



Food and Agriculture Organization of the United Nations



Hand-in-Hand Initiative



Scaling-up Capacity, Partnerships and Investment to Accelerate Agrifood Systems Transformation in the Sahel

Regional initiative for the Sahel

Investment Forum | Rome, Italy | 17-20 October 2023



Section 1: The Sahel Overview

Section 2: Why investing in the Sahel

Addressing multidimensional challenges

Seizing opportunities

Section 3: The enabling environment

Section 4: Investment proposals

Solar powered irrigation pumps

Small Reservoirs irrigation

Market integration and trade



Invest in
The Sahel



Hand-in-Hand
Initiative

The Sahel: *An Overview*



-  Burkina Faso
-  Cameroon
-  Chad
-  Gambia
-  Guinea
-  Mauritania
-  Mali
-  Nigeria
-  Niger
-  Senegal



Source: U.N. Office for the Coordination of Humanitarian Affairs (OCHA)

10 UNISS Countries

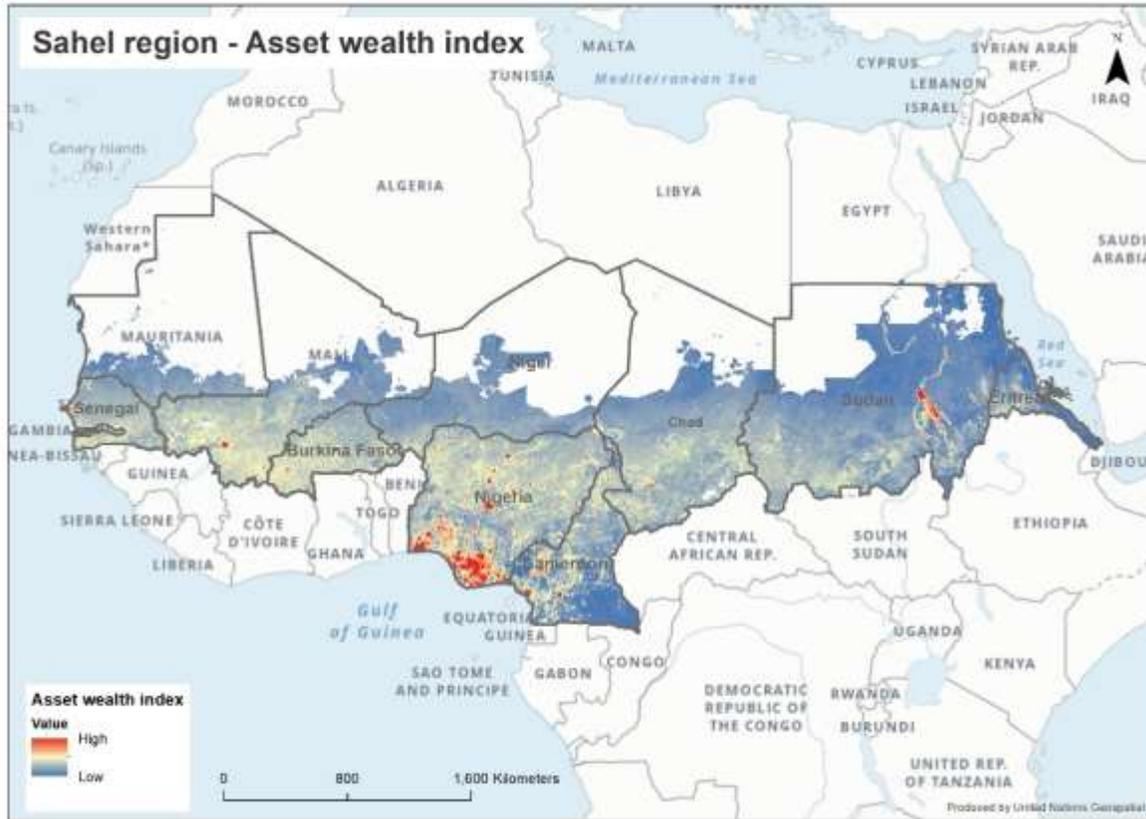
Area ~ 3 Million km²/sq

Rainfall
 ~ 100-200 mm (North)
 ~ 700-1000 mm (South)





The Sahel: *An Overview*



Total population approaches 400 million (211 million Nigeria)

GDP growth rates average around 4% annually similar to rest of the continent.

Economies diversifying into service sectors.

10 Francophone countries account for just compared to 5 Anglophone counterparts (76%) due to Nigeria's economy being massively larger than its neighbors





Agriculture main provider of jobs for many countries

Driving force of the economies contributing on
average 25% to GDP

Farmers are one of the most vulnerable
and poorest group

High cereal production with low productivity

Rain-fed agriculture, subsistence crops
and large unexploited livestock sector

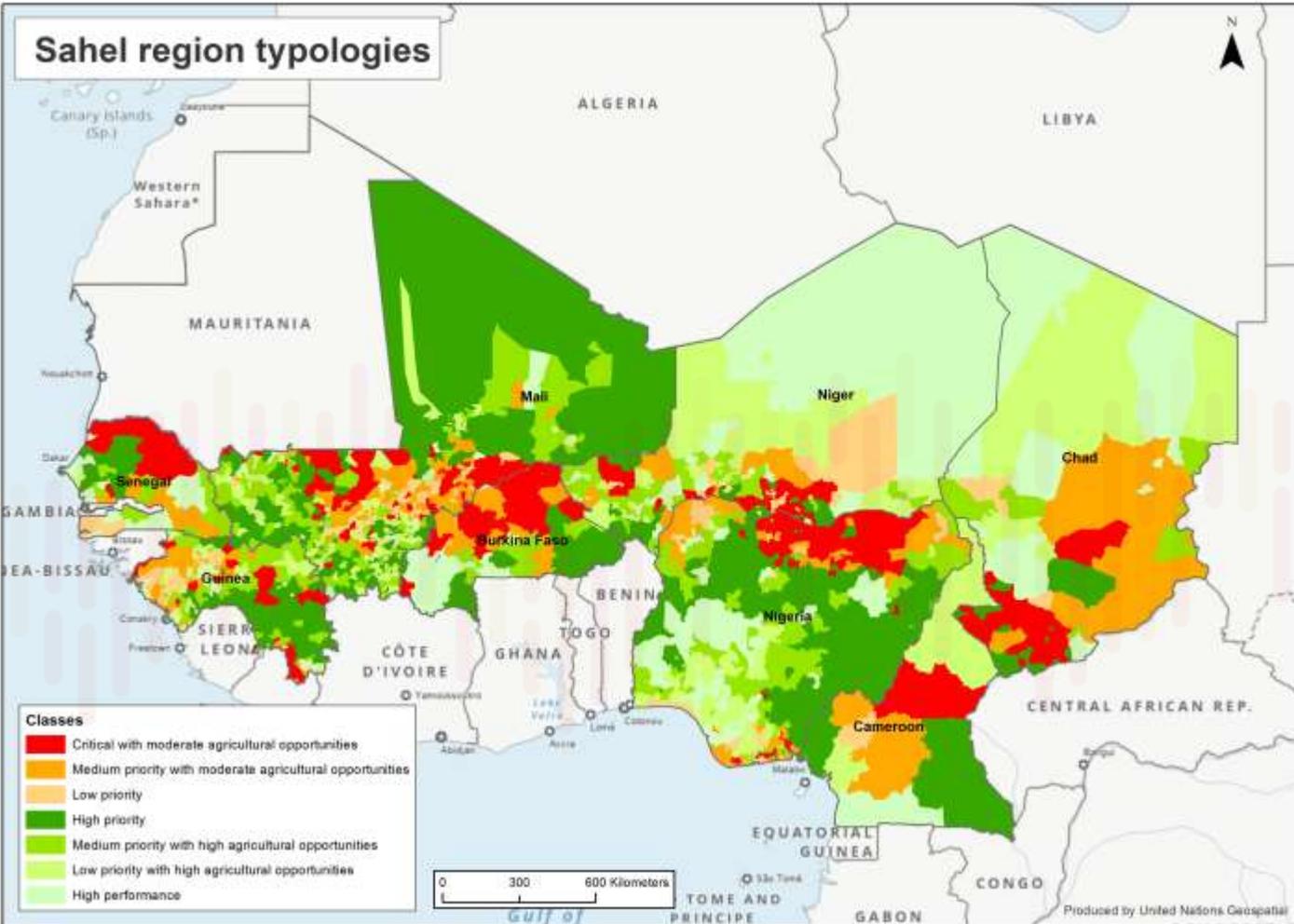
Low value added per worker
(but higher than east Africa)

Despite potential, irrigation is rare

All countries are net importers of food

	Agriculture % of GDP	Arable land %
Burkina Faso	20	21
Cameroon	21	13
Chad	23	4
Gambia	25	38
Guinea	27	13
Mali	36	5
Mauritania	19	1
Niger	40	14
Nigeria	24	37
Senegal	16	17
Average	25	





Map of agricultural typologies of the Sahel: priority areas for investment

	Poverty	Potential	Efficiency
Critical with moderate agricultural opportunities	High	Moderate	Any
Medium priority with moderate agricultural opportunities	Medium	Moderate	Any
Low priority	Moderate	Moderate	Any
High priority	High	Medium / High	Medium / Moderate
Medium priority with high agricultural opportunities	Medium	Medium / High	Medium / Moderate
Low priority with high agricultural opportunities	Moderate	Medium / High	Medium / Moderate
High performance	Moderate	Medium / High	High





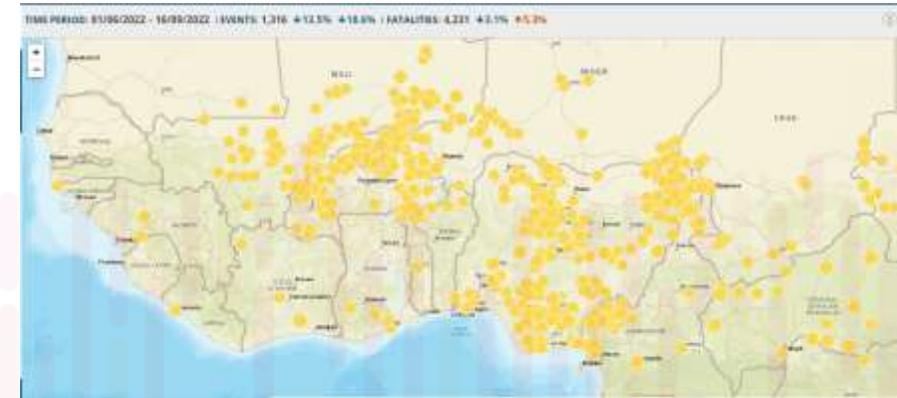
Challenges from climate change

- ✓ Repeated cycles of droughts, desertification and floods
- ✓ Exposed to climate change
- ✓ Yield prospects for key crops uncertain
- ✓ Livestock and pastoralists in risk
- ✓ Increased water scarcity locally

General challenges

- Poverty (ranging between 30 and 50 percent of the population)
- High food insecurity and widespread hunger and malnutrition in some regions
- Political and security challenges
- Population growth pressures / Urbanization
- Agriculture sector challenges (Low productivity and competitiveness, limited access to markets for farmers, little value addition)
- Rural exodus and uncontrolled youth emigration

Social challenges: unrest and conflict



Incidence of conflict in 2022 - Source: ACLED





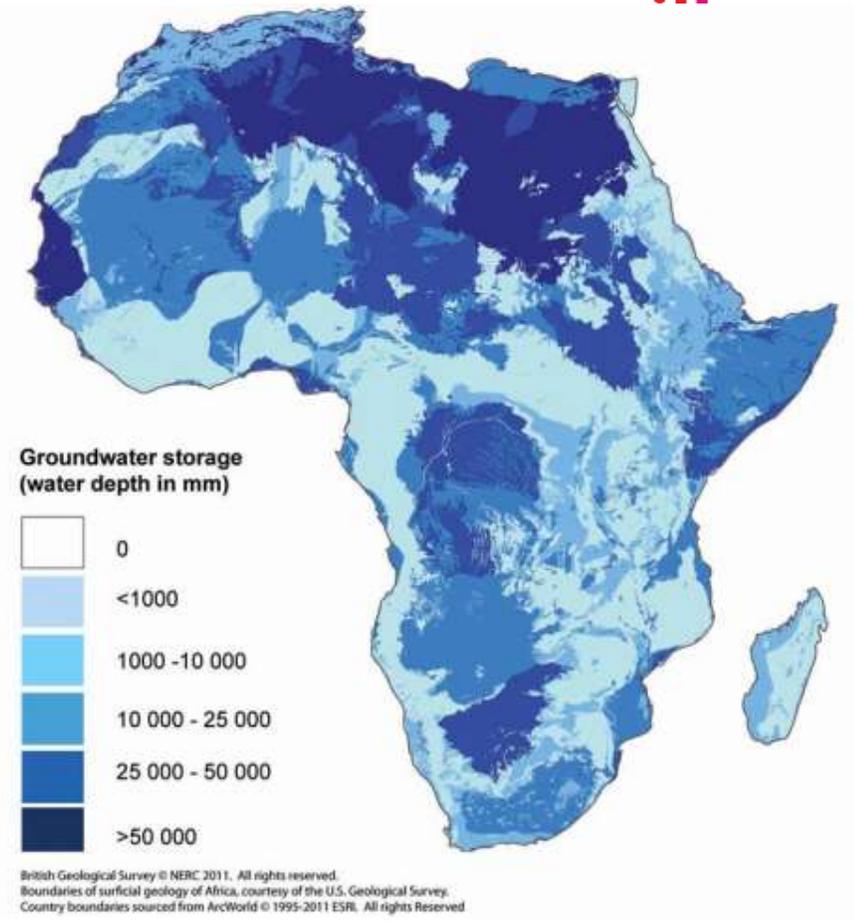
S2 Seizing Opportunities



- Abundant water resources
- Regional Food economy value more than doubled since 2010 and expected to reach \$480 billion by 2030 (OECD)
- Rapidly rising food demand at sub regional and continental levels conducive to grow the currently limited Intraregional trade
- Young population (65% less than 25 years)
- Business opportunities in food production, infrastructure and trade
- ~90% of jobs expected to be created by 2030 in agrifood sector (OECD)
- Enabling environment put in place by countries such as tax incentives for business creation



Water resources the Sahel



Source: MacDonald et al. 2012.

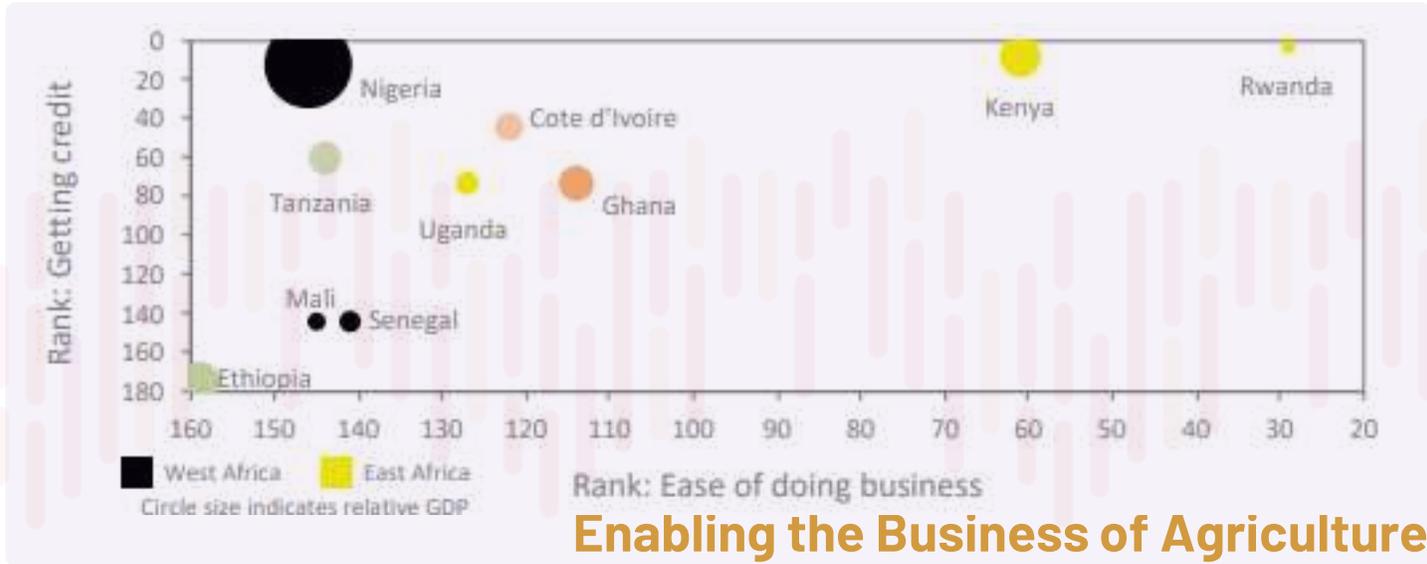
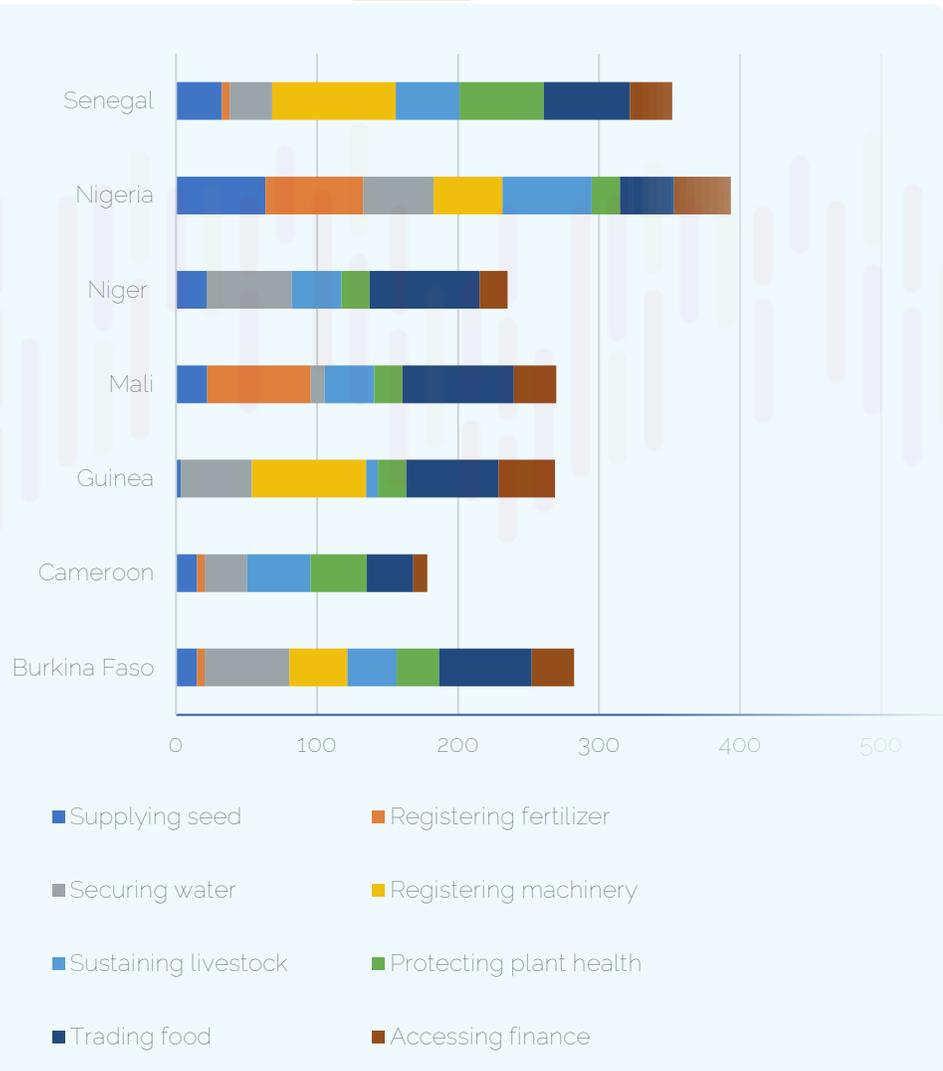




The Sahel Enabling Environment



Enabling the Business of Agriculture



Enabling the Business of Agriculture



Enabling the Business of Agriculture





Enabling Environment *by Country*



Burkina Faso

Existence of sub-regional demand for animal products

Easily accessible market of more than 120 million consumers

Tax incentives for business creation (exemption over a long period and reduction of customs tariffs on certain capital goods); development of agricultural insurance

Cameroon

Rural Sector Development Strategy & National Agricultural Investment Program to increase jobs in rural sector by 2030

Agriculture oriented towards commercialization to national and international markets

Government to strengthen partnership with private sector, to achieve economic growth

Chad

National Pact for Food and Agriculture to contribute to the elimination of extreme poverty, hunger and malnutrition

African Continental Free Trade Area as an opportunity to mobilize foreign direct investment for productivity and technological advances.

The Gambia

Government to improve investment in the sector to achieve Maputo objectives.

~3% of arable land is under irrigation despite significant resources

Implementation of a model of public-private partnership to build / develop irrigation infrastructure.

National Development Plan 2018-21 prioritizing and enabling the private sector role

Mali

Development of Special Economic Zones for Agriculture (Agropoles)

Structuring infrastructure (installment, energy, basic social services)

Important and diversified animal resources

Strategic political frameworks such as the Investment Promotion Agency





Nigeria

Zero percent duty tariffs for import of agricultural equipment and agro-processing equipment.

Exemption of interest from tax on loans granted to agricultural activities

Income tax relief for a period of three years (extendable to two more)

Pioneer Status Incentives

Niger

Livestock > 37 million heads

Establishment of 8 agropoles based on public-private local community partnerships.

Infrastructure investments, strengthening of the national agricultural financing system, and subsidies for business plans of private operators.

Mauritania

Agency for the Promotion of Investments in Mauritania working to strengthen the development of private investment

Framework relating to PPP for the development of the infrastructure and necessary public services

Legal framework for business (one-stop shop), offering guarantees to investors, simplifying formalities and legal procedures for setting up companies (<48 hours) at low cost

Senegal

VAT reduction in production factors and products intended for the management of acute malnutrition

Tax exemptions for supplies of agroecological production systems and organic farming with renewable energy

Tax exemptions / reductions for integration projects for young people in the tertiary sector in rural areas

Guinea

High demand commodity value chains

Tax policy favorable to investment (exemption from customs for inputs and production equipment)

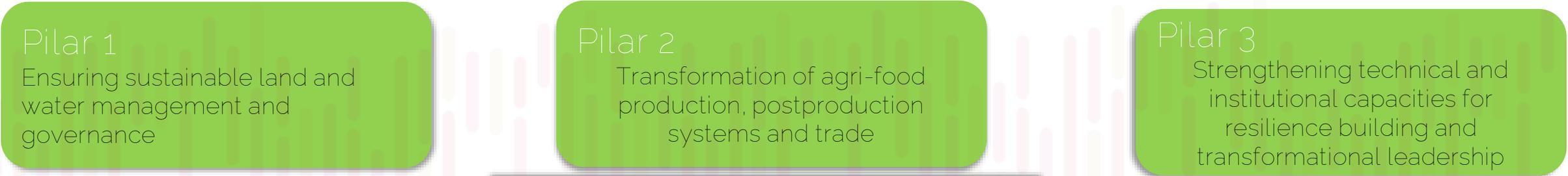
Low labor and transportation costs

Agro-climatic condition favorable to agriculture and livestock (11 agropoles)





HiH Sahel Initiative Pillars and Priorities as agreed at the 1st HiH IF in 2022



HiH Sahel a multi-partner program complementing ongoing efforts



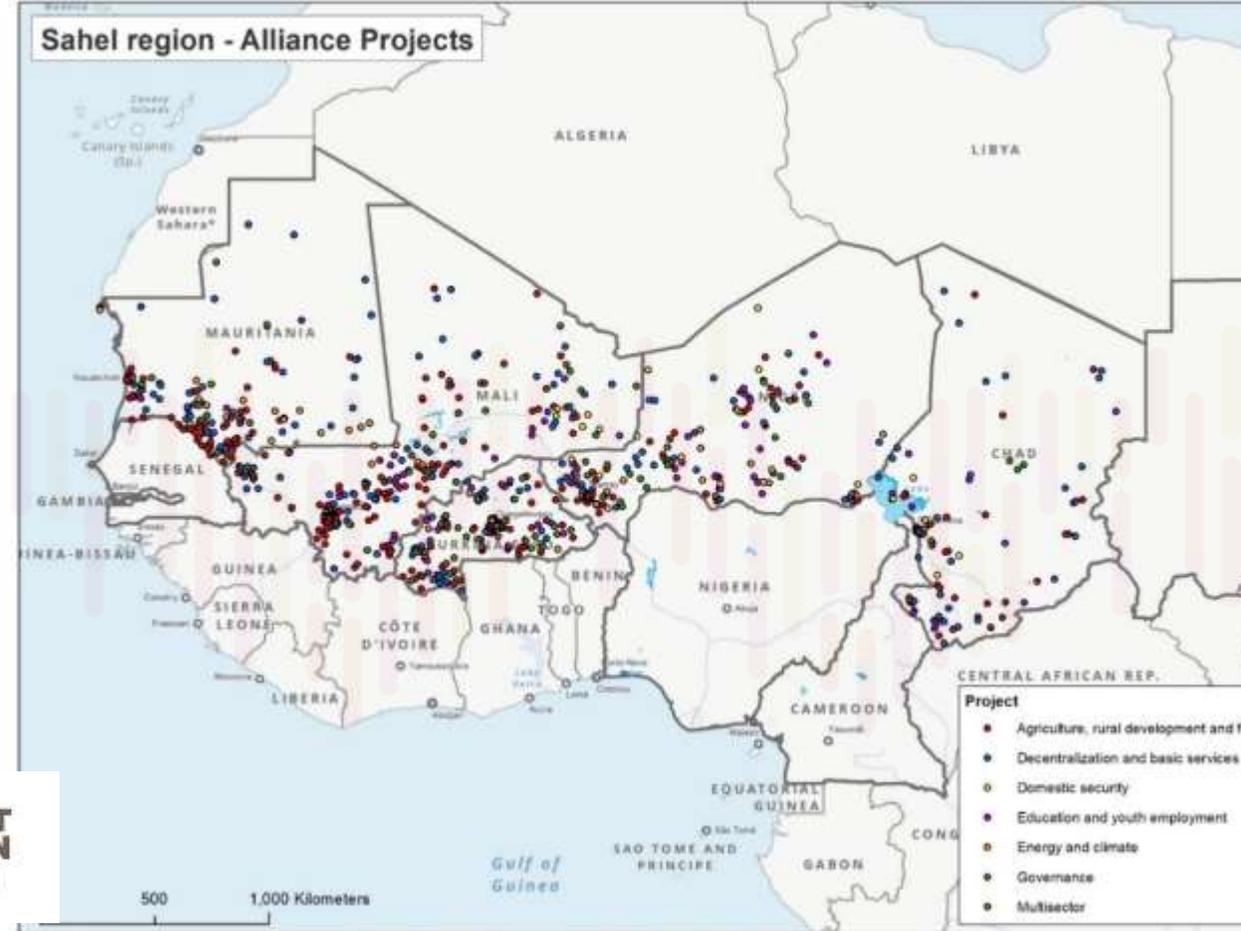
National governments and.....



Food and Agriculture Organization of the United Nations



GREEN CLIMATE FUND



.....and many others including private sector



Mapping of Major initiatives and Leading Partners/Institutions



Major initiatives and Leading Partners/ Institutions	Budget and major financier	Major Investment and relevance to HiH Sahel pillars		
		Pillar 1	Pillar 2	Pillar 3
Initiative pour l'Irrigation au Sahel (zis) : « Projet d'Appui Régional à l'Initiative pour l'Irrigation au Sahel » (PARIIS / SIIP) – 2018-2024 (link here) CILSS + 6 countries	170 million USD, World Bank Group, Governments, Beneficiaries	Cross cutting – with emphasis on irrigation investment solutions (Pillar 1) in 5 types of irrigation systems		
Opération Fluidité Routière Agro-Bétail (OFR) « Agro-Livestock Road Fluidity Operation (RFO)» (CILSS + WACTAF)	IFAD - FARM-TRAC project (family farming, regional markets and cross-border trade corridors in the Sahel) + USAID		Focusing on Pillar 2 on markets, aiming to reduce illicit payments by 30 to 90% and transport time by 20 to 50% on the main road corridors	
The West Africa Food System Resilience Programme (FSRP) (link here)	Phase1: 330 million USD Phase 2: 315 million USD Total 645 million USD – major financier World Bank Group		Investment project related to Pillar 2 and Pillar 3 (focusing on the regional food market integration and the development of strategic regional value chains)	
Climate Finance projects in the Sahel countries: GEF, GCF, LDCF	864.7 million USD (34.4 % delivery) GEF, GCF, LDCF, WB, AfDB, BOAD,...) OPEC, Govts..	Cross cutting investment projects Resilience of Agriculture to Climate Change to: at least 20% of the total project portfolio		
Projects designed and implemented with the support of FAO Investment Centre from January 2020 to August 2023.	About 3,700 million USD (major financiers: World Bank Group, IFAD)	This includes several regional projects (PARIIS, GAFSP, PROLAC..) and country-level projects that are relevant for the HiH Sahel, addressing main challenges in the HiH Sahel's three Pillars		





Regional initiative to complement country initiatives



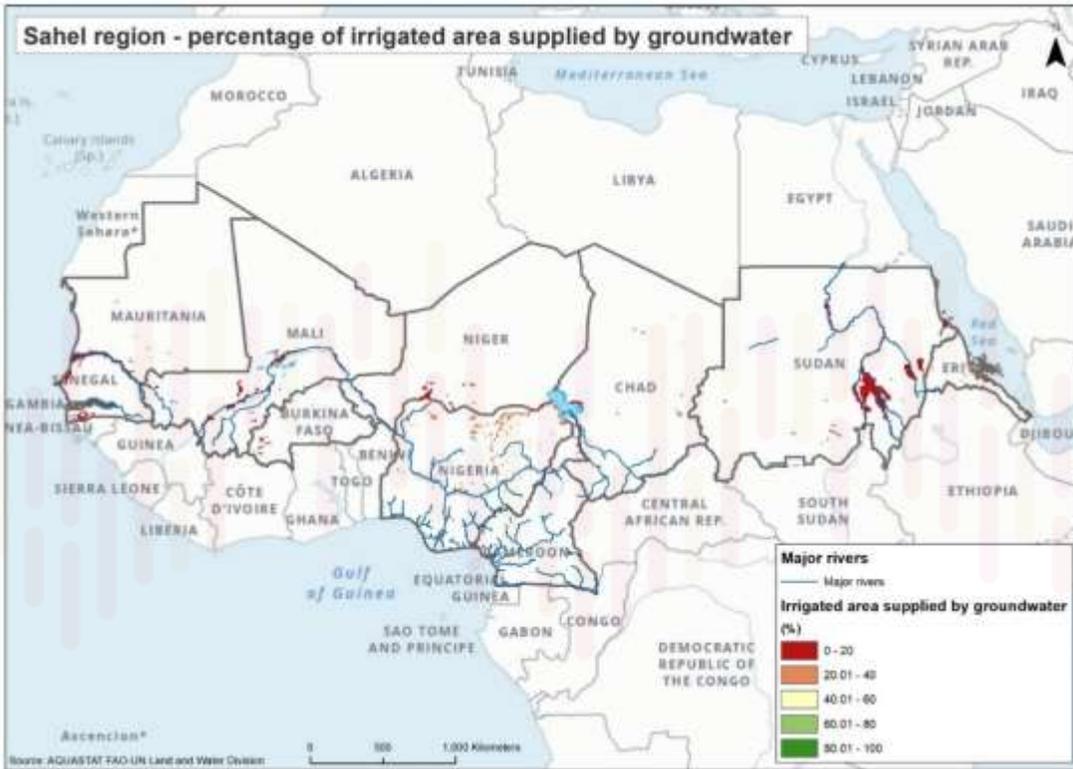
Burkina Faso, Cameroon, Chad, Gambia, Guinea, Niger, Mali, Nigeria, Senegal

	Approach	Target regions	Value chains
Burkina Faso	Arrimage PNIASP-HiH	Centre-Est, Centre-Ouest, Est et Sud-Ouest	Rice, Corn, Peanut, Cowpea, Sesame, Bovine, Ovine, Porcine, Goat
Cameroon			Rice, Rice-fish mix farming system
Guinea	National Agriculture Investment and Food Security Plan	Yomou, Siguiri, Lola, Dinguiraye, Mandiana, Tougue, Koubia, Koundara, Dabola, N'Zérékoré, Macenta, Youmou	Rice, Maize, Small ruminants, Pigs
Guinea Bissau	Twin-track approach (national strategy for value chain & diversification of food systems)	Gabu, Oio and Biombo	Cashew, fishery, local agriculture, forestry, fishing small livestock
Mali	Support the implementation of two pilot Agricultural Growth Zones	Koulikoro and Kayes	Polyculture market gardening; livestock and meat sector
Niger	Agriculture value chain development Digital Villages Initiative (pilot)	Tahoua and Dosso	Onion and dairy
Nigeria	Twin-track approach (i) resilience building for emergency; and (ii) priority VCD Digital Villages Initiative (pilot)	Katsina, Borno, Zamfara, Sokoto, Yobe, Kano, Ogun, Kwara, Osun, Oyo	Rice, Sorghum, Soybean, Maize, Fish, Tomatoes, Cassava, Dairy
Senegal	Digital Villages Initiative/ Compacts Dakar II/ Agropoles	Niaye, Senegal river, Anambe...	Fruits and vegetables, grains
Ghana, Liberia	Digital Villages Initiative (pilot)	tbd	tbd





Investment proposals on Irrigation in the Sahel



	Agricultural land (1,000 ha)	Area equipped for irrigation (1,000 ha)	Proportion of area equipped for irrigation
Burkina Faso	12,143	55	0.5%
Cameroon	9,750	29	0.3%
Chad	50,238	30	0.1%
Gambia	605	5	0.8%
Guinea	14,500	95	0.7%
Mali	41,201	380	0.9%
Mauritania	39,661	45	0.1%
Niger	46,597	267	0.6%
Nigeria	69,450	331	0.5%
Senegal	8,878	120	1.4%

Small proportion of land equipped with irrigation



Irrigation in the Sahel – Solar powered irrigation pumps



Gambia 20 ha
Investment \$0.2 million
NPV 0.15 million
Beneficiaries 40
Co2e 8 MT

Mauritania 14,400 ha
Investment \$123 million
NPV \$109 million
Beneficiaries 28,800
Co2e 6,048 MT

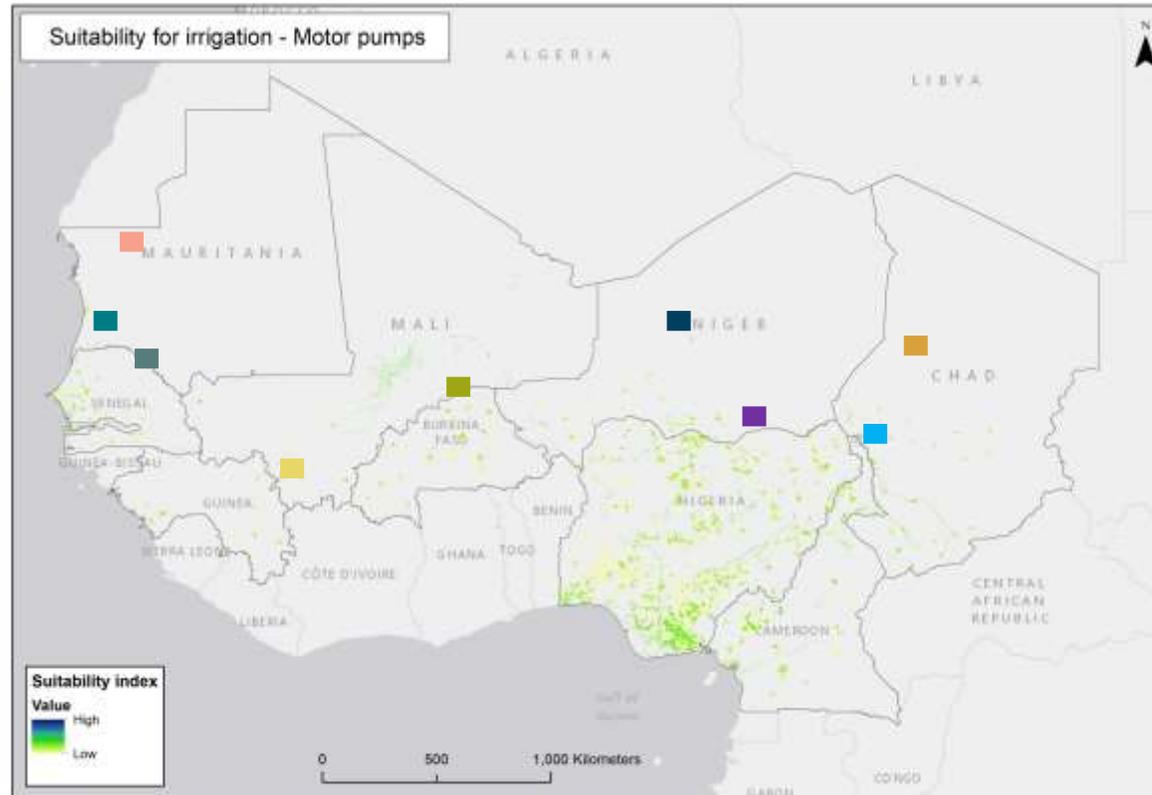
Niger 4,200 ha
Investment \$36 million
NPV \$32 million
Beneficiaries 8,400
Co2e 10,878 MT

Mali 3,000 ha
Investment \$26 million
NPV \$23 million
Beneficiaries 6,000
Co2e 480 MT

Guinea 1,500 ha
Investment \$13 million
NPV \$11 million
Beneficiaries 3,000
Co2e 450 MT

Burkina Faso 9,000 ha
Investment \$77 million
NPV \$68 million
Beneficiaries 18,000
Co2e 4,590 MT

Cameroon 3,000 ha
Investment \$26 million
NPV \$23 million
Beneficiaries 6,000
Co2e 1,650 MT



Sources: Slope (SRTM), Rainfall data (GRDC), Population (WorldPop2020), Access to markets (Nature 553, 333–336), AWC (FAO), Water bodies (WWF)

Potential for shallow groundwater-based irrigation: 1 million hectares

Solar-based surface pump solutions contribute to the scale-up of groundwater-based irrigation

Provision/ procurement from China/India with the possibility of assembly in Africa to reduce the cost of sale to producers.

Senegal 30,600 ha
Investment \$261 million
NPV \$232 million
Beneficiaries 61,200
Co2e 11,016 MT

Chad 18,000 ha
Investment \$153 million
NPV \$137 million
Beneficiaries 36,000
Co2e 18,000 MT

Nigeria 200,400 ha
Investment \$1.7 billion
NPV \$1.5 billion
Beneficiaries 400,800
Co2e 56,112 MT

Irrigation in the Sahel – Solar powered irrigation pumps



Total hectares targeted: 284,100

Capital Investment required :
2.4 billion USD, over three phases
(Year1, Year3 and Year5).

NPV: 1.7 billion USD

IRR (20-year): 21%

Phase 1 (year 1):

- IRR 21%
- NPV 719 million USD
- Total investment 806.901 million USD

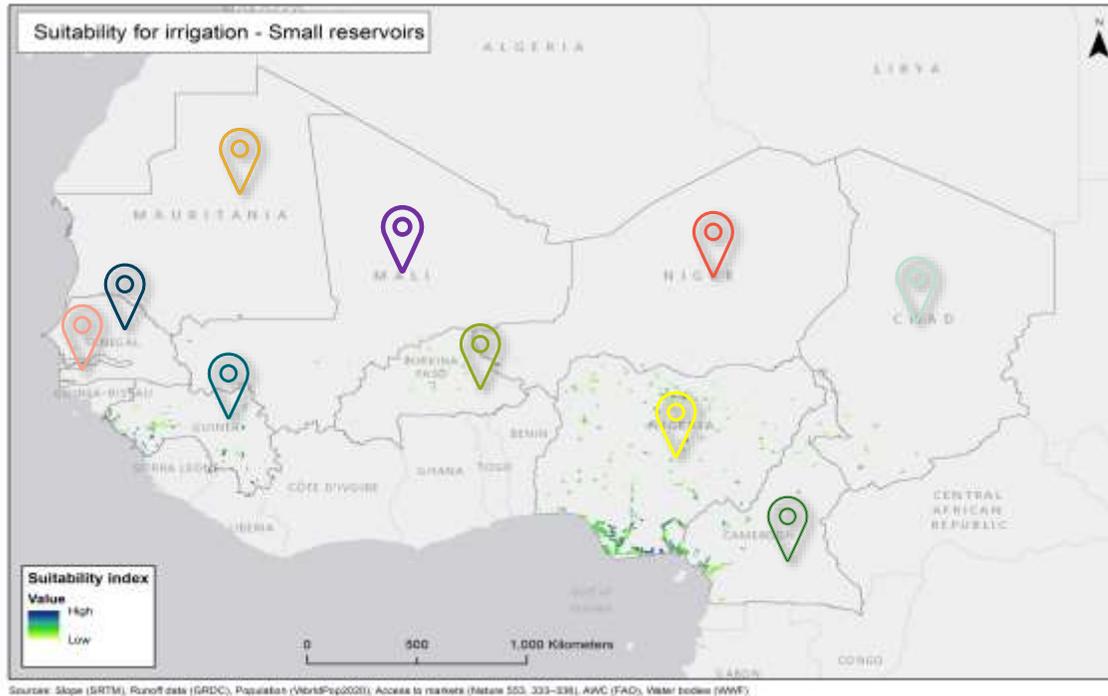
20-year life cycle of solar panels and 4-year life cycle of pumps with a progressive adoption rate

Net incremental benefits (USD billion)



Accounting for climate change: reduction in successful campaigns every 5 years

Irrigation in the Sahel *Small reservoirs*



Burkina Faso 19,067 ha
Investment: \$57 million
NPV \$38.5 million
IRR 27%
Beneficiaries 76,278

Guinea 2,400 ha
Investment \$7 million
NPV \$5.6 million
IRR 30%
Beneficiaries 9,600

Senegal 1,867 ha
Investment \$6 million
NPV \$4.6 million
IRR 31%
Beneficiaries 7,468

Mauritania 200 ha
Investment \$0.6 million
NPV \$0.43 million
IRR 28%
Beneficiaries 800

Nigeria 159,833 ha
Investment \$479 million
NPV \$168.8 million
IRR 19%
Beneficiaries 639,332

Chad 8,500 ha
Investment \$26 million
NPV \$9.2 million
IRR 19%
Beneficiaries 34,000

Niger 3,267 ha
Investment \$10 million
NPV \$8.1 million
IRR 31%
Beneficiaries 13,068

Gambia 133 ha
Investment \$0.4 million
NPV \$0.13 million
IRR 19%
Beneficiaries 532

Mali 14,933 ha
Investment \$45 million
NPV \$-24.8 million
IRR
Beneficiaries 59,732

Cameroon 212,267 ha
Investment \$64 million
NPV \$-19.5 million
IRR
Beneficiaries 85,068

HIH will target 10% of the potential expansion of surface water for irrigation through small reservoirs in Sahel countries estimated to 2.3 million ha equivalent to additional 231,500 ha.

The investment costs for small scale reservoir are comprised between 3,000 and 4,500 USD per ha
Investment: 694 million USD phased over 4 years

IRR: 17%

NPV: 191 million USD

At farm level, the investment shows positive results in all countries, with 60 % public contribution (80% for Cameroon and Mali, requiring higher concessionality).

Market Integration and trade



Potential:

Market integration and trade is an engine of growth, development and food security
Regional trade has potential in stabilizing domestic food markets

Challenges:

Limited diversification outside region / high levels of informal trade
Distortionary trade policies, non trade barriers, weak transport and communications infrastructure, inefficient customs procedures
Limited market infrastructure and non-market facilities

High import and export tariffs

Region/ Country	Average duty on imports	Average duty on exports
Africa	18.4	8.6
ECOWAS	14.2	5.6
Burkina Faso	14.2	3.7
Gambia	16.4	5.1
Guinea	13.8	9.5
Mali	14.2	4.2
Niger	14.2	9.9
Nigeria	13.9	7.8
Senegal	14.8	8.3

Source: IFPRI, 2021

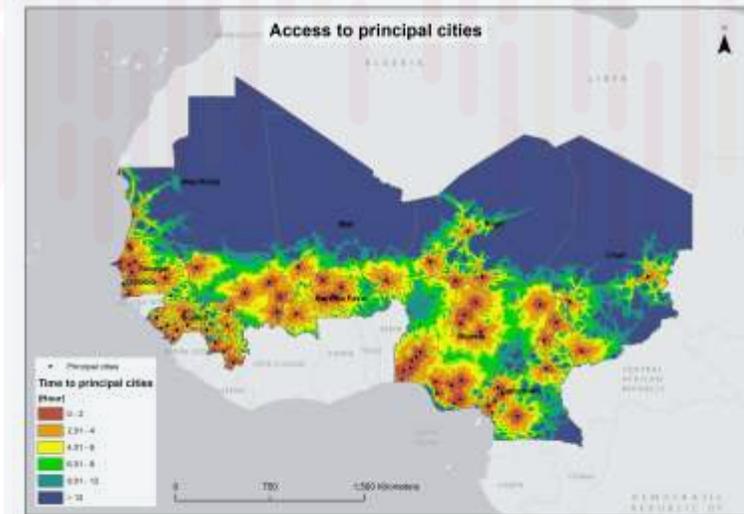
Non-tariff measures

Country	prevalence score	frequency index (%)
Burkina Faso	3.2	99.3
Cameroon	3.1	84.6
Gambia	11.2	90.4
Mali	5.5	100
Mauritania	3.9	89.8
Niger	3.1	94.8
Nigeria	8.8	100
Senegal	2.5	76.5

Source: Bouet, Bao et Traore (2020)

Transportation infrastructure

Time to export: Border compliance (hours)*	Time to import: Border compliance (hours)
91	132



*Source: WB, Ease of doing business, 2019





1 High import and export tariffs

2 Non-tariff measures

3 Transportation infrastructure

Sole removal of tariffs can increase intra-African trade of food and agricultural products 20-30%

Reduction of 50% on import and export tariffs in the agricultural sector, in three phases, represents a decrease in tariff collection for all Sahel countries

Cost per phase: ~389 million USD

Total cost: ~1.2 billion USD

Measures to harmonize NTMs: removing NTBs and increasing the regulatory overlap of technical measures (harmonization, convergence, and mutual recognition).

Support the current functioning reporting mechanism for private sector to raise problems and to detect NTBs: tradebarriers.org

Costs incurred from reducing NTB's in 50% in three phases:

Cost per phase; 295 million USD

Total cost: ~858 million USD

Rehabilitation of corridors from fair to good: Trans-African Highway 1, 5 and 7 from the Trans-African Highway network routes.

Total investment to build missing roads and rehabilitate current roads (3,706 kms): ~894 million USD

Implementation in 3 phases with a cost per phase of 298 million USD



Estimated benefits of *Market integration* and trade in the Sahel



Country	"Investments" by country for 1 phase in million \$US	"Investments" by country for 3 phases in million \$US	Estimated returns IRR (%)
Burkina Faso	30	89	67
Cameron	44	131	76
Chad	1	4	
Gambia	16	47	2
Guinea	74	223	22
Mali	120	361	12
Mauritania	48	144	11
Niger	111	332	20
Nigeria	417	1,251	61
Senegal	122	365	19
Total	982	2,947	

Additional impacts / benefits:

50% reduction in transport costs and non-tariffs barriers can increase the region's GDP by 0.6% (FAO 2022)

Extreme poverty reduction in West Africa attributable to AFCFTA: 12 million people (WB, 2020)

Reductions in poverty in Nigeria 7 million and Niger 5.4 million

Removing NTBs can increase wages between 0.1-1.6% (UNCTAD, 2018)

Net Benefit Phase 1: \$ 419 million USD per year

Net Benefit all phases: \$ 1.3 billion USD per year



Market integration and trade

Additional investment necessary to create market and non-market infrastructure:

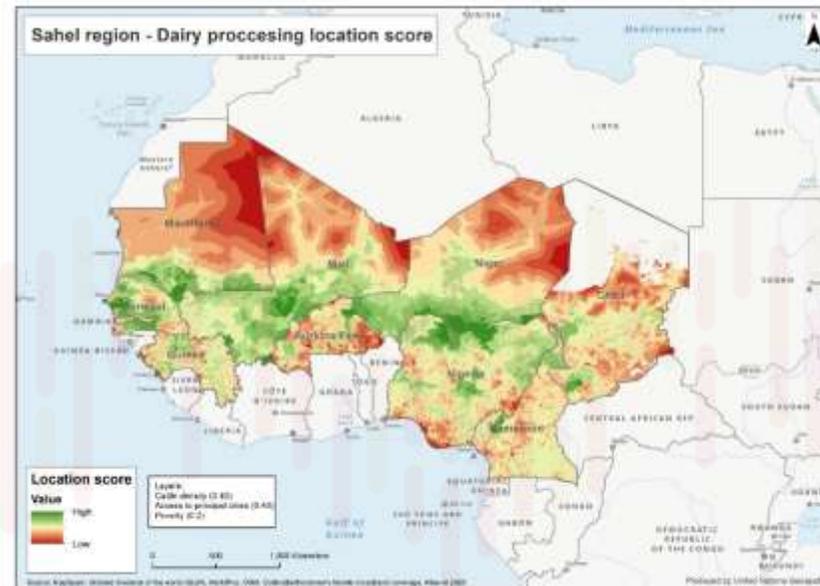
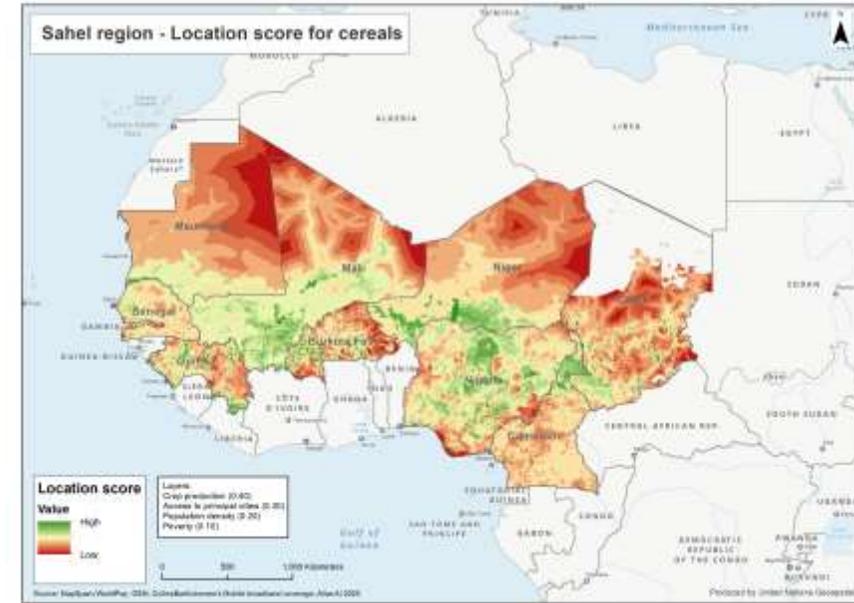
Development of agro enterprises, including MSME, such as agro-processing units, slaughterhouses, Cold storage facilities, collection centers for crops and dairy products

Supporting Agropoles (feasibility studies)

Supporting services (e.g. energy, water infrastructure, veterinary centers, telecommunications)

Related investment needs to be estimated!

Candidate locations for markets and supporting facilities



SUMMARY SAHEL INVESTMENT PLAN



6 Billion USD 2.48 Billion USD Phase1 Total Investment	Overall Average IRR 23%	148.1 Million Direct Beneficiaries	6.73 Million Indirect Beneficiaries	113,861 MT Co2e Emissions
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1

Intervention
Implementing irrigation schemes:
Solar powered irrigation pumps

Cost (USD)
US\$ 2.4 Billion
US\$ 806.901 million for Phase 1

IRR (%) : 21%
NPV : US\$ 1.7 Billion
US\$ 719 million for Phase 1

Sustainability Benefits
Direct beneficiaries: 189,413
Indirect beneficiaries: 1.13 M- Ph1
Direct beneficiaries: 568,240
Indirect beneficiaries: 3.4 million
Income increase per capita:
US\$632
Co2 Emissions: 109,232 MT

2

Intervention
Implementing irrigation schemes:
Small reservoirs

Cost (USD)
US\$ 694 Million

IRR (%)
17%

NPV
US\$ 191 Million

Sustainability Benefits
Direct beneficiaries: 925,868
Indirect beneficiaries: 5.6 million
Income increase per capita:
US\$233
Co2 Emissions: 4,629 MT

3

Intervention
Market and trade integration

Cost (USD)
US\$ 2.9 billion
US\$ 982 million for Phase 1

IRR (%)
32%

Net Benefit
US\$ 1.3 billion
US\$ 419 million for Phase 1

Sustainability Benefits
Direct beneficiaries: 48.9 million
(phase 1)
Beneficiaries: 147 million (full)
Income increase per capita:
0.6%