereal Production

- Production data for 2013 suggest a shift in crop production.
 - The share of maize in total production of cereals rose from 18 percent in 2009 to 30 percent in 2013.
 - The share of sorghum in net cereal production fell from 77 percent in 2009 to 64 percent in 2013.
- This shift in crop production from maize to sorghum has been accompanied by the continued production of other cereals such as wheat, millet, and rice.
 - Net production of millet, rice, and wheat increased by 69, 40, and 40 percentage points respectively.



Estimated Cereal Production,

Consumption and Imports, 2009 and 2013

	Maize	Millet	Rice	Sorghum	Wheat	Total
Net Production						
2009 (FAO/WFP)	121	25	6	532	3	688
2013	282	79	8	590	5	964
% change 2009-13	133%	212%	40%	11%	40%	40%
Imports (est.) 2009	176	20	21	453	15	685
Uganda Official Exports 2009	94	n.a.	38	11	n.a.	n.a.
Imports 2013	583	0	238	317	189	1327
Uganda Official Exports 2013	122	n.a.	71	55	n.a.	n.a.
Consumption						
2009 (NHBS)	297	45	27	985	19	1372
2013 (calculated)	864	79	246	907	194	2291
% change 2009-13	191%	74%	823%	-8%	924%	67%
Consumption Shares						
2009 (NHBS)	21.6%	3.3%	1.9%	71.7%	1.4%	100.0%
2013 (calculated)	37.7%	3.4%	10.8%	39.6%	8.5%	100.0%
% point change 2009-13	16.1%	0.1%	8.8%	-32.2%	7.1%	0.0%
Per Capita Consumption						
(kgs/person/year)						
2009 (NHBS)	35.3	5.4	3.2	117.2	2.3	163.4
2013	75.1	6.9	21.4	78.7	16.8	198.9
% Change (2009-13)	113%	27%	574%	-33%	647%	22%

Source: Authors' calculations and Food Security and Nutrition Working Group, East Africa Crossborder Trade Bulletin, January 2014, p. 7. http://www.fews.net/sites/default/files/documents/reports/Quarterly%20GHA%20Cross%20Border%20Trade%20Bulletin%20January%202014. pdf



Consumption Patterns: Rural, Urban, and all South Sudan (Monthly)

	Number of Consumers	Quantity (kgs/person/	Expenditures (SDP/person/	Budget Share (percent/
	(percent)	month)	month)	month)
Rural				
Sorghum	86%	11.07	21.20	24.04
Maize	28%	2.63	3.68	4.25
Wheat	25%	0.48	1.95	1.45
Rice	9%	0.25	0.88	0.64
Total	96%	14.44	27.70	30.37
Urban				
Sorghum	78%	6.87	15.86	9.92
Maize	41%	3.70	6.31	3.55
Wheat	75%	2.92	10.38	4.93
Rice	43%	0.91	3.08	1.31
Total	98 %	14.40	35.63	19.71
All South Sudan				
Sorghum	85%	10.26	20.17	21.32
Maize	30%	2.84	4.18	4.11
Wheat	33%	0.95	3.57	2.12
Rice	15%	0.38	1.30	0.77
Total	97%	14.43	29.23	28.32

Source: Calculated from NHBS, 2009.

Notes: Wheat includes bread, pasta and other wheat products.



Consumption Patterns: Juba

	Number of Consumers	Quantity (kgs/person/	Expenditures	Budget Share
	(percent)	month)	(SDP/person/month)	(percent/ month)
Bottom 60%				
Sorghum	47%	3.24	6.10	5.20
Maize	65%	4.73	8.36	6.46
Wheat	85%	1.74	6.23	4.80
Rice	28%	0.41	1.20	1.03
Total	98%	10.12	21.89	17.49
Тор 40%				
Sorghum	38%	3.64	6.02	2.57
Maize	73%	6.77	12.35	4.96
Wheat	91%	3.79	15.95	5.61
Rice	59%	1.34	4.82	1.35
Total	100%	15.55	39.14	14.48
Juba Total				
Sorghum	41%	3.49	12.21	3.58
Maize	70%	5.98	10.81	5.54
Wheat	88%	3.00	3.57	5.30
Rice	47%	0.99	3.43	1.22
Total	99%	13.46	30.03	15.64

Source: Calculated from NHBS, 2009. Notes: Wheat includes bread, pasta and other wheat products.



Monthly Average per Capita Cereal Consumption (Kgs/ Person), 2009

	Rural	North	Rural	South	Ju	ba	Other	Urban	Nati	onal
	Bottom 60%	Тор 40%								
Sorghum	11.29	13.74	8.46	10.30	3.24	3.64	6.66	9.34	9.85	10.99
Maize	2.26	3.22	2.52	3.48	4.73	6.77	1.88	3.34	2.38	3.65
Wheat	0.34	1.23	0.09	0.54	1.74	3.79	1.37	3.90	0.40	1.92
Millet	0.08	0.21	0.72	1.63	0.02	0.13	0.04	0.17	0.25	0.51
Rice	0.09	0.71	0.10	0.43	0.41	1.34	0.27	1.29	0.12	0.84
Other Cereals	0.15	1.52	0.86	1.71	0.57	0.96	0.23	0.47	0.36	1.27
Cereals	12.65	15.54	10.70	14.19	8.15	10.97	8.51	12.37	11.62	14.08

Source: Calculated from NHBS, 2009.

Notes: Figures shown are for the bottom 60 percent and top 40 percent of the national distribution of the total (food and non-food) per capita expenditure distributions.



Consumers of Cereals as Percentage of Total Consumers, 2009

	Rural North	Rural South	Juba	Other Urban	Total				
Sorghum Consumers									
Total Sorghum	92%	72%	60%	85%	85%				
Only Sorghum	49%	48%	51%	4%	44%				
Maize Consumers									
Total Maize	27%	29%	68%	30%	30%				
Only Maize	13%	20%	9%	11%	14%				
Wheat Consumers									
Total Wheat	27%	19%	77%	74%	33%				
Only Wheat	2%	6%	5%	3%	3%				
Other Cereals (Millet, Rice & Other) Consumers									
Total Other Cereals	16%	29%	45%	41%	23%				
Only Other Cereals	5%	25%	2%	2%	0%				

Source: Calculated from NHBS, 2009.



Source: Calculated from NHBS, 2009.



Consumption Patterns: Regression Results

- Data: 2009 Republic of Sudan National Baseline Household Survey (NHBS)
 - The NHBS was carried out in April and May of 2009
 - It covered 4,696 households across all ten states of South Sudan
 - All households who reported neither a quantity nor a value were dropped
 - All households who reported implausibly high or low levels of consumption defined by actual possible levels of consumption were dropped
 - A two- stage regression (Heckman) was used to address the censored-response problem
- From the regressions the following expenditure elasticities were calculated for sorghum and maize, 0.33 and 0.61 as well as the following own price elasticities, -0.22, and -0.15



Regional Cereals Trade

		Im	ports		Exports			
			South	Regional			South	Regional
Commodity	Uganda	Sudan	Sudan	Total	Uganda	Sudan	Sudan	Total
Maize	1,193	201	360,890	724,155	654,261	2,147	221	724,155
%	0%	0%	50%	100%	90%	0%	0%	100%
Rice	84,475	36	238,257	572,510	238,783	2,631	36	572,510
%	15%	0%	42%	100%	42%	0%	0%	100%
Sorghum	1,547	4,379	317,114	345,537	328,788	4,973	195	345,537
%	0%	1%	92%	100%	95%	1%	0%	100%
Maize Flour	139	-	221,643	232,566	219,054	3,283	-	232,566
%	0%	0%	95%	100%	94%	1%	0%	100%
Wheat Flour	46	164	188,907	213,110	181,359	2,458	179	213,110
%	0%	0%	89%	100%	85%	1%	0%	100%
Wheat	84	_	195	145,890	6,557	17	_	145,890
%	0%	0%	0%	100%	4%	0%	0%	100%

Source: Food Security and Nutrition Working Group, East Africa Crossborder Trade Bulletin, January 2014, http://www.fews.net/sites/default/files/documents/reports/Quarterly%20GHA%20Cross%20Border%20Trade%20Bulletin%20January%202014.pdf



Road Network and Check Points

	South Sudan	East Africa	Resource Rich Countries	Low- Income Countries
Classified Road Density (km per 1,000 sqkm of Arable Land Area)	15	101	57	88
Primary Network Paving Ratio (% roads)	2	-	82	72
Unpaved Road Traffic (Vehicles per Day)	53	47	54	39
Condition of National and Regional Roads (% in Good or Fair Condition)	5	59	80	86

	Distance (Km)	No. of Checkpoints (One Way)	No. of check- points per 100km
Juba-Aweil	746	32	4
Wau-Aweil	144	9	6
Juba-Wau via Mundri Wau-War- awar	602 198	24	4
Juba-War- awar	800	39	5
Juba-Bor	192	5	3
Juba-Kaya	235	12	5
Juba-Nadapal	338	11	3
Juba-Torit	128	4	3
Juba-Nimule	163	6	4

Source: World Bank. 2012. Agricultural Potential, Rural Roads, and Farm Competitiveness in South Sudan. Agriculture and Rural Development Unit. Report No. 68399-SS.

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Source: The Republic of South Sudan National Bureau of Statistics. 2011. South Sudan Cost-to-Market Report. An Analysis of Check-points on the Major Trader Routes in South Sudan, National Bureau of Statistics



Evolution of Market Prices

- Market prices of sorghum and maize have risen substantially over time and have also been highly variable.
 - Between 2009 and 2014, the price of sorghum in Juba rose by 81 percent in nominal terms (but dropped 14 percent in real terms).
 - In the same years, the price of maize rose by 92 percent in nominal terms (and fell 12 percent in real terms).
- Prices in Juba were on average **2.8 times** the average of the retail price in Kampala and Gulu.
 - The correlation coefficient between white maize retail and import parity prices in the Juba market was 0.844
 - The correlation coefficient between sorghum retail prices and sorghum import parity prices was 0.720.



Domestic and Import Parity Prices of Sorghum, 2008-15



Source: Authors' calculations from WFP Juba and FEWSNET data.



Domestic and Import Parity Prices of Maize, 2008-15



Source: Authors' calculations from WFP Juba and FEWSNET data.



Co-Integration Analysis

		ADF		ADF			ADI	F	ADF	
		(0 Lags		(11 Lags			(0 Lags w/	/	(11 Lags	
	VARSO c^	w/ Trend)	Stationary	w/ Trend)	Stationary	VARSO c^	Trend) Stationary	w/ Trend)	Stationary
	Levels			First Differences						
Maize										
Kampala(\$/Kg)	3, 1	-1.758	No	-2.112	No	0	-6.728	Yes	-2.438	No
Juba (\$/Kg)	1	-4.793	Yes	-2.408	No	0	-9.792	Yes	-3.181	No
Juba PM (SSP/Kg)	2, 1	-1.686	No	-1.919	No	0	-6.772	Yes	-2.531	No
Sorghum										
Gulu (\$/Kg)	5, 1	-2.031	No	-2.391	No	0	-8.739	Yes	-2.302	No
Kampala (SSP/Kg)	1	-2.05	No	-3.158	No	0	-8.020	Yes	-1.898	No
Juba (\$/Kg)	1	-3.94	Yes	-1.738	No	4	-10.548	Yes	-2.552	No
Juba PM (SSP/Kg)	3,1	-1.958	No	-2.013	No	1, 0	-7.667	Yes	-2.484	No
ADF Critical Values										
		-4.108		-4.178			-4.106		-4.13	
		-3.481		-3.512			-3.48		-3.491	
		-3.169		-3.187			-3.168		-3.175	

Source: Authors' calculations from FEWSNET data. Note: * Significant at 10%; ** Significant at 5%; *** Significant at 1%

- To test for co-integration the Engle-Granger two-step method is used
- Varsoc tests for lag numbers for which various indicators (FPE, AIC, HQIC and SBIC) have significant values
- Augmented Dickey-Fuller (ADF) tests with zero lags are used determine whether the series are stationary and ADF tests with 11 lags are used to test for possible seasonality.
- To determine whether the series can be co-integrated the first differences are also tested using Varsoc and ADF. If one of the series is stationary i.e. I(0) and the other one is I(1) they cannot be co-integrated.



Co-Integration Analysis: Results Sorghum

Dependent Variable	Indepdent Variable	Cointeg. Coeff.	Stand. Error	95% c.int. includes '1.0**	VARSOC # of lags^	ADF(0 lags) w/trend		ADF (11 lags) w/trend	
Juba (\$/Kg)	Gulu (\$/Kg)	0.530	0.131	No	3,1	-1.921	*	-1.816	*
Juba (SSP/Kg)	Kampala (SSP/Kg)	0.613	0.112	No	1	-2.401	**	-1.768	*
Juba PM (SSP/Kg)	Juba (SSP/Kg)	0.852	0.084	Yes	1	-2.26	**	-1.696	*
	ADF critical values								
	1%					-2.612		-2.628	
	5%					-1.950		-1.950	
	10%					-1.610		-1.608	

Source: Authors' calculations from FEWSNET data.

Notes: All prices are retail prices except Kampala prices which are wholesale

* Significant at 10%; ** Significant at 5%; *** Significant at 1%

*95 percent confidence interval for co-integrating coefficient includes 1.0.

[^] Lag numbers for which various indicators (FPE, AIC, HQIC and SBIC) have significant values

The statistical analysis indicates there is co-integration between Juba sorghum retail prices and both Kampala retail and import parity prices of sorghum.



Co-Integration Analysis: Results Maize

Dependent Variable	Indepdent Variable	Cointeg. Coeff.	Stand. Error	95% c.int. includes '1.0**	VARSOC # of lags^	ADF(0 lags) w/trend		ADF (11 lags) w/trend	
Juba (\$/Kg)	Kampala (\$/Kg)	-0.235	0.156	No	1	-1.486		0.135	
Juba PM (SSP/Kg)	Juba (SSP/Kg)	0.718	0.086	No	10, 1	-3.408	***	-1.263	
	ADF critical values								
	1%					-2.612		-2.628	
	5%					-1.950		-1.950	
	10%					-1.610		-1.608	

Source: Authors' calculations from FEWSNET data.

Notes: All prices are retail prices except Kampala prices which are wholesale

* Significant at 10%; ** Significant at 5%; *** Significant at 1%

**95 percent confidence interval for co-integrating coefficient includes 1.0.

[^] Lag numbers for which various indicators (FPE, AIC, HQIC and SBIC) have significant values

The statistical analysis indicates there is co-integration between Juba maize retail prices and Juba maize import parity prices.



Model Simulations: Model Structure

- Commodities: sorghum, maize, wheat/rice
- Model closure:
 - Domestic prices equal import parity prices; imports adjust to clear markets
 - Simulation 4: imports are exogenous; domestic prices adjust to clear markets
- Base data:
 - Assume import levels = 50% of reported levels: (sorghum: 261K, maize 332K, wheat/rice 319K, total 912K tons)

	Sorghum	Maize	Wheat/Rice
Elasticity of Supply	0.2	0.3	0.20
Income Elasticity of Demand	0.33	0.46	0.80
Own-Price Elasticity of Demand	-0.22	-0.24	-0.60



Model Simulations

	Sorghum	Maize	Wheat/Rice	Total
Imports ('000 tons)				
Base	158.56	291.27	332.81	782.63
S1. Prod shortfall	261.37	331.56	318.71	911.64
S2. Ex Price Shock	73.66	277.37	326.83	677.86
S3. Price shock/prod shortfall	183.20	316.78	308.83	808.80
S4. No priv trade: exog food aid	50.04	199.98	250.00	500.02
Consumption (percent change)				
S1. Prod shortfall	-2.0%	-2.8%	-4.8%	-2.9%
S2. Ex Price Shock	-4.8%	0.6%	-1.6%	-2.3%
S3. Price shock/prod shortfall	-7.2%	-3.0%	-7.6%	-5.8%
S4. No priv trade: exog food aid	-8.2%	-9.4%	-23.6%	-11.8%
Prices (percent change)				
S1. Prod shortfall	0.0%	0.0%	0.0%	0.0%
S2. Ex Price Shock	49.0%	22.0%	20.0%	31.4%
S3. Price shock/prod shortfall	49.0%	22.0%	20.0%	31.4%
S4. No priv trade: exog food aid	47.3%	51.2%	56.6%	51.9%

Source: Authors' calculations

Model Simulations; Percent Changes in Production and Consumption



Source: Authors' calculations

15.0%



Model Simulations; Import Levels (thousand tons)





Model Simulations: Summary

- Levels of cereal imports vary substantially across simulations, but in all cases import flows are large.
- Because demand for cereals is price inelastic, exogenous changes in import prices have relatively small effects on import demand.
- Substantial reductions in import flows could result in a major increase in domestic prices and substantial hardship to poor consumers.
- Maintaining these trade flows is crucial for food security in South Sudan.



Rationale for a National Food Security Reserve (NFSR) System

 There are widespread market and institutional failures.

 A large group of food insecure / vulnerable population that will need assistance in the foreseeable future.

 WFP carried out the emergency operations for decades but as a new nation, South Sudan needs to build its own capacity.



Potential Benefits of an NFSR

- Can mitigate the negative effects of the absence of a well-functioning market and the lack of infrastructure
- Can be an important part of the social safety nets programs
- Contribute to market development in the long run
- Can become part of the agricultural development strategy



NFSR: Challenges

An effective NFSR must overcome several severe infrastructural, institutional, and human capital constraints.

- Markets are spatially disintegrated due to inadequate infrastructure; very limited warehousing infrastructures; etc.
- Key elements of an effective reserve—such as early warning, crop forecasting, statistics on vulnerability and food insecurity, etc.—can be ensured only through strong institutions, which do not exist.
- Building this system will require a substantive pool of human resources, which will need time to develop.



Possible Design for an NFSR





Illustrative Cereal Distribution and Minimum Stock Targets

A Simple method of calculating a minimum stock:

- The average level of distribution per month with an adjustment for transport and delivery lags.
- If the lead time (for procurement, transport and delivery) is two months, in 2013 mean stock would have been 30 thousand tons.





Institutional / capacity building needs for NFSR

- Early warning and crop forecasting (initially done with the support of international organizations such as FAO and FEWSNET)
- Analytical support with respect to determination of stocks in the context of changes in the production scenarios, scaling up/ down of programs, introduction of new programs
- Analysis of market prices and availability and a clear transition or scaling up strategy
- Monitoring and evaluation; effectiveness of various programs (amount of various kinds of "leakages")



Proposed Administrative steps

- Formally creating the NSFR (through GoSS proclamation)
- Creation of an implementing agency within government, with a minimum core staff for initial operations.
- The construction of additional warehouses and the construction of larger warehouses at a central facility (most likely near Juba) would likely be needed within a few years of initiation of the food security stock.
- Partner with WFP to carry out NFSR operation in the early years, with a clear plan for the national agency to play the lead role in the planning, execution, and monitoring of operation.



Summary and Conclusions

- South Sudan is heavily dependent on cereal imports (mainly from the private sector), but the composition of cereal imports has changed after independence.
 - In 2009, our calculations indicate substantial flows of sorghum (apparently from northern Sudan) and minimal imports of rice and wheat
 - In 2013, FEWSNET trade data indicate that sorghum inflows have declined (though they still may have exceeded 300 thousand tons in that year), whereas maize, rice, and wheat imports have increased substantially.
- This cereal production and trade data for 2013 imply a major increase in the role of maize, wheat (including wheat products), and rice in the South Sudanese diet.
- More data is needed to confirm these changes.



Summary and Conclusions

- Given the missing market fundamentals, recurring shocks, and high vulnerability, South Sudan can benefit from a welldesigned National Food Security Reserve (NFSR) system.
- The purpose of an NFSR system would not be to displace the private sector nor to distort markets. Rather, the system could contribute to market development in the long run.
- The NFSR could also play a role in maintaining steady supplies for a targeted safety net to protecting the poor.
- Even with functioning NFSR, however, promotion of private sector domestic and import trade will remain crucial for ensuring adequate supplies of grain.



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