

Executive Summary



South Sudan presents a comprehensive portfolio of four priority value chain interventions requiring **\$200 million in total investment**. These strategic investments deliver exceptional financial returns ranging from **15% to 37% IRR** while generating transformative while generating transformative socioeconomic impacts across rural communities.

\$200M

Total Investment

Across four value chains

57,465

Direct Beneficiaries

Farming and fishing households

\$832

Average Income Increase

Per household annually

5M

Emission Reduction

tCO2eq over 10 year

Value Chain Investment Profiles

1

Sorghum Value Chain

Investment: \$50.23M (Government: \$10.45M) | **IRR:** 27% | **NPV:** \$14.67M | **Payback:** 3.85 years

Increase production, processing, and commercialization to achieve 25,000 MT of sorghum flour annually.

Impact: 10,717 beneficiaries | \$981 income increase | 46,867 jobs | ~2M tCO2eq emission reduction

2

Sesame Value Chain

Investment: \$30.66M (Government: \$7.08M) | **IRR:** 37% | **NPV:** \$17.25M | **Payback:** 2.35 years

Increase production, processing, and commercialization to achieve 20,000 MT of dehulled sesame annually.

Impact: 40,978 beneficiaries | \$421 income increase | 166,377 jobs | ~1M tCO2eq emission reduction

3

Fisheries Value Chain

Investment: \$17.09M (Government: \$6.23M) | **IRR:** 20% | **NPV:** \$2.84M | **Payback:** 5.14 years

Increase fish production, processing, and marketing to achieve 1,463 MT annually.

Impact: 1,170 beneficiaries | \$1,773 income increase (highest per capita) | 5,436 jobs | ~1M tCO2eq emission reduction

4

Rice Value Chain (Aweil)

Investment: \$27.69M (Government: \$15.91M) | **IRR:** 15% | **NPV:** \$2.15M | **Payback:** 5.08 years

Increase rice production, processing, and marketing to achieve 6,182 MT annually through Aweil Rice Scheme rehabilitation.

Impact: 4,600 beneficiaries | \$175 income increase | 18,520 jobs | ~1M tCO2eq emission reduction

Sorghum Value Chain in South Sudan

Sorghum is the backbone of South Sudan's food security system, contributing an impressive **76% of the national food supply**. This resilient crop is cultivated by approximately **80% of households across all states**, predominantly using locally adapted seed varieties passed down through generations. Despite its critical importance, the sector faces significant challenges that limit its potential.

591K

MT Production

National output in 2021

700K

Hectares

Total production area

0.84

MT per Hectare

Average yield rate

The productivity figures reveal substantial room for improvement. Current yields of 0.84 MT per hectare fall well below regional benchmarks, while post-harvest losses ranging from **40 to 50 percent** represent a critical inefficiency that undermines food security and farmer incomes.

Import Dependency

Despite being a major producer, South Sudan ranks as the **6th largest importer of sorghum globally**, importing **132,551 MT valued at \$26.3 million** in 2021. Sorghum ranks as the 4th most imported product, with key suppliers including Ethiopia (\$9.42M), Kenya (\$9.33M), the United States (\$5.42M), and Tanzania (\$2.13M).

Risk Assessment and Mitigation Strategies

Successful sorghum value chain development requires comprehensive risk management across climate, financial, and institutional dimensions. Strategic interventions can significantly reduce vulnerability while enhancing productivity and market access.

1

Climate and Environmental Risks

Challenge: Climate change impacts on sorghum yields, affecting access to water, energy, and other critical resources. Inadequate waste management from production and processing activities poses environmental concerns.

Mitigation Measures: Propagate and disseminate improved seed varieties to out-growers through project investments. Provide training on improved agricultural practices and climate-smart techniques. Deploy energy-efficient and renewable energy technologies. Build capacity to meet processing standards and product quality requirements.

2

Financial and Market Risks

Challenge: Price volatility creates uncertainty, with potential reductions in sales prices coupled with increases in input costs threatening farmer profitability and investment returns.

Mitigation Measures: Strengthen producer organizations to improve collective planning, negotiation power, and risk management capabilities. Facilitate access to market information and establish forward contracts where feasible.

3

Institutional and Political Risks

Challenge: Insecurity and potential conflict in target areas threaten project implementation, infrastructure development, and sustained agricultural activities.

Mitigation Measures: Establish co-management arrangements that include local stakeholders supporting surveillance, early warning systems, and conflict resolution mechanisms. Build strong community engagement to enhance project ownership and security.

Sorghum Investment: Financial Performance Analysis

The proposed sorghum value chain investment demonstrates strong financial viability and substantial socioeconomic impact across five priority regions. With a total investment requirement of **\$50.2 million** over the first three years, the project delivers compelling returns while creating significant employment and income opportunities.

Investment Requirements

Initial Asset Investment	\$20.9M
Working Capital	\$29.3M
Total Investment Required	\$50.2M

Key Performance Indicators

Internal Rate of Return	27%
Net Present Value (12%, 10 years)	\$14.7M
Benefit-Cost Ratio	1.19
Payback Period	3.85 years

Economic and Social Impact

10,717

Direct Beneficiaries

Farmer households reached

\$981

Income Increase

Average per beneficiary annually

11,717

Direct Jobs

Employment created

35,150

Indirect Jobs

Additional employment generated



The investment demonstrates robust resilience with a **switching value of -19% for benefits and +16% for costs**, indicating substantial buffer against adverse scenarios.

Sesame Value Chain in South Sudan

Sesame represents a significant export opportunity for South Sudan, primarily cultivated by smallholder farmers with emerging commercial production in Upper Nile State. While the country ranks impressively for cultivation area, productivity challenges limit its competitive position in global markets.

Global Ranking: Area Harvested

5th in the world for sesame cultivation area, demonstrating significant production capacity and favorable growing conditions.

Global Ranking: Yield

64th in the world for yield performance at 0.3 ton per hectare, highlighting substantial opportunities for productivity improvements through value chain interventions.

Production Volume 2021

26,000 MT total national production, representing the foundation for expanded processing and export development.

Export Performance and Market Access

In 2021, South Sudan exported **\$253,000 in sesame oil and fractions** (not chemically modified), ranking as the **44th largest exporter globally**. Sesame products represent the **16th most exported product** from South Sudan, indicating established market connections and growth potential.

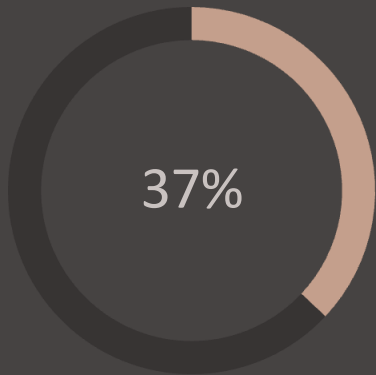
Current export destinations are concentrated in two key markets: the **United Arab Emirates (\$242,000)** and **France (\$11,100)**. This concentration presents both opportunities for deepening existing relationships and risks that underscore the need for market diversification strategies.

Import levels remain negligible, positioning South Sudan as a net exporter with strong potential to expand market share through quality improvements and value addition investments.

Sesame Investment: Financial Performance Analysis

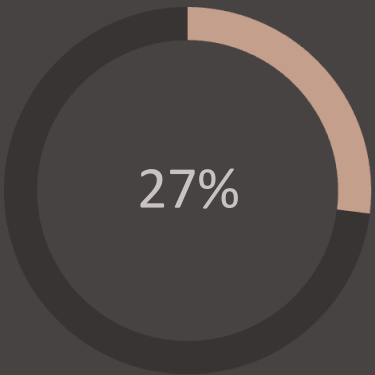


The sesame value chain investment across four priority regions demonstrates exceptional financial returns and transformative socioeconomic impact. With a total investment of **\$30.7 million**, the project achieves the highest internal rate of return among all proposed value chain interventions while reaching the largest number of beneficiaries.



Internal Rate of Return

Highest among all value chain investments



Cost Resilience

Switching value - project remains viable even with 21% cost increase



Benefit Buffer

Can absorb 27% reduction in benefits while remaining viable

Investment Structure

Asset Investment (Years 1-3)	\$14.2M
Working Capital (Years 1-2)	\$16.5M
Total Investment Required	\$30.7M

Financial Indicators

Net Present Value (12%, 10 years)	\$17.2M
Benefit-Cost Ratio	1.27
Payback Period	2.35 years

Socioeconomic Impact

40,978

Direct Beneficiaries

Farmer households

\$399

Annual Income Gain

Average per farmer household

41,594

Direct Employment

Jobs created

124,783

Indirect Employment

Additional jobs generated

The rapid payback period of just 2.35 years, combined with exceptional resilience metrics, makes sesame investment highly attractive for both public and private sector engagement. The project's ability to reach over 40,000 farming households while generating substantial employment multipliers positions it as a cornerstone intervention for inclusive economic growth.

Fisheries Value Chain in South Sudan



South Sudan's fisheries sector represents one of Africa's most underutilized natural resources. With abundant water bodies and remarkable fish populations—including reports of fish "dying of old age" due to underharvesting—the sector presents extraordinary potential for economic development and livelihood improvement.

Untapped Potential Worth \$800M Annually



Processing, Markets, and Value Addition

Currently, approximately **56% of fish catch undergoes processing** in fishing camps and villages through traditional smoking or drying methods. The remaining catch is sold fresh and whole, representing missed opportunities for value addition and extended shelf life.

Post-harvest losses exceed 50% of total catch due to inadequate handling, storage, processing infrastructure, and transportation capabilities. These losses translate to significant economic waste and reduced food security.

Key states with abundant fishery resources include **Upper Nile, Jonglei, Unity, Northern Bahr el Ghazal, Warrap, and Lakes**, offering geographic diversity for investment targeting.

Market Access and Trade Dynamics

Connecting production sites to urban markets remains a critical constraint, severely exacerbated by **inadequate road infrastructure and complete absence of cold chain facilities**. Before the 2013 crisis, South Sudan exported up to 20,000 MT of fish annually to Sudan. While this trade route has diminished due to insecurity and barriers, **dried fish exports to the Democratic Republic of Congo have increased**, demonstrating adaptability and alternative market potential.

Fisheries: Challenges and Opportunities



The fisheries sector's transformation requires addressing systematic constraints while capitalizing on unique competitive advantages. Strategic interventions can unlock substantial value creation and inclusive economic participation.

Critical Challenges

Access Barriers

Limited access to modern fishing gear, quality inputs, technical assistance, finance, and comprehensive value chain services constrains productivity and efficiency improvements.

Seasonal Constraints

Rain seasonality exerts strong influence on both fish catch volumes and transportation logistics, creating predictable but challenging operational cycles.

Quality and Safety Standards

Poor sanitary standards and inadequate traceability systems throughout the value chain limit market access, particularly for premium urban and export markets.

Infrastructure Deficits

Insufficient post-harvest infrastructure combined with limited management capacity drives approximately **65% product losses**, while poor road networks result in prohibitively high transportation costs.

Strategic Opportunities

Inclusive Access

Fisheries are highly accessible to women and youth, providing viable livelihood pathways and employment opportunities for traditionally marginalized groups.

Activity Reliability

Fishing is perceived as a more secure and dependable economic activity compared to crop agriculture, with lower vulnerability to certain conflict dynamics.

Premium Pricing

Investments in cold storage and refrigerated transportation infrastructure unlock access to premium price points in quality-conscious markets.

Strong Market Demand

Robust demand in Juba combined with high export potential to neighboring countries creates clear market pull for production expansion and quality enhancement.

Fisheries Investment: Financial Performance Analysis

The fisheries value chain investment targeting three priority areas along the Nile-Sobat corridor represents a strategic intervention in one of South Sudan's most promising yet underdeveloped sectors. With a total investment requirement of **\$17.1 million**, the project delivers solid financial returns while generating the highest per-beneficiary income increases among all proposed value chain interventions.

Total Investment \$17.1M Asset investment: \$7.8MWorking capital: \$9.3M	Internal Rate of Return 20% Strong returns over 10-year period with 12% discount rate
Net Present Value \$2.8M Positive value creation at 12% discount rate	Payback Period 5.14 years Investment recovery timeline

Exceptional Resilience and Socioeconomic Impact

Project Resilience

The investment demonstrates remarkable robustness with a **benefit switching value of -67%**, meaning the project remains financially viable even if benefits fall by two-thirds. The cost switching value of **+40%** indicates substantial buffer against cost overruns, while the **benefit-cost ratio of 1.67** reflects strong value generation relative to investment requirements.

Transformative Impact Metrics

1,170 Direct Beneficiaries Fisher households reached	\$1,773 Annual Income Increase Average per household—highest across all value chains
1,359 Direct Employment Jobs created in fishing and processing	4,077 Indirect Employment Additional jobs in support services



▣ The **\$1,773 annual income increase per household** represents the highest impact among all proposed value chain investments, demonstrating fisheries' exceptional potential for poverty reduction.

Rice Value Chain in South Sudan

Rice ranks among the four major staple cereals in South Sudan, representing a critical component of the national diet and food security strategy. The crop is cultivated using **two distinct production systems**: upland rice, which relies on rainfall, and lowland/paddy rice, which utilizes natural flooding or irrigation infrastructure.



National Production

In 2021, South Sudan produced approximately **26,000 tonnes of rice**. Production occurs across multiple states with varying agronomic conditions and water access, creating opportunities for system-specific interventions.



Yield Performance

Current yields exhibit significant variation, ranging from **0.4 to 1.6 MT per hectare** depending on production system, management practices, and environmental conditions. This variation indicates substantial potential for productivity enhancement through improved agronomic practices.



Import Dependency

In 2021, the country imported **\$3.93 million in rice**, making it the **62nd most imported product**. This import dependency represents both a food security concern and an opportunity for import substitution through expanded domestic production.

Import Sources and Trade Patterns

South Sudan's rice imports are sourced from five primary origins, reflecting regional trade integration and Asian market connections. **China dominates with \$3.36 million** (85% of total imports), followed by **India at \$356,000, United Arab Emirates at \$113,000, Rwanda at \$80,800, and Kenya at \$16,500**. This concentration in Asian suppliers indicates price competitiveness but also vulnerability to international supply chain disruptions and exchange rate fluctuations.

The substantial import bill presents a clear economic case for domestic production expansion. Strategic investments in irrigation infrastructure, improved seed varieties, mechanization, and processing capacity can reduce import dependency while creating rural employment and strengthening food sovereignty.

Aweil Rice Scheme Investment Case

The Aweil Rice Scheme represents a flagship investment opportunity to dramatically increase rice production, productivity, and commercialization in one of South Sudan's most suitable rice-growing regions. The project targets comprehensive rehabilitation and modernization of 12,000 hectares, directly benefiting **4,440 smallholder farming households**.

Comprehensive Value Chain Transformation



Infrastructure Rehabilitation

Comprehensive rehabilitation of road access, protective dykes, and irrigation canal systems to ensure reliable water delivery and market connectivity throughout production and post-harvest periods.



Mechanization Package

Procurement of tractors and related agricultural equipment to reduce labor constraints, improve timeliness of operations, and expand cultivation area per household.

Capacity Building and Technical Support

Strengthen the research center's capacity while building comprehensive technical skills among farmers, extension workers, and private sector partners. This knowledge transfer ensures sustainable adoption of improved practices beyond project duration.

Facilitate systematic access to critical inputs including fertilizers, improved rice seeds, and agrochemicals through market-based distribution systems that ensure affordability and reliability.



Improved Seeds and Stock

Development and multiplication of improved rice seed varieties suited to local conditions, ensuring sustained access to high-quality planting materials with enhanced yield potential and climate resilience.



Processing Infrastructure

Procurement and installation of small-scale post-harvest processing and value addition equipment for farmer groups, reducing losses and capturing additional value at origin.

Multi-Purpose Solar Infrastructure

Establish additional **multi-purpose solar-powered boreholes** serving dual functions: supporting dry-season horticulture production for crop diversification and income stability, while providing essential access to potable water for household consumption and improved community health outcomes.

Aweil Scheme: Financial Performance



The Aweil Rice Scheme investment requires **\$27.7 million** in total capital over three years, combining infrastructure rehabilitation, equipment procurement, and working capital provisions. Despite representing the largest single-scheme investment among rice interventions, the project delivers positive financial returns while generating substantial employment and food security benefits.

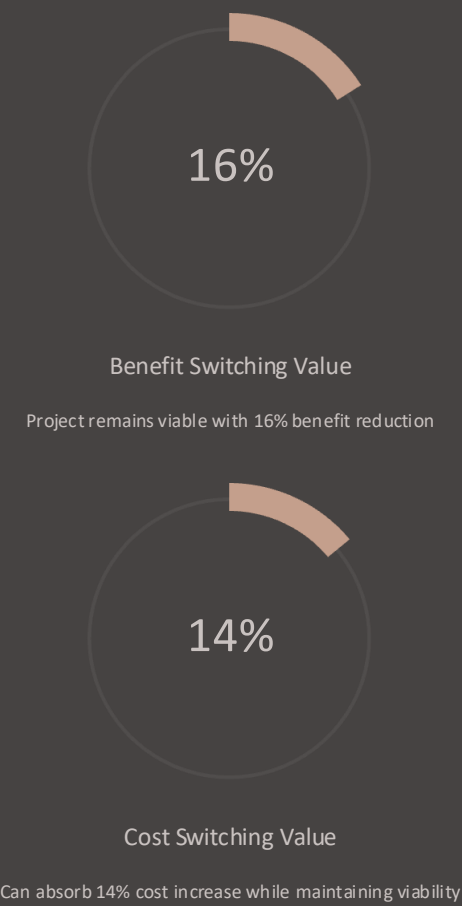
Investment Structure and Returns

Component	Amount (USD)
Asset Investment (Years 1-3)	\$19,884,684
Working Capital (Years 1-2)	\$7,801,851
Total Investment Required	\$27,686,535

Financial Indicator	Value
Internal Rate of Return	15%
Net Present Value (12%, 10 years)	\$2,146,249
Benefit-Cost Ratio	1.16
Payback Period	5.08 years

While the switching values indicate more modest resilience compared to other value chain investments, they still demonstrate reasonable robustness given the infrastructure-intensive nature of the scheme.

Project Resilience Analysis



Socioeconomic Impact and Employment Generation

