Accelerating Rwanda's Food Systems Transformation

Diagnostic and Landscaping Analysis by the Food System Transformative Integrated Policy (FS-TIP) Initiative

AUGUST 2021
Goal: Sustainable healthy diets for all

A future state in which every human being has consistent access to a nutritious, high-quality diet that promotes human and planetary health, supports child development, prevents disease, and conserves biosphere resources.

FS-TIP supports governments in Africa that demonstrate robust integrative leadership and capacity in the development and implementation of an ambitious policy agenda aimed at achieving sustainable, healthy diets for all their citizens.

Support by FS-TIP includes building a fact base foundation that is user-centric in its design, developing a tailored food system transformation strategy, and providing implementation support.

FS-TIP works with stakeholders to develop policies that are transformative, resulting in a step change in food systems performance, and integrated, factoring in the dependencies and trade-offs across food systems.

FS-TIP has a long-term, inter-generational perspective, building on momentum of the Food Systems Summit, but has its focus beyond, building a durable platform for transformation, policy development, capacity building, innovation and investment in support of the SDGs.
Rwanda | Diagnostic and Landscaping Analysis
Executive Summary

Approach and key insights from Diagnostic and Landscaping Analysis
Detailed Diagnostic Analysis
Detailed Policy and Stakeholder Landscaping
Next Steps: from Diagnostic to Action
Appendix
Executive Summary | Rwanda's Food System (I/III)

There are substantial opportunities to advance Rwanda’s food system in terms of provision of sustainable and healthy diets for all while also strengthening livelihoods. These efforts would build on Rwanda’s global and regional commitments, utilize a multi-sectoral stakeholder approach and engage with the development community for support.

- Rwanda has demonstrated **strong commitment** to its agricultural transformation targets. The country has been recognized globally for its progress towards meeting the targets outlined in CAADP/Malabo goals and for its alignment with the Sustainable Development Goals.
- Rwanda has held extensive **Food System Summit Dialogues** led by a multi-sectoral Steering Committee which has engaged diverse stakeholders including government ministries, UN agencies, development partners, CSOs, private sector players, women and youth to help identify Rwanda’s main food system challenges and potential pathways to address them.
- The **leadership vision** for a more productive, responsive, resilient food system that meets the needs of Rwandans and the **momentum around the UN Food Systems Summit (FSS)** have pointed towards collaborative opportunities in the Food System and highlighted the need for systems-based approaches.
- Stakeholders are increasingly calling for **post-summit planning**, implementation acceleration, monitoring of food systems’ policies and related outcomes.

Rwanda’s Food Systems, which are a hybrid of rural/traditional and informal/expanding archetypes, play a critical role in the national economy. They also face various challenges. The diagnostic analysis (FS-TIP Research, Food Systems Summit Dialogues and stakeholder engagements) shows:

- In 2020, agriculture contributed 26% to GDP and engaged 67% of the active workforce. Between 2001 and 2011, the agricultural sector was estimated to account for a third of overall poverty reduction. However, **food supply chains do not yet meet the population’s needs for a healthy diet**, due to:
  - **Insufficient production and low crop yields** (crop production remains at ~45% of potential yield) due to small land-holdings, limited use of agricultural inputs and mechanization as well as constrained access to finance.
  - **Limited diversity in production** with a focus on priority, staple crops (e.g., maize, potatoes) and cash-crops (e.g., coffee, tea), resulting in low production, affordability and availability of nutrient-rich foods (e.g., vegetables, fruits).
  - **Under-developed supply chains** with limited private sector investment, leading to accessibility issues and low value addition.
  - **Poor infrastructure for transportation, storage, and distribution** leading to high food losses (9.7% vegetables, 11% fruits, 6.9% cereal).
  - Infrastructure development beyond the farmgate has been limited, making it harder to consistently supply produce to markets and consumers at affordable prices and with minimal food loss.
- Rwanda’s food environment and consumer behavior have shaped the country’s unique consumption patterns:
  - **Highest bean consumption in the world (~29kg/person/year)**. Beans and sweet potatoes make the largest contribution to calories consumed.
  - **Limited presence of street-food vendors and informal eateries**, partly attributable to a culture of “not eating in public” which is seen as impolite.

1. Food Systems Dashboard: “In rural and traditional food systems, farming is mainly done by smallholders, and agricultural yields are typically low. Supply chains are short due to smaller urban populations. Food is mainly sold in informal market outlets. In informal and expanding food systems, agricultural productivity is higher on average than in rural and traditional food systems. The use of inputs (e.g., seeds and fertilizer) is greater. Medium and some large-scale farms are beginning to emerge.” 2. MAMO Panel Report 2021 3. FAO Food Balance Sheets, 2018 4. FAO Food Balance Sheets, 2017 5. CGIAR, 2014
Executive Summary | Rwanda's Food System (II/III)

- **External drivers** slow the development of the food system. Rwanda is highly vulnerable to the effects of climate change and natural disasters (land-slides, floods, droughts) as ~70% of land nationally is on hillsides with limited terracing and low levels of irrigation (~1.6% agricultural operators have invested in irrigation)

- **Challenges in the food system result in poor nutritional, livelihood and environmental outcomes**
  - High levels of undernourishment, leading to negative health outcomes such as stunting (33% of children under-five), driven by challenges in the food systems such as limited availability, access and affordability of nutritious foods. While the rates of wasting and stunting among children under-five has steadily decreased since the early 2000s, undernourishment in the general population has risen from 22.2% in 2012 to 35.6% in 2020
  - Limited income and income growth for a large share of the population that depends on agriculture for their livelihoods (67% of the active workforce). Part of this population depends on social protection programs from the government to survive and few can make their way out of poverty

Rwanda has developed many strategies and policies (e.g., NST1, PSTA, National Environment and Climate Change Policy). The country has also committed to Global and Regional declarations, which cover many of the food system components, however some gaps remain:

- The informal food system, the role of consumer demand and behavior, as well as the role of science & technology are under-represented in policies
- Malabo Declaration and related CAADP indicators also show gaps in processing, infrastructure and health outcomes such as obesity and non-communicable diseases (NCDs)
- At the national level, the main gaps include policies on food production, retail, marketing and distribution as well as affordability of diverse and nutrient rich foods

Existing policies are not always designed in an integrated manner resulting in conflicting objectives and/or approaches with other policies e.g.:

- **Production intensification vs. nutritional needs of the population**: Efforts have been made to improve agricultural productivity to increase food availability nationally (e.g., Crop Intensification Program). However, without a robust trade system to supplement production, this focus on productivity can also contribute to lower crop diversity and availability of nutrient rich foods, an outcome that is not in line with efforts to improve dietary diversity
- **Improving production levels with inputs vs. utilizing environmentally sustainable production methods**: While policies of MINAGRI have focused on increasing agriculture production (PSTA 4) to meet the needs of the population, e.g., through increased use of agricultural inputs such as fertilizer, the Ministry of Environment is trying to limit the harmful impacts of farming on the environment

Executive Summary | Rwanda's Food System (III/III)

In addition to designing policies in a more integrated way, a focus on implementation is key to ensure progress is monitored and results are achieved

- Policies are not always geography-specific at the sub-national level, while targeted interventions are required to address some of the more stubborn problems such as household food insecurity, stunting in food-basket provinces and biodiversity loss
- Performance-based contracts (imihigos) sometimes have divergent incentives (e.g., emphases on high performance, risk-aversion, competition between districts, need for visible outputs, over-reporting, etc.) which can lead to policy makers and implementors selecting easier-to-achieve targets
- Limited use of monitoring and evaluation beyond the objectives assessed within the performance contracts mentioned above. This translates into different stages of the causal chain receiving varied levels of attention instead of the adequate, systematic focus and resourcing required to meet national objectives
- There is insufficient access to private and public capital to scale up existing programs

Policy implementation is decentralized, and some challenges exist in prioritizing and coordinating among implementing partners

- Prioritization of programs and their execution may be influenced by projects which demonstrate immediate impact and visible progress at the expense of longer-term projects with potential for greater impact
- Human capacity constraints at district level limit the ability to effectively implement plans (e.g., in gender mainstreaming), coordinate with stakeholders and conduct monitoring and evaluation. Overlapping and siloed activities may result in duplication of efforts as well as gaps in coverage
Executive Summary

Approach and key insights from Diagnostic and Landscaping Analysis

Detailed Diagnostic Analysis

Detailed Policy and Stakeholder Landscaping

Next Steps: from Diagnostic to Action

Appendix
Diagnostic analysis is guided by 7 principles...

1. **Designed with the policy-maker in mind**: Presenting an interface that is concise, compelling and intuitive

2. **Outcome-oriented**: Linking indicators that reflect food system outcomes to the drivers that policy-makers can influence to realize transformation

3. **Anchored in existing structures**: Building on existing resources and structures with strong buy-in, such as the CAADP biennial review report, and adding new elements only where required

4. **Aligned to existing food systems frameworks**: Connecting to UN FSS Action Tracks for its outcome-orientation, and covering all components of the food system (as per HLPE framework)

5. **Enabling more detailed views in future**: Structuring analyses to be able to show disaggregated views of indicators in future phases

6. **Tailored to Africa and country context**: Adapting indicators to the countries' context, leveraging local data sources and reflecting local ambitions (co-developing where non-existent)

7. **Built upon a strong data-foundation**: Leveraging the best data (quantitative) and insights (qualitative) available and identifying gaps where they exist

... with an aim to:

- **Share a comprehensive, concise, and compelling diagnosis** of the current food system in Rwanda
- **Contribute and inform** the FSS in-country dialogues
- **Create an ongoing diagnostic and monitoring approach** to inform policy making and food systems transformation
- **Get feedback from food system stakeholders** to improve this diagnostic
This diagnostic analysis is informed by extensive research and feedback from key stakeholders in Rwanda’s food systems.

Research on Rwanda’s key food system elements:
- 5-part framework on food systems (based on the HLPE framework)
- 22 supra-indicators across the 5 UN FSS action tracks and 50+ key indicators
- Stakeholder and Policy landscaping

Feedback from various local experts and stakeholders across Rwanda’s food system e.g. Ministry of Agriculture, Ministry of Health, Development Partners, etc.

Emerging insights from the national, regional and district Food Systems Summit Dialogues to articulate food systems transformation gaps and potential ways to address them.

Note: See appendix for institutions engaged and please reach out to authors of this document for a detailed list of experts and stakeholders.
We want to thank the following people and organizations for their feedback and contributions:

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Extensive list of people and organizations is provided in the appendix.
Identification of main food systems challenges and potential game changing solutions
An iterative process with stakeholders and experts

Country’s performance on supra- and key indicators and review of existing policies

Insights from UN FSS Dialogues and potential game changers identified

Input from in-country experts on challenges and potential game changing solution

Interviews with stakeholders on challenges and potential game changing solutions

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Initial selection of main food systems challenges and potential game changing solutions

Validation with in-country stakeholders (ongoing)

Validated selection of main food systems challenges and potential game changing solutions

Detailed analyses and modelling of potential game changing solutions & alignment with stakeholders (phase 2)

Prioritized food systems challenges as the basis of policy and program design post UN FS Summit

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Identification of main food systems challenges and potential game changing solutions
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Interviews with stakeholders on challenges and potential game changing solutions

Current status
Rwanda | Initial synthesis of main FS challenges and potential game changers

**Priority challenges**

**Diet quality and Nutrition Security**
- Limited production diversity to meet population’s nutritional needs; some trade required to supplement locally available foods to deliver healthy diets for all

**Livelihoods equity**
- Limited income and income growth for farmers making agriculture unattractive and increasing urban migration

**Environmental resilience**
- High vulnerability to climate change and growing challenges from crop disease, insects, and changing biodiversity profile will lead to lower productivity and food availability

**Agricultural productivity**
- Production levels and yields are too low and inefficient production and processing will result in the inability to deliver sufficient food for the population

**Infrastructure capacity**
- Under-developed supply chains due to weak logistics infrastructure and limited private sector investment leading to high wastage and lower food quality

**Financing and investment**
- Too little financing channeled towards food production and agro-processing due to perceptions of risk leading to low processing capacity

**Potential game changing interventions**

**Diet quality and Nutrition Security**
- Strengthen end-to-end planning for nutrition-sensitive production (incl. seeds, input subsidies, price ceilings)
- Strengthen market linkages for trade
- Launch consumer-focused campaigns to improve diets
- Mainstream gender in accountability mechanisms
- Drive access to finance and skill development with innovation hubs
- Develop land leasing markets to promote credit access and scaling
- Do micro-irrigation
- Develop and promote climate-resilient crops
- Restore degraded systems for sustainable food production
- Develop early warning systems, to improve forecasting and monitoring
- Intensify production in a sustainable way (incl. land lease, targeted fertilizer blends, extension services, research on varieties, agroecology)
- Reduce food loss at each step of supply chain
- Map district, national and international food flows, link to infrastructure development for key value chains
- Support scale up of digital innovations
- Invest in cold storage at points of accumulation
- Design PPPs for investment in value chains, and distribution
- Improve access to insurance by strengthening the reinsurance market to transfer risks, digitalization to lower sales costs & claim handling
Diet Quality and Nutrition Security

**Key challenges and how they can be addressed**

**Why should this be a priority for Rwanda?**

- **Description of the priority area**
  - Rwanda has made important strides to increase food security from 48% (2006) to 81% (2018) and reduce stunting from 38% (2015) to 33% (2020)
  - Yet ~25% of the country has poor or borderline dietary diversity. Net food supply is not enough yet to meet needs of a healthy diet, with households reaching barely half of the recommended intake of micronutrients e.g., iron, zinc, Vit A, B12.
  - A healthy diet is unaffordable for ~90% of people and requires price-lowering strategies to be in place.
  - Focus has been on raising productivity of staple crops, additional steps needed to strengthen markets and grow demand for more nutrient-rich foods.

- **Benefits of addressing the challenge**
  By ensuring access to adequate, diverse diets, Rwanda can progress towards its 2024 goal to reduce stunting to 19% (and even beyond) to improve children’s quality of life and learning outcomes and increase overall health, wellbeing and productivity of its population.

**What challenges need to be overcome to address this?**

- **Trade-offs to consider**
  - More production of nutrient-rich foods for local consumption can reduce land available for cash crops for regional or export markets and reduce incomes.
  - Mixed and inter-cropping can produce diverse offer of foods, but reduces surpluses for individual farmers that help increase bargaining power and prices.
  - Animal source foods can fill micronutrient gaps but generate more emissions.

- **Policy opportunities**
  Current policies focus on priority staple crops (mostly carbohydrates) while production of and access to a more diverse set of nutrient-rich foods has received less attention.

**How and by whom can this be done?**

- **Need end-to-end planning for nutrition-sensitive agriculture**
  - Select high-nutrient seed varieties e.g., iron-rich beans.
  - Boost production of fruits and vegetables via input subsidies.
  - Promote household consumption of animal proteins from owned-sources e.g., poultry, pigs.

- **Leverage trade to boost flows of healthy foods across districts**
  - MINAGRI & MININFRA to strengthen market linkages, infrastructure e.g., cold chain to boost food-flows among districts.

- **Strategize for better consumption**
  - NCDA to research intra-household food distribution and MINALOC to promote village nutrition role models (male).
  - MINALOC to use procurement to deliver healthy food in schools, ECDs and other institutions.

**Benefits of addressing the challenge**

By ensuring access to adequate, diverse diets, Rwanda can progress towards its 2024 goal to reduce stunting to 19% (and even beyond) to improve children’s quality of life and learning outcomes and increase overall health, wellbeing and productivity of its population.

**Number of the associated supra-indicator**

1. Number of the associated supra-indicator
Livelihoods Equity | Key challenges and how they can be addressed

Why should this be a priority for Rwanda?

- **Description of the priority area**
  - Rwanda’s Vision 2050, NST1 emphasize agriculture as a channel for wealth creation
  - Majority of Rwandans are employed within low-productivity, low value-add production systems (1)
  - Low profitability constrains income, makes healthy diets unaffordable and raises livelihood vulnerability
  - Women are concentrated in less lucrative parts of the value chain, with fewer off-farm jobs (16), and larger care responsibilities for dependents
  - While a few financing instruments e.g., Women Guarantee Fund, exist, limited awareness, low financial literacy and limited control over decision-making hamper uptake

- **Benefits of addressing the challenge**
  - Rwanda’s Vision 2050 aims for inequality (as measured by GINI coefficient) to reduce to 0.3, from a baseline of 0.43 in 2017. Addressing inequality by growing income can reduce rural households’ dependency on social protection programs for their sustainability (6) and increase the ability of food systems to reduce poverty

What challenges need to be overcome to address this?

- **Trade-offs to consider**
  - Increased incomes can increase cost of labor, affecting production cost
  - Increasing agro-processing in rural areas provides jobs but also raises need for waste management infrastructure

- **Policy opportunities**
  - Need to clarify graduation mechanisms from social protection, improve coordination to limit dependency

- **Implementation challenges**
  - No incentives to attract agro-processors to rural areas with limited skilled labor, infrastructure and market linkages
  - Limited access to finance for micro-entrepreneurs and vulnerable groups
  - Constrained capacity in implementor to drive gender-responsive programming
  - While some households might be best supported to commercialize farming activities, others might require continued social protection programs; government needs to distinguish groups

How and by whom can this be done?

- All: Mainstream gender in accountability mechanisms e.g., imihigo, public hearings to drive ownership
- MINAGRI, MIGEPROF, MINALOC, MYCULTURE to accelerate participation of women and youth in short-cycle value chains e.g., fruits, vegetables
- MINAGRI, MIGEPROF, MYCULTURE to drive access to finance, skill development through innovation hubs
- MINALOC, MINAGRI to develop micro-irrigation (dry seasons) to enable smallholders move beyond rain-fed agriculture

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1 Number of the associated supra-indicator
Environmental Resilience | Key challenges and how they can be addressed

Why should this be a priority for Rwanda?

- Description of the priority area
  - Given agriculture’s economic importance, Rwanda’s high vulnerability to the effects of climate change and pests (e.g., fall armyworm) is troubling. This vulnerability will negatively impact production and contribute to food shortages and food price volatility.
  - Models predict possible shifts in timing of seasons and uncertain rainfall patterns, increased occurrence of floods and droughts. In 2015, agriculture contributed 55% of GHG emissions, followed by energy (31%), waste (12%) and industrial processes and product use (2%).

- Benefits of addressing the challenge
  - Rwanda has a legal, policy, and strategic framework to respond to climate change induced risks and economic losses. Promoting resilience, mitigation and adaptation to climate change contributes to achievement of Rwanda’s Nationally Determined Contributions (NDCs), protects life and livelihoods and preserves biodiversity.

What challenges need to be overcome to address this?

- Trade-offs to consider
  - Cultivating hill sides and fragile marshlands increases production, but raises costs to limit erosion and protect ecosystems.

- Policy opportunities
  - Inadequate resources to limit erosion on hills from increased farming activities.

- Implementation challenges
  - Dense and rapidly growing population
  - Forests are a primary energy source
  - Gap in evidence for contextualization and application of climate-smart agriculture practices and technologies
  - Limited access to information on early warning systems, particularly among vulnerable and isolated communities in an accessible and low-cost manner.
  - Financial limitations that add gaps in technical and technological capacity
  - Skepticism of insurance products

How and by whom can this be done?

- RAB to accelerate development and promotion of climate-resilient crops and livestock.
- MINAGRI, Min. Environment to jointly track indicators, share data on climate resilience.
- MINAGRI, Min. Environment to restore degraded systems for sustainable food production.
- Min. Environment and MINEMA to develop early warning systems, to improve forecasting, monitoring and assessment of risk vulnerability and share timely information.
- Min. Environment to explore private sector-led forest protection models.
- MINAGRI, Insurance players to integrate with extension, give timely payments for crop loss.
Agricultural Productivity | Key challenges and how they can be addressed

Why should this be a priority for Rwanda?

- Description of the priority area
  - Rwanda's actualized yields for major crops and livestock are much lower than potential yield
  - Rwanda's low-productivity and low-profitability production systems add to the need for more land to cultivate and more inputs (e.g., seed, fertilizer and effective extension services)
  - Low production of animal source foods due to high cost and limited availability of quality animal feed, improved breeds and vaccines
  - Need for professional post-harvest services, affordable food preservation and processing capacity to reduce post-harvest loss and costs, especially for perishable produce

- Benefits of addressing the challenge
  - Sustainably improving yield and profitability of production systems ensures that Rwanda can nourish a fast-growing population, provide incomes, and protect biodiversity for future generations. High quality production can also improve Rwanda's trade balance by reducing reliance on food and input imports, especially in the agro-processing sector

What challenges need to be overcome to address this?

- Trade-offs to consider
  - Increasing fertilizer usage can raise productivity but can raise costs and environmental impact (e.g., run off)
  - Centralized selection of focus crops, seed varieties and livestock breeds raises yields and surpluses, but can limit biodiversity and inhibit competitive market systems

- Policy opportunities
  - Existing policies need to articulate further how food production can be better linked with markets (district, national and global)
  - Need to articulate clear roadmap to 2030 emission reduction targets in the context of increasing livestock and fertilizer use

Implementation challenges

- Rapidly urbanizing population puts pressure on limited arable land
- Diverging assumptions on role and impact of agrochemicals
- Low uptake of modern technology, skill and knowledge gap among farmers especially on fertilizer and pesticides use

How and by whom can this be done?

- Prevent food loss
  - MINAGRI, MINICOM, MININFRA to enable higher levels of private sector engagement to fill value chain gaps: marketing (bulking, collecting, transport and retail)
  - Intensify production sustainably
  - RLMUA to strengthen use of the land rental/lease models
  - MINAGRI to accelerate soil and crop-specific fertilizer blends
  - MINAGRI & MINALOC to enhance extension services to improve skills of farmers in balancing chemical and organic fertilizer
  - RAB to continue research on high-profit potential varieties
  - Min. Environment, MINAGRI to mainstream agroecology practices, track joint indicators
  - MINAGRI and Private Sector to offer competitive insurance through groups of cooperatives

Sustainably improving yield and profitability of production systems ensures that Rwanda can nourish a fast-growing population, provide incomes, and protect biodiversity for future generations. High quality production can also improve Rwanda's trade balance by reducing reliance on food and input imports, especially in the agro-processing sector.

Number of the associated supra-indicator
Infrastructure Capacity | Key challenges and how they can be addressed

Why should this be a priority for Rwanda?

- Description of the priority area
  - Rwanda progressed in upgrading infrastructure e.g., 13,350 km of feeder roads in good/passable conditions (2017), with targets to develop ~30,000 km of feeder roads by 2027
  - Food loss and waste levels (1) are being researched, estimates ranging 10-40% for different value chains
  - Need for stronger postharvest handling capacity (including drying grounds, silos and cold chain) and skill to reduce losses (e.g., from aflatoxin, pests)
  - Shortage of food processing, manufacturing capacity highlighted by COVID-19 pandemic
  - Timely access to accurate information and right type of innovation and tech are critical enablers

- Benefits of addressing the challenge
  Better infrastructure minimizes losses & maintains quality of food and reduces the need for food processors to import raw inputs. Because of safety and quality concerns, ~80% of premium maize is imported, depriving local farmers from income and driving import-reliance. Minimizing loss and waste lowers environmental impact of production and avails more food for domestic consumption.

Trade-offs to consider

- Increased risk now from uncertain investments in infrastructure can reduce long-term need for funds for recurring costs e.g., social protection programs

Policy opportunities

- Limited articulation of the role and need for ICT with gaps in data management, sharing and integration along value chains
- Investment plans in PSTA-4 to improve linkages between production and processing need spatial specificity to explicitly target districts with high production and connect them to districts with production shortages

Implementation challenges

- High cost of infrastructure projects that require upfront fundraising, while managing expenditures on the ground
- Limited capacity to manage operations leading to infrastructure under-utilization and quality degradation
- High cost of energy and transport

How and by whom can this be done?

- MINAGRI and MININFRA to map district, national and international food flows, link the information to infrastructure development and maintenance plans for each value chain
- MINICT, MINAGRI & Private sector to continue developing and supporting scale up of relevant digital innovations to enable uptake by farmers
- NISR to expand metrics on food loss to the whole value-chain
- MINAGRI to reduce farm-based post-harvest handling for value-chains e.g., maize
- Promote private investment in building and maintenance of post-harvest infrastructure and services
- Private sector to invest and operate infrastructure at points of accumulation e.g., markets

Number of the associated supra-indicator

1
Description of the priority area

- While 93% Rwandans have access to a financial institution, access to credit facilities for agricultural investments remains low and constrains productivity and commercialization: only 5.2% of credit went to agriculture in 2017.
- Drivers include lack of collateral, weak financial literacy, high risks and costs for banks and insurers to service smallholders.
- Low insurance penetration rate (< .5%) despite the National Agriculture Insurance Scheme (NAIS), a government-subsidized risk mitigation and insurance platform with private insurers.
- High cost of energy (e.g. for irrigation) slows uptake.

Benefits of addressing the challenge

- Improving access to affordable credit and growing insurance coverage by trusted insurers will enable food producers, processors, transporters and distributors to competitively scale and market their goods locally and regionally.

Trade-offs to consider

- Encouraging farmers to invest in insurance vs purchasing tangible inputs.
- Prioritizing de-risking for large private entities vs de-risking for smallholder farmers.
- High opportunity costs to capital in agriculture vs. other sectors.

Policy opportunities

- Limited inter-ministerial coordination to support implementors, align trade-offs across food systems.
- Links between social protection programs and insurance coverage absent.

Implementation challenges

- Limited long and medium-term liquidity in SACCO and microfinance institutions.
- It is difficult for financial institutions to access business and transaction records and historical data on yields, losses etc.
- Despite government subsidy, there is a perception that insurance premiums are too high.

Set-up suitable governance

- Develop robust system of inter-ministerial coordination to support implementors.
- Increase access to finance.
- Remove regulatory barriers to encourage greater levels of private engagement in the space.
- Build a competitive environment to encourage investment in value chains, distribution channels.
- MINAGRI to partner with actors e.g., AFR to de-risk producers, processors and offer guarantees to ensure affordable financing.

Increase access to insurance

- Strengthening the reinsurance market to transfer risks.
- Private sector participation in extension for farmer sensitization on insurance.
- Digitalization to lower costs of sales, claims payment time.
Diagnostic analysis | A 5-part framework to describe the food system

1. Food environments & consumer characteristics
   - Food availability
   - Food affordability
   - Food messaging
   - Consumer characteristics
   - Consumer behavior
   - Food safety

2. Food supply chains
   - Input supply
   - Processing and packaging
   - Food production systems
   - Retail and marketing
   - Storage and distribution
   - Food safety

3. Subnational food systems

4. Cross-cutting themes
   - Gender
   - Youth
   - Human rights

5. External drivers
   - Environment & climate: minerals, water, biodiversity, land and soils
   - Globalization and trade
   - Income growth and distribution
   - Urbanization
   - Demographic shifts
   - Leadership and Governance
   - Socio-cultural context
   - Finance & Capital
   - Energy
   - Science, Technology, and Innovation

Source: Adapted from the Food Systems Dashboard, the Food systems Decision-Support Toolbox; HLPE; and FS-TIP research
## High-level view | Food environments and consumers characteristics

| Food availability | ~19% of households are food insecure, mostly located in Western, Southern and Northern Provinces
- Staple foods in Rwanda include bananas, maize, cassava, wheat, groundnuts, beans, sorghum, cassava and sweet potatoes
- Government efforts to promote food security primarily focused on production of priority crops (mostly carbohydrates)
- Low access to modern grocery, with informal markets that meet 2-3x/week dominating
- Production for staple and non staple foods insufficient to meet diet needs, gap filled by imports |

| Food affordability | A healthy diet cost 245% of household food expenditure, which is unaffordable for ~90% of the population
- A nutrient adequate diet costs ~87% of household food expenditure and is unaffordable for ~49% of the population
- An energy-sufficient diet costs ~30% of household food expenditure and is unaffordable for ~3% of the population
- Poorer households (45% of households in Ubudehe 1&2) typically consume 1-2 meals per day with diets made of ugali (maize flour), beans, sweet potatoes, cassava, occasionally indagara (small fish), tomatoes, onions, green vegetables
- Limited income means purchasing food and cooking fuel is done daily at local kiosks/duka and average expenditure per household at RWF 1,000 - 2,000 per day and cooking material (wood, charcoal, and gas) can form a significant proportion of expenditure in meal preparation. |

| Food messaging | Limited control on marketing of unhealthy foods, consumers assume more processed foods are safer and better for you
- Food-based dietary guidelines for Rwanda are in development, while requirements for mandatory nutrition facts are not yet in place |

| Consumer characteristics | Misconception that ultra-processed foods are more nutritious and that refined grains are safer than whole-grains
- While spending power of consumers has increased drastically in the last 20 years, ~40% of the population was still living below the national poverty line by 2014
- 16% of the population live below the extreme poverty line determined as the food cost to achieve 2,500 Kcals per day per adult equivalent unit is set at RWF 105,064 per year (January 2014 prices) limiting the ability to purchase foods
- Culture affects food handling practices e.g., cassava fermentation methods which increase levels of aflatoxins
- Increasing demand among consumers for processed foods
- Low dairy consumption of ~68L milk per person per year (vs. 200L pppy recommended by WHO) |

| Consumer behavior | A typical Rwandan diet consists of cooking bananas, Irish and sweet potatoes, dry beans, cassava and some other vegetables. Beans and sweet potatoes make up the highest contribution to calories nation-wide
- Traditionally, Rwandans consume a lot of beans as part of their diet, with (one of the) highest per capita bean consumptions (29kgs pppy)
- Culture affects food handling practices e.g., cassava fermentation methods which increase levels of aflatoxins
- Increasing demand among consumers for processed foods
- Low dairy consumption of ~68L milk per person per year (vs. 200L pppy recommended by WHO) |

---

1. CFSVA 2018 2. USAID Staple Food Value Chain Analysis, 2009 3. FAO State of Food Security and Nutrition in the World 2020; 4. Ubudehe 1 and 2 are social protection categories that include the most vulnerable households. Towards the end of 2020, the government introduced a new Ubudehe classification system with households classified from A to E. Households in category E are the poorest and receive full state social protection including solar electrical subsidies, community-based health insurance, fortified blended foods and Girinka 5. UNDP 6. EICV5 2017 7. GAIN Marketplace for nutritious foods Rwanda Landscape Report, 2016 8. CGIAR, 2014 9. FAO, 2019
## High-level view | Food Supply Chains (I/II)

### Input supply
- Government subsidizes inputs for priority crops—maize, wheat, rice, Irish potato, beans, and cassava—including distribution of certified seeds, chemical fertilizer, and irrigation; driving up starch production and consumption
- Rwanda’s seed sector is diverse with supply coming from different sources depending on the type of crop: farmer-saved seeds (local food crops), intermediary sources (food and cash crops), public sector (major foods and cash crops) and private (high value crops)
- Government programs e.g., Girinka, provide cows, small stock (pigs, chicken, etc.) to poor households to build income

### Food production systems
Rwanda is characterized by a family-farm centric model, with high levels of land fragmentation leading to small land holdings (~90% <1ha); government has tried to address with its land consolidation policy with limited results to date
- Agriculture is main source of income for rural households with ~70% of population farming at the subsistence level
- 42% of adults generating an income from farming activities and 12% from farm work wages
- An estimated 70% of domestic cropland is on slopes, risking erosion and making mechanization more challenging

Various programs have been set-up to improve productivity and livelihoods
- Crop Intensification Program (CIP), which facilitates access to inorganic fertilizer and improved seeds and Girinka, which provides poor households with a crossbred dairy cow, are examples of programs seeking to improve livelihoods
- Since 2007 Rwanda has a Crop Intensification Program (CIP) that focusses on monocropping and commercialization of priority crops: maize, wheat, rice, Irish potato, beans, and cassava; overall productivity of crops remains low
- The top 7 crops produced by weight were bananas, sweet potatoes, cassava, potatoes, plantains, beans and maize

Production of animal source foods has been rising, but remains relatively low
- Production of milk, meat, fish and eggs has been on the rise; increasing by 2%, 3.7%, 0.02%, 0.5% YoY (2018 to 2020)
- Only 8% of country is covered by water, with little fishing taking place (31,465 MT produced in 2019)

### Storage and distribution
- Limited infrastructure for food storage and transportation and high transaction costs for farmers
- High level of food loss (~10% vegetables, 11% fruits, ~7% cereal), with some sources citing up to 40% loss in specific value chains, with a big aflatoxin issue (~10% sampled maize from 15 districts)
- Rural areas lagging far behind urban areas in access to electricity (26% vs. 93%)

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### High-level view | Food Supply Chains (II/II)

| Processing and packaging | Agro-processing contributed US$451M to GDP (62% of total manufacturing output), with a CAGR of 6% (2015-2020)<sup>1</sup>  
- 4.6K agro-processing establishments (~33K workers)<sup>2</sup>, with most jobs found in tea, coffee, maize and cassava processing  
- Most (88%) agro-processors are micro with 1-3 employees while just 0.7% are defined as large (100+ employees)<sup>3</sup>. The larger agro-processors include Africa Improved Food, Azam, MINIMEX, Inyange Industries, Sosoma, & Kinasi Cassava  
Expensive inputs and limited local demand can form a barrier to growth  
- Larger processors rely on imports for most inputs, smaller processors source locally but are at risk of price fluctuations<sup>4</sup>  
- Price fluctuations/variability in inputs maintains fluctuation in end-products (e.g., chicken/animal feed is highly variable, causing further downstream variability in the prices of meat and dairy)  
- Packaging materials incl. plastics, glass, and foil are sourced internationally as demand in Rwanda is still too low to attract investment in domestic production. Packaging can account for a big share of the final cost of processed food  
More collaboration in the region and between actors might be beneficial  
- Lack of locally available operational capacity, requires investment in training schemes & hiring from EAC region  
- Collaboration among producers, processors, retailers & exporters on nutrition-sensitive production and trade is limited |

| Retail and marketing | Markets are largely informal (92% of enterprises in wholesale and retail trade are micro-enterprises)<sup>5</sup>, with formal retail channels concentrated in urban centers  
- Rwanda has 540 markets with 10,143 traders with at least one main market in each district<sup>11</sup>  
- Time to access markets is higher in rural vs. urban areas (57 minutes vs 24 minutes)<sup>1</sup>. In villages without a market, it takes ~86 minutes on average to reach the nearest market<sup>6</sup>  
- Longer time taken in the districts of Rutsiror (145 minutes), Nyaruguru (122 minutes), Nyamasheke (111 minutes) and Kayonza (109 minutes) mainly due to the steep landscape, a lower road network coverage or poor road conditions<sup>6</sup> |

| Food Safety | There is very limited control on marketing of unhealthy foods and limited view on food safety in the country as overall number of certified foods in the market is low and laboratory testing capacity is low  
- Perceptions around safety and nutrition of food can vary, for example, sensory studies of maize flour indicate consumer preferences for whiter flours as white is associated with cleanliness  
- Few processors meet formal standards including ISO, Rwanda S-Mark or Rwanda FDA approval |

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### High-level view | Subnational food systems

| Subnational food systems | Rwanda is divided into 5 provinces (Northern, Eastern, Western, Southern and City of Kigali) and 30 districts<sup>1</sup>  
- The western and north-central regions are made up of mountains and foothills with elevations that exceed 2000 meters, cool and wet climate and annual rainfall of 1200-2000 millimeters<sup>1</sup>  
- The eastern plateau comprises hills that gradually level into flat lowlands, a few hills and lake-filled valleys with elevation generally below 1,500 meters, warmer and drier climate and the average annual rainfall is in the range of 800-1,200 millimeters<sup>1</sup>  

**Weather, climate and food (in)security vary by region**  
- The most reported shocks were weather-related, such as drought, irregular rains, or prolonged dry spells, which mainly affected the Eastern and Southern Provinces<sup>1</sup>  
- Household food insecurity varies by region, with the Western Province having the highest prevalence (29.9%), followed by the Southern Province (20.5%), Northern Province (17.8%) and Eastern Province (16.2 %) and the City of Kigali (2.2%)<sup>1</sup>  

**Various programs are aimed and transformation of lands and increasing productivity across regions**  
- The Land Husbandry, Water Harvesting and Hillside Irrigation (LWH) is a flagship program of the government that aims to transform hillside production, increasing productivity in an environmentally sustainable manner<sup>2</sup>  
- Crop Intensification Program (CIP), which facilitates access to inorganic fertilizer and improved seeds and Girinka, which provides poor households with a crossbred dairy cow, are examples of programs seeking to improve livelihoods  

**Income has a big influence on consumer habits**  
- Wealthier households (55% of households in Ubudehe 3&4) eat three times per day with some snacking. Cooking is done twice per day with assistance from house help. Diets are comprised of eggs, milk, rice, beans, pasta, fresh vegetables, fish, meats (beef or Pork) and occasionally chicken  
- Wealthier households in Kigali spend RWF 80,000 to 100,000 per week on food and can afford bulkier purchases meaning weekly shopping in markets for perishables like vegetables and meats and monthly for basics like rice, flours and packaged food like cornflakes, tea, sugar, etc.  

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### Gender

- Rwanda ranks 2nd of 54 African countries on the Mo Ibrahim Gender Index, with a score of 76.1/100\(^1\)
- Law allows equitable 50% of women access to land and agricultural inputs\(^2\), however, especially in rural areas, they have limited control over resources and decision making in households and communities
- 25% of households are headed by females, 6% of households were headed by females in the absence of a male head\(^3\)
- 63% of working females are in agriculture related occupations compared to only 43% among working males\(^3\)
- Women carry a disproportionate work burden in the household which constrains their participation in economically productive activities\(^4\)
- 60% of men and 38% of women own a cell phone\(^5\)

### Youth

- 50% of Rwandans are under 20 years; youth population (16-30 years) makes up 26.6% of the total population of Rwanda\(^6\)
- Working age youth (15-34) comprise 77% of rural population\(^7\)
- In 2015, unemployment amongst people aged 16-24 years is twice as high as that of the 35-44-year age group\(^8\)
- Farming is the largest source of employment for young people: >50% of youth (16-24) work exclusively in agriculture\(^9\)

### Human Rights

- Rwanda’s constitution references the country’s history with a focus on integration of ethnic communities, eradication of discrimination and promotion of national unity
- Rwandan culture serves as a source of home-grown solutions to deal with matters that concern Rwandans
- The constitution promotes rights for all Rwandans including equality before the law, protection from discrimination, right to education, good health, free choice of employment and participation in government and public services
- The country ranks:
  - 104th of 113 countries in 2020 food security index\(^10\) - ~19% of the population is food insecure vs 10% global average
  - 33rd of 179 countries in 2020 Index of Economic Freedom\(^11\) indicating a relatively high degree of freedom for individuals to work, produce, consume and invest, with that freedom protected and unconstrained by the state

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High-level view | External drivers of the food system (I/II)

**Environment and climate**
- Country consists mostly of hillside land (close to 70%) which is prone to erosion and leaching of minerals
- Climate change expected to result in increased temperatures (up to 2.0 °C by the 2030s from 1970), intensified rainfall (-100 mm and +400 mm in annual rainfall between 2000-2050) and prolonged dry seasons
- High Vulnerability to global pests e.g., Fall Armyworm (FAW) which spread from Latin America and invaded maize in all 30 districts in 2017

**Globalization and Trade**
- Exports of goods and services was 21.8% of GDP while imports of goods and services were 36.1% of GDP in 2019
- Tea and Coffee are Rwanda’s two major food exports generating ~$150M per annum in export revenue
- Rwanda is a net importer of food. In 2020, Rwanda imported $370M in food and beverages (~10% of total food market in the country). Local rice and wheat production are below demand with imports filling the gap, resulting in a dependency ratio ~40%
- In the past 5 years, agro-processed food, which is either formally or informally exported to regional markets, has emerged as an important export sector and now accounts for ~5% of total goods exports

**Income growth and distribution**
- Income is unevenly distributed (Gini index 44/100); trend has been towards more equal distribution (47/100 in 2010)
- Agriculture is an important source of income for Rwanda, with value added accounting for 23.5% of GDP in 2019
- The “Made in Rwanda” policy supports the food sector by promoting creation of 200K/year off-farm jobs and income

**Urbanization**
- ~17% of the population lives in urban areas, mostly in Kigali. Rwanda has an annual urbanization growth rate of 4.5%, which is higher than Africa’s urban growth rate of 3.2%
- Population density of the country is one of highest in the world at 499 people per square km of land and over 10x that of Sub-Saharan Africa average

**Demographic shifts**
- Population of ~13M (2021), which is projected to increase to between 15.4M and 16.9M by 2032
- ~50% of Rwandans are under 20 years of age and working age youth (15-34) comprise 77% of rural population
- An increasing population, combined with unmet demand for jobs leads to additional pressure on small land holdings
### Leadership and Governance
- Rwanda is a presidential republic, with policy development centralized at the national level; implementation driven through 30 districts (smallest has a population of 284K, largest 531K).
- Presidential elections occur every 5 years, with the latest in 2017.

### Socio-cultural context
- Women have taken a more prominent role in the country since the genocide (e.g., 64% of members of parliament) and gender equality and women’s empowerment must be included in all development frameworks.
- Barriers in terms of access to land and finance persist and negatively impact production and equity.

### Finance & Capital
- 93% of the population 16 years or older use financial products or services, whether formal or informal.
- Access to finance (credit) for farmers is limited, with only ~6% of bank loans going to agriculture (2014-2018).
- Only 27.5% of men and women in agriculture had access to financial services (2015-2018).

### Energy
- 228.2 MW electricity generated (2020), with 556 MW targeted in 2024.
- 51% Rwandan households have access to electricity (national grid (37%), off-grid systems (14%)).
- Rural areas lagging far behind urban areas in access to electricity (26% vs. 93%).
- The cost of gas, wood and charcoal are major determinants of how to cook: gas is quick and clean but more expensive, charcoal is good for products that require long boiling periods e.g., beans. Wood is the cheapest and is less optimal under all cooking conditions but used for longer cooking periods.
- Recently the government has started blocking use of charcoal and wood, due to environmental and health damage.
- ~80% energy consumption is based on biomass (2017), with a target of reducing biomass usage for fuel to 42%(2024).

### Science and technology
- Rwanda invested 0.44% Ag GDP in agricultural R&D in 2016 and had 2.9 research FTEs per 100K farmers (excluding private and for-profit sector).
- 57% of research FTEs focused on crops, while 17.8% focused on livestock. Natural resources had 5.0% FTEs, while forestry had 1.7% and fisheries had 1.8%.
- Rwanda Agricultural Board (RAB) leads research and coordination of research actors, infrastructure upgrading and human resource strengthening. RAB collaborates with higher education agencies and the private sector.
- Emerging research areas include horticulture, biotechnology, post-harvest and food processing and climate change.
Executive Summary
Approach and key insights from Diagnostic and Landscaping Analysis

**Detailed Diagnostic Analysis**
Detailed Policy and Stakeholder Landscaping
Next Steps: from Diagnostic to Action
Appendix
Overview of Rwanda's Food System through Supra-Indicators
# Current status of Rwanda's food system captured in supra-indicators

<table>
<thead>
<tr>
<th>Action Tracks</th>
<th>Supra-indicators</th>
<th>Rwanda</th>
<th>World</th>
<th>Unit</th>
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<td><strong>Ensure access to safe and nutritious food for all</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Diet quality: Food Consumption Score (FCS)</td>
<td>Poor: 4%</td>
<td></td>
<td>Percent</td>
</tr>
<tr>
<td>2</td>
<td>Nutrient supply: Net supply in country of key macro and micro nutrients as a share of total consumption requirements for a healthy diet</td>
<td>Below sufficient production</td>
<td>N/A</td>
<td>Percent</td>
</tr>
<tr>
<td>3</td>
<td>Undernourishment: Percent of population undernourished</td>
<td>35.6</td>
<td>8.9</td>
<td>Percent</td>
</tr>
<tr>
<td>4</td>
<td>Overweight &amp; obesity: Percent of population overweight or obese(adult population)</td>
<td>22.0</td>
<td>39.1</td>
<td>Percent</td>
</tr>
<tr>
<td>5</td>
<td>Food safety: Food Safety Systems Index</td>
<td>60</td>
<td>75.34</td>
<td>Index (0-100)</td>
</tr>
<tr>
<td><strong>Shift to sustainable consumption patterns</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>6</td>
<td>Affordability: Cost of a healthy diet as a percent of household food expenditure</td>
<td>245</td>
<td>95</td>
<td>Percent</td>
</tr>
<tr>
<td>7</td>
<td>Sustainability of diets: Per capita GHG emissions of food consumption</td>
<td>1094</td>
<td>2603</td>
<td>Kg CO2eq./person</td>
</tr>
<tr>
<td>8</td>
<td>Food waste: Food waste index</td>
<td>208</td>
<td>121</td>
<td>kg/capita/year</td>
</tr>
<tr>
<td>9</td>
<td>Food environment: Composite index combining food environment policies</td>
<td>3</td>
<td>N/A</td>
<td>Index (0-14)</td>
</tr>
<tr>
<td><strong>Boost nature-positive production</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Emissions: Green House Gas (GHG) emissions from agriculture</td>
<td>3.44</td>
<td>30.1</td>
<td>MtCO2e</td>
</tr>
<tr>
<td>11</td>
<td>Land: Average forest land being deforested for agriculture use over past 3 years</td>
<td>1.11</td>
<td>0.17</td>
<td>Percent</td>
</tr>
<tr>
<td>12</td>
<td>Food loss: Percent food loss across supply chain</td>
<td>7-11</td>
<td>4-8</td>
<td>Percent</td>
</tr>
<tr>
<td>13</td>
<td>Regeneration: Biodiversity and habitat index</td>
<td>47.3</td>
<td>54.5</td>
<td>Percent</td>
</tr>
<tr>
<td><strong>Advance equitable livelihoods</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Income: Gini coefficient (specific) based on incomes across the food system</td>
<td>Not published</td>
<td>N/A</td>
<td>Coefficient (0-1)</td>
</tr>
<tr>
<td>15</td>
<td>Income: Gap between farmgate price and retail price</td>
<td>119%</td>
<td>N/A</td>
<td>Percent</td>
</tr>
<tr>
<td>16</td>
<td>Gender equity: Women empowerment in agriculture index</td>
<td>0.924</td>
<td>N/A</td>
<td>Index (0-100)</td>
</tr>
<tr>
<td><strong>Build resilience to vulnerabilities, shocks and stress</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>17</td>
<td>Economic: Household Resilience Capacity Index</td>
<td>No data</td>
<td>N/A</td>
<td>Index</td>
</tr>
<tr>
<td>18</td>
<td>Risk distribution: Proportion of men and women engaged in agriculture with access to macro and micro credit financial services</td>
<td>28%</td>
<td>N/A</td>
<td>Percent</td>
</tr>
<tr>
<td>19</td>
<td>Social: Government social security budget as a % of total requirements to cover vulnerable social groups</td>
<td>83.23%</td>
<td>N/A</td>
<td>Percent</td>
</tr>
<tr>
<td>20</td>
<td>Environmental: ND-GAIN (Notre Dame Global Adaptation Initiative) Country Index</td>
<td>43.1</td>
<td>49.0</td>
<td>Index(0-100)</td>
</tr>
<tr>
<td>21</td>
<td>Production diversity: Percent of kilograms from top 5 crops produced</td>
<td>70</td>
<td>N/A</td>
<td>Percent</td>
</tr>
<tr>
<td><strong>Governance</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>22</td>
<td>Governance: Food Systems Transformation Governance Index</td>
<td>7</td>
<td>N/A</td>
<td>Index (0-14)</td>
</tr>
</tbody>
</table>
Action Track 1: *Ensure access to safe and nutritious food for all*
Food consumption score (FCS)

Aggregates household-level data on diversity and frequency of food groups, weighting according to the relative nutritional value.

Food Consumption Score

- **2018**: Adequate FC 76%, Borderline FC N/A, Poor FC N/A

Drivers - Key leading indicators

- **Production**: -24% of Rwandans do not have a diverse enough diet (poor or borderline FCS), in part due to monocropping, which affects household and market availability of nutrient-rich foods (See *supra-indicator 2* for nutrient specific details on production).
- **Inputs**: Kitchen gardens, have increased production of nutritious foods, but the land area is often too small to provide households with year-round access.
- **Availability**: Households seem incentivized to aggregate and sell high quality nutritious food, e.g., fruit and vegetables, to capture economic gain while retaining voluminous staples to consume.
- **Socio-culture**: Food preparation, intra-household distribution and consumption based on culturally acceptable practices, instead of nutritional sensitivity.
- **Food Utilization**: The typical diet consists of bananas, Irish or sweet potatoes, beans and other vegetables.

Outcomes - Key lagging indicators

- **Undernourishment**: 35.6% of population undernourished in 2019 (see *supra-indicator 3*).
- **Overweight & obesity**: -21% of population overweight or obese (see *supra-indicator 4*).
- **Food insecurity**: -19% households are food insecure (see *supra-indicator 3*).
- **Stunting**: -33% of children are stunted, with more affected in rural areas (36%) than in urban areas (20%)(see *supra-indicator 3*).

Summary

**Trend**: Adequate Food Consumption Score has been relatively steady, between 76%-79% since 2009.

**Target**: No national targets or global targets set on recommended FCS. Desired score is 100% with adequate Food Consumption.

**Implications and potential interventions**

- Improved dietary diversity impacts health, wellbeing and productivity.
- Rwanda leads the world in bean consumption, with 79-88% of beans eaten by a household from own production; this is a potential lever to increase nutrient intake.
- Potential interventions include:
  - Providing access to nutrient-rich foods to vulnerable populations by expanding programs e.g., Girinka, small stock and tracking outcomes e.g., social protection graduation.
  - MINEDUC, MINAGRI expanding school feeding programs (including Early Childhood Development centers) to ensure healthy diets, linking this effort to public food procurement to stimulate ASF production and consumption.
  - MOH, MINAGRI researching drivers of nutrition-sensitive purchase, food preparation and distribution, tailoring solutions e.g., trade, social and behavior change communication, training.
  - MOH, MINAGRI, FDA to promote consumption of fortified staple products via consumer education.

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*Click for Meta data: Sources*
Net supply in country of key macro and micronutrients as a share of total consumption requirements for a healthy diet

Drivers - Key leading indicators

- **Production**: Low productivity of staple and non-staple foods; food production (e.g., kilocalories from crops, ~1950 kcal/person/day, is below food poverty line defined as access to 2500 kcal/person/day). Production not yet sufficient.
- **Supply gaps** observed in calcium, iron, zinc, vit. B12, and vit. A at both production, distribution and consumption.
- **Limited Trade**: Imports from neighboring countries and trade between districts can help fill supply gaps, especially where imports are more affordable. Yet international trade is constrained by protectionism and sometimes, political disputes.

Outcomes - Key lagging indicators

- **Undernourishment**: 35.6% of population undernourished. (see supra-indicator 3).
- **Diets**: Only 28% of women receive Minimum Dietary Diversity, a rate which increases with wealth and consumption of fortified blended food.

Summary

**Trend**: Rwanda has made important strides to increase food security from 48% (2006) to 81% (2018), yet production is below macro and micronutrient needs. Imports fill gaps in nutrients e.g., folate and alternative sources needs for remaining nutrients.

**Target**: To ensure adequate availability of nutrients in country.

Implications and potential interventions

- Building on improved food security, the focus needs to expand to include household access to nutrients.
- Possible interventions could include:
  - Creating an enabling business environment for producers and processors of nutrient-rich foods for the domestic market.
  - RRA reducing taxes on healthy food produce and processing to encourage healthy food choices where possible.
  - MINAGRI partnering with Private Sector to provide the investment and operational capacity to develop, manage infrastructure for increased production, storage and distribution of perishable food.
  - MINAGRI, cooperatives, investors developing alternative protein sources with limited environment impact (e.g., small pelagic fish) and underlying cold chain.
  - MINAGRI, NCDA promoting selling and consumption of nutritious but neglected crops and biofortified crops through community nutrition leadership programs.

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<table>
<thead>
<tr>
<th>Net Nutrient Supply (from production)¹</th>
<th>Drivers - Key leading indicators</th>
<th>Outcomes - Key lagging indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kilocalories</td>
<td>Production: Low productivity of staple and non-staple foods; food production (e.g., kilocalories from crops, ~1950 kcal/person/day, is below food poverty line defined as access to 2500 kcal/person/day). Production not yet sufficient.</td>
<td>Undernourishment: 35.6% of population undernourished. (see supra-indicator 3).</td>
</tr>
<tr>
<td>Calcium</td>
<td>Supply gaps observed in calcium, iron, zinc, vit. B12, and vit. A at both production, distribution and consumption.</td>
<td>Diets: Only 28% of women receive Minimum Dietary Diversity, a rate which increases with wealth and consumption of fortified blended food.</td>
</tr>
<tr>
<td>Iron</td>
<td>Limited Trade: Imports from neighboring countries and trade between districts can help fill supply gaps, especially where imports are more affordable. Yet international trade is constrained by protectionism and sometimes, political disputes.</td>
<td></td>
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<tr>
<td>Zinc</td>
<td></td>
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<tr>
<td>Vit. B12</td>
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<tr>
<td>Vit. A</td>
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Country target | Global target |
<table>
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</thead>
<tbody>
<tr>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

---

**Minimum Dietary Diversity-Women (MDD-W) by wealth (2018)**

- **2021**
  - Not sufficient
  - N/A

**Summary**

**Trend**: Rwanda has made important strides to increase food security from 48% (2006) to 81% (2018), yet production is below macro and micronutrient needs. Imports fill gaps in nutrients e.g., folate and alternative sources needs for remaining nutrients.

**Target**: To ensure adequate availability of nutrients in country.

---

**Drivers**

1. **Production**: Low productivity of staple and non-staple foods; food production (e.g., kilocalories from crops, ~1950 kcal/person/day, is below food poverty line defined as access to 2500 kcal/person/day).
2. **Supply gaps** observed in calcium, iron, zinc, vit. B12, and vit. A at both production, distribution and consumption.
3. **Limited Trade**: Imports from neighboring countries and trade between districts can help fill supply gaps, especially where imports are more affordable. Yet international trade is constrained by protectionism and sometimes, political disputes.

**Outcomes**

1. **Undernourishment**: 35.6% of population undernourished. (see supra-indicator 3).
2. **Diets**: Only 28% of women receive Minimum Dietary Diversity, a rate which increases with wealth and consumption of fortified blended food.

---

**Implications and potential interventions**

- Building on improved food security, the focus needs to expand to include household access to nutrients.
- Possible interventions could include:
  - Creating an enabling business environment for producers and processors of nutrient-rich foods for the domestic market.
  - RRA reducing taxes on healthy food produce and processing to encourage healthy food choices where possible.
  - MINAGRI partnering with Private Sector to provide the investment and operational capacity to develop, manage infrastructure for increased production, storage and distribution of perishable food.
  - MINAGRI, cooperatives, investors developing alternative protein sources with limited environment impact (e.g., small pelagic fish) and underlying cold chain.
  - MINAGRI, NCDA promoting selling and consumption of nutritious but neglected crops and biofortified crops through community nutrition leadership programs.
Prevalence of undernourishment (% of population)
Percentage of the population whose food intake is insufficient to meet dietary energy requirements continuously

Drivers - Key leading indicators
- Food insecurity: ~19% of Rwandan households are food insecure. In the West, food insecurity is linked low-income agriculture, and acidic, depleted soils which have lower productivity.

Outcomes - Key lagging indicators
- Stunting: 33% of children (<5y) are stunted. Stunting in the North linked to poor sanitation and hygiene facilities and repeated infections.
- Malnutrition: -2% of children (<5y) suffer from acute malnutrition, linked to poor diet in first 1000 days and poor complimentary feeding practices; only 56% of children aged 6-8 months receive complementary foods.

Implications and potential interventions
- Rwanda aims to reduce stunting to 19% by 2024 and the proportion of food insecure households to 10% by 2024.
- With a rising population, pressure on limited land and agricultural production -40-50% below potential, Rwanda risks stagnating and even declining on progress made to reduce stunting and undernourishment.
- Potential interventions include:
  - MINAGRI, MOH customizing regional interventions e.g., strengthening strategic food reserves in regions with chronic food insecurity to ensure access, while aligning with efforts to encourage local sourcing among food processors.
  - MINAGRI designing incentives to drive retention of nutritious food for consumption instead of sale.
  - NCPA designing solutions for working caregivers e.g., easy to carry, affordable complementary food options for rural mothers who bring children to the farm.
% of population overweight or obese (adult population)
Percentage of the population (men and women) with excessive fat accumulation that presents a risk to health

Drivers - Key leading indicators
- Urbanization: Higher obesity and overweight in children (<5y) in urban areas (11%) than rural areas (7%) linked to rising sedentary behaviours in urban areas. Weight gain is seen as a sign of affluence
- Gender: 29.5% women and 14% of men are overweight or obese (BMI). Women 2-3x more likely to be overweight and obese, with higher rates in more educated women and wealthier households

Outcomes - Key lagging indicators
- NCD mortality rate (100,000 inhabitants): ~45% of deaths in 2016 were attributed to NCDs. Overweight and obesity contribute to cardiovascular diseases and diabetes

Implications and potential interventions
- Rwanda’s head start in a relatively low obesity/overweight needs to be maintained to prevent the double burden of malnutrition and gain from avoided NCD costs
- With the population projected to double to 23M by 2050 and rapidly urbanize, cities and peri-urban towns need to enable healthier diets and reduce sedentary habits
- The urban imperative is to shape consumption patterns towards more healthy diets while building demand and willingness to pay
- Possible interventions include:
  - Cities investing in adequate levels of transport, storage and market infrastructure for nutritious foods
  - FDA collaborating with private sector to develop guidelines on food marketing & messaging
  - MOH, NCDA targeting urban populations with Behavior Change Communication Campaigns on healthy eating at buffets, which tend to be the urban norm
Africa food systems safety index
Combines three food safety indices: food safety systems index, food safety health index and food safety trade index

Drivers - Key leading indicators
- **Mandate**: Food safety systems still show substantial gaps and need adequate infrastructure and controls to ensure safety of processed and unprocessed foods. Several agencies share responsibility for food safety with mandates that overlap and are in some instances contradictory.
- **Processing capacity**: Capacity to do quality testing constrained by centralized testing infrastructure; with limited aflatoxin testing sites available.- RSB, AIF, MINIMEX
- **Production**: Food safety starts with production. Current farming practices, e.g., misuse of agro-chemicals or irrigation with waste-contaminated water, can expose fresh vegetables to high chemical and microbial contamination.
- **Low access to handwashing**: only 11.5% households having a place for handwashing making even food that was safely produced unsafe to consume.

Outcomes - Key lagging indicators
- **Increased burden of disease**: 75% population exposed to fecal contamination via drinking water. This is similar with foodborne diseases estimates in other African countries. 
- **Poor product quality**: Complementary food products (e.g., infant porridge) show inadequate nutrient contents and high aflatoxin and microbial contamination levels.

Implications and potential interventions
- The resulting high levels of food loss, food waste, and increasing the burden of disease (e.g., liver cancer associated with aflatoxins) have economic and health costs.
- Robust food safety systems will give food processors and food service incentives to purchase local produce instead of imports.
- Potential interventions include:
  - RSB, FDA and private sector increasing laboratory food testing capacity to complement resources at the national reference lab and match mandatory testing requirement
  - FDA Implementing and updating food safety improvement frameworks, with a focus on supporting informal markets through training, incentives and materials
  - Investing in training and support for farmers and microprocessors to acquire needed infrastructure to maintain quality and safety of food along distribution
  - Increasing investment in cold chain systems to improve shelf-life of perishable goods (see supra indicators 8, 12)
Action Track 2: Shift to sustainable consumption patterns
Cost of a healthy diet as a percent of average household food expenditure (%)

It is the cost of acquiring a healthy diet as a share of total household expenditure being spent on food.

% cost of a healthy diet to food expenditure

<table>
<thead>
<tr>
<th>Year</th>
<th>Rwanda</th>
<th>Africa</th>
<th>World</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>245%</td>
<td>167%</td>
<td>95%</td>
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</table>

Drivers - Key leading indicators
- Nutrient supply: Own production relies on land parcels that are too small to feed a household all year.
- Market Access: At least 1 main market per district; In some areas, access is a critical challenge (~86 min. to reach the nearest market in villages without market).
- Price volatility: 10% domestic food price volatility index. In lean seasons as own production declines & most food is market-sourced, households are exposed to seasonal food price increase.

Outcomes - Key lagging indicators
- Affordability: 89.6% of Rwandans cannot afford a healthy diet. Following the 2016-17 droughts, in 2018, ~67% households reported having lack of food or money to buy food (+17% compared to 2015).
- Diet quality: Due to high costs of nutritious foods, the bulk of households’ food expenditure is dedicated to cereals.
- Low Food Consumption Score: Households with poor or borderline consumption show almost no consumption of animal products, fruits, and sugar.

Summary
Trend: A healthy diet costs ~245% of average household food expenditure, while a nutrient adequate diet costs ~86% and energy sufficient diet costs ~30%. Predominant sources of food are markets (~70%) and own production (~30%).

Target: No national targets or global targets set. Desired score is 100% of population can afford a healthy diet.

Implications and potential interventions
- Daily and unskilled laborers and households relying on external support spend large fractions of their budgets to purchase filling food that is not nutritious.
- Potential interventions include:
  - During crises, e.g., COVID-19, leverage short-term price-lowering strategies e.g., price ceilings
  - Expand social protection services e.g., by setting a target for nutrition spend as a percentage of total spend
  - Subsidizing inputs for vegetables and fruits to raise production for domestic markets and exports
  - MININFRA, Private Sector investing in processing, storage and logistics infrastructure to reduce loss and extend shelf-life e.g., tomatoes whose prices spike in dry season
  - MINECOFIN, MOH exploring fiscal policy, including taxes and subsidies, to lower costs and improve access to healthy foods
  - MINALOC, MOH, MINAGRI mapping food flows across districts and internationally to strengthen linkages between producers and purchasers of nutritious foods

Price volatility of all crops (%)

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<td>30</td>
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</tbody>
</table>

Number of days in a week different food groups are consumed (2018)

- Acceptable FC
- Borderline FC
- Poor FC
Per capita GHG emissions of food consumption (kg CO2eq./person)

It is the total of emissions arising along the entire food value chain from agricultural production to the end consumer.

Drivers - Key leading indicators

- Local Sourcing: Short distance covered by consumed food; ~30% contribution of self-grown food to the diet; 72% of fruit & veg. never leave district of production
- Geography: Small land area lowers environmental impact of transport of food from rural to urban areas
- Consumption: Low consumption of animal products, which tend to have higher environment impact in terms of emissions processing, storage & transportation
- Demographics: Only 17% of Rwandans live in urban areas; as incomes & urbanization increase, diet preferences tend to shift towards animal products and imports grown from further away
- Food loss and waste: Relatively high levels of food loss and waste, which if lowered, could reduce GHG emissions further by an estimated 16%(see supra-indicator 8 and 10)

Outcomes - Key lagging indicators

- The outcomes of emissions are affected by interactions of local, regional and global factors
- Temperature has increased in Rwanda by 1.4°C since 1970, (higher than the global average), and is expected to rise by up to 2.5°C by the 2050s from 1970. This could raise incidence of heat-related illnesses, pests, diseases

Implications and potential interventions

- In 2015, agriculture (excluding forestry) contributed 55% of GHG emissions, followed by energy(31%), waste (12%) and industrial processes/products(2%)
- The targeted emissions reduction (which implies ~466-688 Kg CO2e per capita in 2030) is challenging to attain without tradeoffs on other goals e.g., fertilizer use, livestock production, processing
- Consumption choices are driven by many other considerations apart from environmental concern e.g., accessibility, affordability, tastes and socio-cultural norms
- Potential interventions include:
  - MINAGRI encouraging production of sustainable animal-based food alternatives as sources of protein
  - Min. Environment, MINAGRI fast-tracking site-specific fertilizer recommendations and blends
  - Min. Environment, MINALOC encouraging reduced food waste from retail sources e.g., through ‘sort from source’ campaigns in Kigali

Summary

Trend: Rwanda is substantially lower in emission of GHG by ~150% compared to African averages and by ~140% compared to world averages

Target: Attain total emission reduction of 4.6M tCO2e in 2030 compared to Business As Usual 12.1M tCO2e, ~62% reduction from the NDCs. Agriculture is expected to account for 49% of the reduction potential.
Food waste index

Food that completes the food supply chain up to a final product, of good quality and fit for consumption, but still doesn’t get consumed. It covers both edible and in-edible parts of food (e.g., peels, banana skins).

**Food Waste in Kg/Capita/year**

<table>
<thead>
<tr>
<th>2020</th>
<th>Rwanda (Kigali)</th>
<th>Household</th>
<th>Retail</th>
<th>Food services</th>
</tr>
</thead>
<tbody>
<tr>
<td>207.65</td>
<td>164</td>
<td>28</td>
<td>74</td>
<td></td>
</tr>
</tbody>
</table>

**Country target** | **Global target (2030)**

| N/A | Halve per capita global food waste (SDG 12.3)

**Drivers - Key leading indicators**

- Poor household planning: Urban areas tend to have spoilage due to improper storage, over buying, cooking or serving too much food
- Market infrastructure: Prevalence of traditional open-air markets, which lack cooling and storage infrastructure to extend produce shelf-life
- Purchase decisions: Customers abandon purchase of fruits & vegetables for reasons related to price (too expensive), availability (out of season), cleanliness and quality (not fresh)
- Subsistence: Less amount of food wastage in rural homes due to subsistence farming and high rates of consuming own production
- Food services: While penetration of restaurants is still low, drivers of waste include poor demand forecasting, overstocking, low product quality and customer behaviours e.g., serving too much

**Outcomes - Key lagging indicators**

- Environment costs: Rwanda combined losses and wastes are ~40% of annual food production. This loss is ~16% of its greenhouse gas emissions and represents 21% of land use (564,400 ha. of land)
- GDP: 12% loss to Rwanda’s annual GDP due to food waste and losses
- Waste management costs: Food waste is an urban and health management problem. 68% waste in landfill is organic matter

**Waste Composition in Kigali City**

<table>
<thead>
<tr>
<th>Waste Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Residue</td>
<td>68%</td>
</tr>
<tr>
<td>Plastics</td>
<td>5%</td>
</tr>
<tr>
<td>Textile</td>
<td>15%</td>
</tr>
<tr>
<td>Paper</td>
<td>9%</td>
</tr>
<tr>
<td>Metal</td>
<td>1%</td>
</tr>
<tr>
<td>Other</td>
<td>1%</td>
</tr>
</tbody>
</table>

**Implications and potential interventions**

- Food waste occurs at a smaller scale than food loss nationally
- Rwanda’s rapid urbanization rate of ~4.5% creates an urgency to reduce food waste and loss to ensure food security. Reducing food waste and loss can increase availability of domestic food for consumption and reduce pressure on the import bill
- Potential interventions include:
  - MININFRA, MINAGRI supporting investing to lower energy costs-including access to off-grid and renewable energy-efficient storage solutions for households
  - MINAGRI, MINICOM encouraging investing in processing, other infrastructure and food messaging on how to store and prepare produce to extend their shelf-life
  - MIN. Environment investing in robust data collection to guide prevention of food waste and alleviate pressure on waste management systems
  - Accelerating programs to valorize inedible parts of food waste (bone shells, etc.) and convert food waste into organic fertilizer to boost crop production via ‘sort from source’ campaigns in Kigali

**Summary**

- Trend: On a per capita basis, food waste is estimated to be ~71% higher in Kigali than the world average
- Target: No national targets available, however government programs e.g., Africa Center for Cooling Excellence suggest intent. It is necessary to measure food waste to track national progress and report on SDG 12.3

Click for Meta data: Sources
### Composite index combining food environment policies

**Food environment policies that encourage consumption of sustainable and healthy diets**

#### Drivers - Key leading indicators

- **Legislation**: Laws on mandatory fortification of key foods (maize flour, wheat flour, edible oil and fats, sugar and salt) passed right before COVID-19 and implementation affected by the pandemic. Processors face adoption constraints: high cost of equipment, costs of premix, limited demand and low consumer purchasing power.
- **Taxation**: Rwanda has 39% tax on all soft drinks, including sugar sweetened beverages and non-SSB.
- **Child feeding practices**: Legal provisions guiding the marketing of breastmilk substitutes exist, with monitoring mechanisms that need to be strengthened (e.g., prohibition of free/low-cost supplies to health workers).
- **Political will**: Commitment of resources (both monetary and talent) is catalyzed by evidence of a public health problems (e.g., stunting) and community advocacy from village to national level.

#### Outcomes - Key lagging indicators

- **Food safety systems index**: Rwanda has increased food systems safety over the past few years (See supra-indicator 5).
- **Malnutrition**: Unhealthy diets are the common denominator across all forms of malnutrition (see supra-indicators 1, 2, 3 and 4).
- **Food affordability**: A healthy diet costs 245% household expenditure (see supra indicator 4).

#### Summary

**Trend**: Policies and guidelines to support sustainable, healthy diets are partially available.

**Target**: No national targets or global targets set. Index developed in 2021 by FS-TIP.

---

### Food Environment Index

<table>
<thead>
<tr>
<th>2017</th>
<th>3</th>
<th>N/A</th>
<th>N/A</th>
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</thead>
</table>

#### Building indicator

- Marketing restrictions of junk and non-alcoholic beverage to kids
- Marketing of alternatives to breastmilk restrictions
- Tax on Sugar Sweetened Beverage (SSB)
- Low tax on fruits/vegetables
- Reduction of consumption of salt/sodium policies
- Limit saturated fatty acids or trans fatty polices
- Fortification legislation of key foods

#### Country target

<table>
<thead>
<tr>
<th>Global target (2025)</th>
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<tbody>
<tr>
<td>N/A</td>
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### Implications and potential interventions

- **Shift to sustainable consumption patterns**
- **Drivers**
- **Outcomes**
- **Implications and potential interventions**

---

### Select for Meta data: Sources
Action Track 3: *Boost nature-positive production*
Green house gas (GHG) emissions from agriculture

These are all emissions and removals occurring on ‘managed land’ and that are associated with the use of land for agriculture.

Total GHG emissions from agriculture (MtCO2e)¹

<table>
<thead>
<tr>
<th>Year</th>
<th>Rwanda</th>
<th>Africa</th>
<th>World</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>1.42</td>
<td>N/A</td>
<td>32.60</td>
</tr>
</tbody>
</table>

Drivers- Key leading indicators

- **Domestic livestock:** Enteric fermentation rose by 35% from 0.95 MtCO2e (2005) to 1.284 MtCO2e (2015) with increased livestock².
- **Farming practices:** N2O emissions from agricultural land fell by 73% to 0.73 MtCO2e (between 2005 and 2015). 56% of agriculture land was under sustainable land management practices in 2016.
- **Fertilizer utilization:** Inefficient use of subsidized fertilizer (application at wrong time, wrong types or incorrect quantities,) due to limited training among farmers.
- **Mechanization:** +16% annual growth in mechanized land tillage, which can increase profit and production, but breaks up the soil (a natural carbon sink) and releases carbon into the air².

Outcomes- Key lagging indicators

- **Contribution to GHG Emissions:** Agriculture’s direct contribution to overall emissions shrank from 78% in 2005 to 55% in 2015 as those from energy and waste expanded² (Indirect, but important contributions e.g., mechanization, were not listed under agriculture).

GHG Emission Sources in Rwanda²

- **Fertilizer emissions:** 17,607 Mg CO2e yr⁻¹ in 2017.
- **Temperature change:** Rwanda has experienced a 1.4 °C rise since 1970, higher than the global average² (see supra-indicator 7).
- **Adverse weather shocks:** Changes in rainfall patterns likely to affect producers dependent on rain-fed agriculture² (see supra-indicator 7).

Implications and potential interventions

Government-initiated programs e.g., Crop Intensification Program (CIP) and Girinka are examples that improve livelihoods while also driving emissions e.g., Girinka reduced food insufficiency by 11%, but increased GHG by 1174 kg CO2e/ hh/ yr. Impacts and trade-offs will need to be addressed across programs to ensure sustainable healthy dies for all.

Potential interventions include:

- MINAGRI, Min. Environment reducing enteric fermentation emissions through breed selection and investing in small stock.
- MINAGRI accelerating soil & crop-specific fertilizer blends, avail the right types in good time, with messaging on correct usage.
- MINAGRI enhance extension services to improve understanding and farmer skills in balancing chemical and organic fertilizer.
- MINAGRI, MINALOC strengthening soil conservation measures including terracing, conservation tillage, multi-cropping and crop rotation, leveraging evidence to train farmers & extension officers.

Summary

Trend: GHG emissions related to agriculture substantially lower than World average. The biggest sources of agriculture emissions are enteric fermentation(44%), manure (28%) and N2O from managed soils(25%).

Target: Agriculture sector accounts for 49% of the total reduction potential of 4.6 MtCO2e by 2030².

<table>
<thead>
<tr>
<th>GHG emission Sources</th>
<th>2005</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>18%</td>
<td>16%</td>
</tr>
<tr>
<td>Energy</td>
<td>78%</td>
<td>78%</td>
</tr>
<tr>
<td>Land Use, Change and Forest</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Industry Processes</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>
Average forest land being deforested for agriculture use over the past 3 years implies the long-term or permanent loss of forest cover by transformation into agricultural use.

<table>
<thead>
<tr>
<th>Country target (2024)</th>
<th>Global target</th>
</tr>
</thead>
<tbody>
<tr>
<td>30% forest cover</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Drivers - Key leading indicators:
- Population density and growth: Result in high pressure on small land holdings. Low productivity from constant cultivation increases need to clear more land.
- Land management: Misconceptions and practices e.g., vegetation burning before planting season are thought to raise soil fertility, but end up leading to forest fires.
- Extensive use of firewood: ~85% of households depend on firewood as the primary cooking fuel (95% in rural areas). Firewood and charcoal diversifies income.

Outcomes - Key lagging indicators:
- Environment: Biodiversity and habitat index: natural forest is disappearing rapidly.
- Erosion: Increased erosion risk from unsustainable agriculture on steep land without adequate soil conservation measures. Floods and landslides have become increasingly common.
- Global climate risk: Rwanda has high vulnerability (ranked 168 out of 182) & a medium change readiness score (ranked 92 out of 192) in 2019 (See supra-indicator 20).

Implications and potential interventions:
- Forests enable Rwanda’s tourism and protect watersheds and downstream wetlands and serve as water catchments areas.
- The government has spearheaded a 2019 countrywide campaign to boost the plantation of fruit trees (3/household) to improve fruit production, restore soil health, and mitigate climate change.

Other possible interventions include:
- MINAGRI improving productivity through better soil management practice of current farmland to reduce drivers of deforestation.
- Min. Environment, MINAGRI equipping farmers on conservation agriculture and agroforestry with opportunities to diversify income e.g., beekeeping.
- MINIFRA improving access to and lowering cost of electricity to provide alternative fuel source.
- MINAGR developing Soils Investment Hubs to bring together key stakeholders to drive aligned investments and mechanisms to scale healthy soil agriculture practices.
- MINALOC to mainstream, reinforce forestry activities at local level.

Summary:
Trend: Widespread deforestation with ~64% decline in natural forests (1960-2007) due to human activity, including the resettlement of refugees. The government has taken ambitious steps to reverse the impact of deforestation.

Target: Rwanda aims to increase forest cover to 30% of total land area by 2024.
Food loss along the supply chain

Refers to food that gets lost, or incurs reduction of quality during its process in the supply chain before it reaches its final product stage.

### Post-harvest, pre-retail food loss (%)

<table>
<thead>
<tr>
<th>2018</th>
<th>N/A</th>
<th>N/A</th>
<th>N/A</th>
</tr>
</thead>
</table>

#### Drivers - Key leading indicators

- **Distribution:** Fragmented, expensive transportation system. In 2017, 13.3K km rural feeder roads were in good or passable condition (45% of 30K km target).
- **Storage capacity:** Rural storage infrastructure is inadequate to meet the local production. The government has supported post-harvest infrastructure e.g., 369 maize drying shelters, 17 mobile dryers, 2 vegetable cold rooms. Farmers don't know how to optimize use.
- **Harvest techniques that bruise produce**
- **Post-harvest handling:** focused on almost-ripe fruits & vegetables, transported without preservation
- **Vulnerability to global pests** e.g., Fall Armyworm, which invaded maize in all 30 districts in 2017.
- **Data Gaps:** Historical data on storage, transport, market losses is not systematically captured, limits usability for decision making.

#### Ag. Infrastructure index (%)

<table>
<thead>
<tr>
<th>2019</th>
<th>Rwanda</th>
<th>Africa</th>
<th>World</th>
</tr>
</thead>
<tbody>
<tr>
<td>26%</td>
<td>53%</td>
<td>4%</td>
<td>9%</td>
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</tbody>
</table>

#### Outcomes - Key lagging indicators

- **Access:** The quality, shelf-life & value of produce is diminished; produce has a relatively short shelf-life, can't be transported long distance- only -28% fruits and vegetable leave district of origin.
- **Access:** High food loss lowers dietary diversity by discouraging the production of nutrient-rich perishable foods.
- **Emissions:** Food loss also puts an unnecessary burden on the environment. Resources are used and emissions occur to produce foods that never reach consumers.
- **Contamination:** Poor cereal storage and handling (including mixing of pest-infested batches with better batches), limited testing infrastructure resulting in aflatoxins in key foods, including processed foods.
- **Health risks:** Increased burden of disease e.g., liver cancer, associated with high levels of aflatoxins.

### Summary

**Trend:** Food loss is higher than world average for cereals, fruits and vegetables.

Food loss hotspots at production, post-harvest storage & wholesale & retail stages.

**Target:** Global targets to reduce post-harvest losses exist. Rwanda aims to reduce loss to <1% from 10.4%(maize), 27.4%(beans), 8.3%(rice) in 2014.

**Drivers:**
- Access: The quality, shelf-life & value of produce is diminished; produce has a relatively short shelf-life, can't be transported long distance-
- Storage capacity: Rural storage infrastructure is inadequate to meet the local production.
- Harvest techniques that bruise produce
- Post-harvest handling: focused on almost-ripe fruits & vegetables, transported without preservation
- Vulnerability to global pests e.g., Fall Armyworm, which invaded maize in all 30 districts in 2017.
- Data Gaps: Historical data on storage, transport, market losses is not systematically captured, limits usability for decision making.

**Outcomes:**
- Access: High food loss lowers dietary diversity by discouraging the production of nutrient-rich perishable foods.
- Emissions: Food loss also puts an unnecessary burden on the environment.
- Contamination: Poor cereal storage and handling (including mixing of pest-infested batches with better batches), limited testing infrastructure resulting in aflatoxins in key foods, including processed foods.
- Health risks: Increased burden of disease e.g., liver cancer, associated with high levels of aflatoxins.

**Implications and potential interventions:**

- High levels of food loss reduce the economic and livelihood benefit that Rwandans from increased agriculture productivity. The same practices that lead to food loss reduction are also effective at improving food safety.
- Loss reduction requires continued investments in infrastructure and innovative logistics models.

Possible interventions could include:
- MINAGRI exploring scale up of models that reduce farm-based post-harvest activities e.g., Kumwe cob model which buys unshelled maize from farmers for industrial drying and storage.
- MINAGRI introducing affordable on-farm storage & handling tech to cooperatives and training on early warning systems, monitoring & management of pests e.g., FAW.
- Min. Environment, MINAGRI supporting investing in proper assessment and disposal of fungus and aflatoxin affected crops e.g., as feed for soldier flies.
- MININFRA supporting transport infrastructure to link producers to markets, storage and processors.
Biodiversity and habitat index
Assesses countries’ actions toward retaining natural ecosystems and protecting the full range of biodiversity within their borders

Table

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Rwanda</td>
<td>47.30%</td>
<td>57.65%</td>
<td>54.50%</td>
<td>58.50%</td>
<td>60.65%</td>
</tr>
<tr>
<td>Africa</td>
<td>57.65%</td>
<td>67.85%</td>
<td>74.50%</td>
<td>78.65%</td>
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<tr>
<td>World</td>
<td>54.50%</td>
<td>64.75%</td>
<td>71.50%</td>
<td>75.65%</td>
<td>77.75%</td>
</tr>
</tbody>
</table>

Drivers-Key leading indicators

- **Protected areas**: Biodiversity is relatively well preserved in protected areas (~10% national territory) but highly threatened in unprotected ecosystems.
- **Population pressure**: Population growth on the scarce land has led to the reduction of protected areas and land degradation, resulting in high loss of habitats and biodiversity.
- **Deforestation**: Vegetation clearing for subsistence agriculture & fuel and conversion of natural forests into farming & grazing lands threaten habitats (see supra-indicator 11).
- **Limited forestry extension services** leading to poor survival of planted seedlings, low intensity management of forest plantations and low productivity.
- **Inputs**: Excessive use of pesticides which kills pollinators e.g., bees.

Outcomes-Key lagging indicators

- **Genetic Erosion**: Risk of genetic erosion in agro-biodiversity with the replacement of local animal and crop varieties with improved or exotic species.
- **Species Loss**: Rwanda hosts 30% of the global population of the endangered mountain gorilla and 2100+ species of plants. Without registering and preserving biodiversity, there is a risk of reduction in diversity of food and medicinal plants, and an overall less resilient food system.

Summary

**Trend**: Ranked 120 globally out of 180 countries. Rwanda’s ranking declined between 2005 and 2010 and has remained steady since then.
**Target**: No global or national targets available. Related targets include NBSAP (Target 11) which focuses on safeguarding genetic diversity of local breeds to minimize genetic erosion.

Implications and potential interventions

Rwanda’s aims to achieve an overall 30% sustained forest cover of the total national land surface by 2030. The next stage is to drive productivity of existing land and weaken the cause of biodiversity and habit loss.

Possible interventions include
- **Min. Environment, MINAGRI** articulating and socialization of biodiversity goals to reduce knowledge gaps.
- **MINAGRI** delivering healthier diets and restoring land through tree-based food production.
- **Min. Environment, MINAGRI and MINEMA** to scale up initiatives to restore/rehabilitate degraded ecosystems and promote indigenous species in agroforestry & landscape restoration in high-risk areas.
- Promote agro-systems at local level that utilize ecosystem-based approaches and maximize production on small land (e.g., Agroforestry).
- **Ecosystem Restoration**: The UN Decade on Ecosystem Restoration (2021) was launched to galvanize action to restore degraded ecosystems.

### Related targets for forest cover and biodiversity conservation

- SDG 15 on protection, and restoration of forest.

### Summary: Biodiversity and habitat index

<table>
<thead>
<tr>
<th>Year</th>
<th>Rwanda</th>
<th>Africa</th>
<th>World</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>47.30%</td>
<td>57.65%</td>
<td>54.50%</td>
</tr>
<tr>
<td>2005</td>
<td>47.30%</td>
<td>57.65%</td>
<td>54.50%</td>
</tr>
<tr>
<td>2010</td>
<td>47.30%</td>
<td>57.65%</td>
<td>54.50%</td>
</tr>
<tr>
<td>2015</td>
<td>47.30%</td>
<td>57.65%</td>
<td>54.50%</td>
</tr>
<tr>
<td>2020</td>
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<td>57.65%</td>
<td>54.50%</td>
</tr>
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### Outcomes

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Action Track 4: Advance equitable livelihoods
Gini index (specific) based on incomes across the food system
Highlight’s income distribution among various players in the food systems

**GINI Index (specific)**

<table>
<thead>
<tr>
<th>Year</th>
<th>National GINI Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>N/A</td>
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<tr>
<td>2021</td>
<td>N/A</td>
</tr>
<tr>
<td>2022</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Drivers—Key leading indicators**

- **Value add**: Low-productivity, low-value add agriculture is main income source for the majority. Agriculture daily laborers, unskilled laborers, and households living from external support or begging spend more than 50% of their budget to buy food.
- **Income distribution**: Disaggregated data shows income inequality varies within and across provinces. Income inequality is high in urban centers, especially Kigali, and lower in rural areas.
- **Employment**: Lack of income-generating opportunities outside farming in rural areas; focus has been on formal instead of semi-formal opportunities.
- **Credit**: Affordable credit can provide investible resources to raise income. Rural access to credit is low. Only 3% of females in rural areas secured a loan from a formal source compared to 6% of males.

**Outcomes—Key lagging indicators**

- **Poverty Rates**: Rwanda aims to reduce percent of population below poverty line from a baseline of 38% (2016) to 17% (2024).

**Population affected by types of poverty Between 2010/11 and 2013/14**

- Not poor in either year: 46%
- Chronically poor: 26%
- Transient poor: 27%

**Implications and potential interventions**

Rwanda aims to accelerate inclusive economic growth and development founded on the private sector, knowledge and natural resources. Rwanda has made overall progress with poverty reducing from ~59% (2000) to ~34% (2017).

Additional interventions to create decent and productive jobs include:
- **MINALOC, MINAGRI** and private sector offering more credit and insurance to protect smallholder farmers against shocks e.g., extreme weather and pests
- **RLMUA** increase proliferation of income models that retain land ownership e.g., rental/lease
- **MINICOM** creating a competitive business environment via electrification, infrastructure and training to increase private sector investment in value-added food processing, manufacture and distribution
- **Accelerate creating of jobs in other sectors**, allowing people to graduate from subsistence farming and reduce pressure on land
- **Expanding social protection focusing on the most vulnerable** to support livelihoods through income, inputs
Gap between farmgate price and wholesale price

Highlights the gap between farmgate price and wholesale price. Compares income to farmers vs. prices paid by wholesalers

Drivers - Key leading indicators

- **High route-to-market costs**: Difference in prices arise in part from high costs of aggregation and transport as each intermediary needs a sustainable cut
- **Infrastructure**: Quality of roads adds to the increase of retail prices as transportation of goods remains very costly
- **Financial inclusion**: Individual farmers have low bargaining power due to limited capacity to wait for payment and lack of access to credit
- **Incentives to sell**: Farmgate traders can offer immediate cash payment to farmers for multiple crops without holding up quality or packaging standards and free time for other obligations, so there are few incentives to incur costs to travel to market
- **High food Loss**: Before the products are retailed, an important part of it rots or spoils. (see supra - indicator 12) The level of waste is considered by retailers when setting the prices

Outcomes - Key lagging indicators

- **Income distribution**: Individual farmers attract low produce prices with women sellers receive lower prices than male sellers contributing to gender inequities
- **Food insecurity**: ~50% of the households in Ubudehe 1 and low-income farmers reported seasonal food access issues

Implications and potential interventions

Farmers are exposed to price volatility and dominate the lowest wealth quintile, and thus the role is becoming less attractive to young people who seek better paying and more professional jobs

Trade off includes increasing costs of food since prices increases will likely be passed to consumer. There is need to modelling the impact on prices as well as the effect of farmer incomes

Potential interventions could include

- MININFRA, MINAGRI creating an environment for private-sector to professionalize the quality and relevance of services (production, processing, distribution, promotion and market access) for farmer organizations with limited capacity to systematically market aggregated commodities or negotiate for better prices
- MINAGRI promoting fair prices and fair wages to secure sustainable livelihoods for agricultural workers and small-scale farmers
- MINAGRI, MININFRA and MINICOM to facilitate intra-district trade of meat, fish, eggs, fruits and vegetable via investment in infrastructure

Summary

Trend: Substantial differences in prices between farmgate, district market and Kigali market prices with prices in Kigali multiple times higher than farmgate

Target: PSTA-4 includes a related target on reduction rate of the gap between wholesale and farmgate price, however no numeric targets included
Women empowerment in agriculture index

Shows the degree to which women are empowered in their households and communities and the degree of inequality between genders

<table>
<thead>
<tr>
<th>Women Empowerment in Agriculture Index</th>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>0.906</td>
<td>N/A</td>
</tr>
<tr>
<td>2020</td>
<td>0.924</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Drivers - Key leading indicators

- Land: Women-managed farms are ~10% smaller; smaller land sizes and lack of control over land resources, limit women’s access to selected seeds and fertilizers.
- Decision-making: Women have limited decision-making control over resources in households, cooperatives and planning bodies, especially in rural areas.
- Dependency ratio: Women-managed farms have a higher dependency ratio.
- Lower financial inclusion: In rural areas, ~20% women have bank account compared to ~33% men, with women’s accounts more likely to be in SACCOs, while men bank with commercial banks.
- Credit: Rural access to credit is low but still biased against females. Only 3% of females in rural areas secured a loan from a formal source compared to 33% men, with women’s accounts more likely to be in SACCOs, while men bank with commercial banks.
- Gender Norms: Women are relegated to low paying and subsistence farming while men dominate higher paying areas.

Outcomes - Key lagging indicators

- Productivity: Women-managed farms have ~12% less productivity; Female farm managers spend 35% less on fertilizers & insecticides.
- Participation: Fewer women access off-farm jobs and participate in lucrative parts of agricultural value chains.
- Income: Lower prices for agri-produce (compared to prices achieved by men).
- Lower benefit from government guarantee schemes: Rural Investment Facility Phase 1 and 2 had only 8-9% women beneficiaries.

Implications and potential interventions

Inclusion of women and youth is a cross-cutting priority for all and backed by high levels of political will and progressive laws that give women same succession rights and equal land access. Agriculture accounts for ~80% of the female labor force, mostly subsistence farmers. Empowerment has the potential to increase GDP by ~USD 418 million and reduce poverty.

To further accelerate these potential gains, there is need to strengthen the capacity across institutions to mainstream gender-responsive in all programing by:

- All: Ensuring adequate and inclusive budget levels for mainstreaming gender in policies and institutions
- All: Developing gender-responsive accountability mechanisms, e.g., imihigo, public hearings to drive ownership, especially around participation in agri-value chains

MINAGRI, MIGEPROF, MINALOC, MYCULTURE to accelerate profitable participation of women and youth in short-cycle value chains e.g., fruits, vegetables by providing mechanisms to enable women farmers to access extension, inputs and technologies.

Summary

<table>
<thead>
<tr>
<th>Country target</th>
<th>Global target</th>
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<tbody>
<tr>
<td>N/A</td>
<td>N/A</td>
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</table>

Trend: Rwanda has taken proactive steps resulting in high levels of inclusion of women in public and governance spheres. Since 2014, the WEAI has improved by 0.3%, however there is need to drive empowerment of women, especially in rural areas.

Target: No national or global targets available for this indicator.
Action Track 5: Build resilience to vulnerabilities, shocks and stress
Household resilience capacity index
Estimates household resilience to food insecurity with a quantitative approach

Drivers - Key leading indicators
- Livelihood Shocks: In 2018, 40% of households, compared to 27% in 2015, reported having at least one shock during the last 12 months that affected its ability to provide food for itself or eat in a manner it is accustomed to or impacted household ownership.
- Low insurance penetration: In 2020, uptake of agriculture insurance was less than 0.5%.
- Cash-purchase dependency: The majority (~65-70%) of food eaten in Rwandan households comes from cash purchases in markets, making households vulnerable to changes in food price inflation.
- Climate Variability: Drought, intense and erratic rainfall, increasing incidence of high winds and seasonal temperature shifts affect agriculture, which is a main source of livelihood.
- Production inputs: Food insecure households in agriculture typically have less livestock, land and grow fewer crops. They are likely to have lower food stocks and consume more of their own production at home.

Outcomes - Key lagging indicators
- Income instability: 84% of households impacted by the 2016-2017 drought observed a decrease or a loss of assets or belongings, reducing their capacity to recover and accumulate wealth over time.
- Malnutrition and food security: ~19% households in Rwanda remain food insecure. Malnutrition is strongly related to incomes with malnutrition rates in the poorest quintile standing at ~49%.

Implications and potential interventions
If not addressed, climate variability will impose significant economic costs ($50M-$300M USD) annually by 2030 given the country’s dependence on rainfed agriculture.
Potential interventions include:
- MINALOC developing shock-responsive/sensitive social protection system to adequately respond to potential shocks (i.e., early warning, contingency plans, financing, etc.).
- MINAGRI, MININFRA promoting intra-country trade of grains, meat, eggs, fruits and vegetable and investing in storage, especially at selling points, and transportation facilities.
- Establish a strong partnership between MINAGRI and MINALOC to ensure a coordinated approach when targeting agricultural asset transfer schemes and agricultural extension services to poor and vulnerable population groups.
- MINAGRI strengthening strategic food reserves in regions where food insecurity is linked to climate change to ensure access to and affordability.
- MINAGRI and Min. Environment to improve access to drought-tolerant, pest-resistant seeds in vulnerable agro-ecological zones.
Proportion of men and women engaged in agriculture with access to financial services

Access of micro and macro credit by people involved in the agriculture sector

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**Accessibility:** MFIs are the most accessible, available in every district working with cooperatives, while formal banks are introducing mobile banking with micro services. Relatives and tontines were the most preferred source.

**Sources of credit:** Women borrow at lower rates from commercial banks, 2.2% vs 7.1% for men, and more from informal sources e.g., relatives(57%), tontines(41%) and informal lenders (14%).

**Productivity inputs:** Women have lower access to water, improved seeds, fertilizers, pesticides and agricultural tools due to Lack of collateral ownership, control over decision making which limit ability to register for financial services that require documentation.

**Low gendered benefit from government schemes:** Of loans provided under the Women Guarantee Fund (WGF) only 12% were utilized in the agriculture sector by March 2010 compared to 63% in commerce, even though most women work in the agricultural sector.

**High Costs-to-Operate:** Low uptake numbers, combine with production, market and climate risks to make it expensive to serve farmers.

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**Implications and potential interventions:**

- There is need to improve access to credit both men and women in the agriculture and to improve uptake. Without access to financial services, women and youth will continue to participate mainly in the less lucrative parts of the value chain that require little capital/credit to engage in.

Addressing demand-side barriers e.g., low levels of financial literacy and limited access to information, needs to happen at the same time as supply-side barriers are addressed e.g., ensuring financial products and services are available and tailored to the population.

Potential interventions include:
- **MINAGRI, MYCULTURE** developing business services, concessional loans, grants to locally owned gender and youth-sensitive incubation value-chain projects.
- **MINECOFIN** strengthening the reinsurance market to transfer risks.
- Private sector participation in extension for farmer sensitization on insurance.
- Digitalization to lower costs of sales, claims payment time.

---

**Trend:** Men and women in Rwanda have lower access to credit than across the continent of Africa. Agriculture in Rwanda presents important production and market risks that discourage banks, MFIs and SACCOs.

**Target:** In the NST-1, the goal is to double credit to the agriculture sector as a percent of loans from 5.2% in 2017 to 10.4% in 2024.

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**Summary**

- **Borrowing Reasons:** Household items leads in borrowing reason (24%), while agriculture and equipment and inputs was (13%) and livestock purchase(4%).

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<table>
<thead>
<tr>
<th>Proportion of men and women in agriculture with access to credit</th>
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<tbody>
<tr>
<td>2018</td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>Men</td>
</tr>
<tr>
<td>Women</td>
</tr>
<tr>
<td>N/A</td>
</tr>
</tbody>
</table>

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**Drivers - Key leading indicators**

- **Accessibility:** MFIs are the most accessible, available in every district working with cooperatives, while formal banks are introducing mobile banking with micro services. Relatives and tontines were the most preferred source.

---

**Outcomes - Key lagging indicators**

- **Uptake of credit:** Rural access to credit is low. Only 3% of females in rural areas secured a loan from a formal source compared to 6% of males.

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- Digitalization to lower costs of sales, claims payment time.
Government social security budget as a % of total requirements to cover vulnerable social groups

Drivers- Key leading indicators

- **Government commitment**: The Social Protection Policy (2020) is to ensure that all extreme poor and vulnerable groups are cushioned against vulnerability and shocks. They are, protected and guaranteed transformational interventions towards sustainable graduation.
- **Livelihood Shocks**: ~40% of households affected by shocks (e.g., drought, floods, landslides), with nearly 20% of people who were not poor in 2010/11 finding themselves poor in 2013/14.
- **Budget and GDP**: Social protection spending represented 6.1% of the national budget and 2% of GDP in 2020/21 compared to 4.1% of and 1.2% respectively in 2016/17.
- **Nutrition spend share**: The share of social protection spent on nutrition reduced over the past three years from 11% in 2018/19 to 10% in 2020/2021.
- **Access to nutrition support**: ~78% of food insecure households covered by the three lowest Ubudehe categories, yet only ~31% of households with unacceptable food consumption and ~25% of households with a malnourished child receive social assistance.
- **Responsiveness**: Social protection was expanded to assist vulnerable households impacted by Covid-19.

Outcomes- Key lagging indicators

- **Coverage**: Despite significant scale up of direct income support schemes (DIS), coverage is low compared to need, only ~50% households in Ubudehe1 (former scheme) covered by DIS.
- **Nutrition spend share**: The share of social protection spent on nutrition reduced over the past three years from 11% in 2018/19 to 10% in 2020/2021.

Implications and potential interventions

Rwanda’s commitment to social protection stems from a need to deliver rapid and inclusive socioeconomic development and guarantee security and stability countrywide.

In October 2020, the government launched new Ubudehe groups (A-E) to improve distribution of support to the most vulnerable to ensure the most vulnerable receive the greatest benefit from social protection spending.

Potential interventions could include:

- MINALOC to expand Public Works programs to regions that require market and storage infrastructure, or with transportation access challenges and areas that have been affected by climate changes.
- NCDA augmenting existing programs to provide essential nutrition-related training services to vulnerable groups.
- MINALOC making social security systems more adaptive to crises and with defined graduation mechanisms and appropriate levels of post-graduation support e.g., linking graduated beneficiaries to other programs and opportunities.

Summary

**Trend**: Government spend on social protection grew from RWF 73B (2014/15) to 198B in 2020/21, a 150% increase in five years.

**Target**: Rwanda aims to eradicate extreme poverty by 2024 and reduce percent of population below poverty line from a baseline of 38%(2016) to 17%(2024).
ND-GAIN (Notre Dame Global Adaptation Initiative) Country Index
Summarizes a country’s climate change vulnerability and its readiness to improve resilience

Drivers - Key leading indicators
- Land Deforestation and Reforestation: Widespread deforestation with ~64% decline in natural forests (1960-2007) due to human activity.4 The government has taken ambitious steps to reverse the impact4 aims to increase forest cover to 30% of total land area by 2024. (See supra-indicator 11)
- Vulnerability to Extreme Weather: Because of its geography and climatic profile, Rwanda is prone to various hazards but especially localized floods and landslides. Most affected districts include Bubanza, Rubavu, Gicumbi, Nyabihu, Ngororero, Musanze, Rutsiro, Nyamagabe, Muhanga, Kamonyi and Bugeza.5
- Governance: Rwanda’s Nationally Determined Contributions (NDCs) lay out commitments to attain total emission reduction of 4.6 M tCO2e in 2030 compared to Business As Usual. 12.1 M tCO2e and highlight measures that different major contributors can take to achieve the intended outcomes of emissions reductions (see supra-indicator 7).

Outcomes - Key lagging indicators
- Emissions: Since 2010, total GHG emissions from agriculture have reduced from 78% to 55% with investment in small stock, even as emissions from waste and energy continue to rise.6,7 (See supra-indicator 7 and 10).
- Climate change: Increasing uncertainty about rainfall events; most models predict higher rainfall intensity, and possible changes in rain patterns leading to shifts in timing of agricultural seasons that depend on rain-fed water systems (See supra-indicator 7 and 10).
- Household Resilience Capacity Index: Livelihood shocks from frequent incidence of adverse weather and climate change could increase reliance on crisis and emergency coping strategies (e.g., consuming seed stock) to counter food shortage8,9 (See supra-indicator 3 and 17).

Implications and potential interventions
Climate variability could impose significant economic costs estimated at $50-300 Million annually by 2030.11 Agricultural intensification needs to be implemented with strategies to reduce climate change vulnerability and build adaptive capacity in food systems.

Potential interventions could focus on:
- MINAGRI, Min. Environment to jointly track indicators, share data on climate resilience
- MINAGRI, Min. Environment to restore degraded systems for sustainable food production
- Min. Environment and MINEMA to develop early warning systems, to improve forecasting, monitoring and assessment of risk vulnerability and share timely information
- Min. Environment to explore private sector-led forest protection models
- MINAGRI, insurance players to integrate with extension, give timely payments for crop loss
- MINAGRI, Min. of Environment to encourage private capital in financing environmental adaptation strategies e.g., focus on insurance where it’s cheaper to invest ahead of disaster instead of fixing after, and irrigation strategies

Summary
Trend: Rwanda has high vulnerability (ranked 168 out of 182) & a medium change readiness score (ranked 92 out of 192) in 2019. Target: Regional target is at least 30% of African farm, pastoral, and fisher households are resilient to climate and weather-related risks. No national targets available
% production from top 5 crops
The proportion of production (by weight) occupied by the key foods produced in the country

Drivers - Key leading indicators

- **National policies**: The CIP (Crop Intensification Program) has been in place since 2007, specifies production of one priority crop in a region depending on soil type and weather conditions. CIP has also shaped farmers’ decisions via subsidies for inputs, and possibly their consumption patterns.

- **Government support**: To ensure yield of prioritized crops, land use policy has increased arable lands for CIP crops to promote direct consumption and food market sales. Government investment in small-scale irrigation, land husbandry, and mechanization drives crop production.

- **Production inputs**: Costs of farm inputs, crop marketability and profitability influence the farmers’ willingness to produce; if cost of one or more of farm inputs rises for a given crop, it lowers perceived profitability, and farmers may substitute that crop out.

- **Market availability**: Crops with an available, accessible market are more likely to be adopted by farmers.

Outcomes - Key lagging indicators

- **Increased food production**: Crop Intensification led to production increase for some crops such as climbing beans, played an important role in addressing food security & reduce malnutrition among children. Population pressure and limited land resources, these prioritized crops provide a food security buffer.

- **Diets**: Production and consumption linked as ~30% of food eaten comes from own production. Carbohydrates main source of energy (50% calories from potato, rice, banana & cassava) (See supra-indicator 4).

- **Dietary patterns**: Rwanda has the highest bean consumption in the world. Bean consumption per capita rose from 29kg in 2014 to 38.4 kg in 2018. In an avg. Rwandan diet, beans provide 32% of calorie intake and as high as 65% of protein intake.

Implications and potential interventions

- The subsidized input prices and the facilitation of supplying inputs by the government of Rwanda have eased the access to inputs by farmers in the country, especially for CIP priority crops.

- While land tenure reforms have increased food production for priority crops, there is still a challenge in accessing adequate nutritious foods which affects diet and health outcomes. (See supra indicator 1, 2 and 3)

- Potential interventions include:
  - MINAGRI strengthening agriculture extension services by proximity service providers, even private sector platers
  - MINAGRI, MININFRA training and building the capacity of farmers in agricultural production, post-harvest operations, and value chain development
  - Increasing infrastructure support for production and processing of more diverse, nutrient rich foods e.g., fruits, vegetables, bio-fortified crops.

Country target | Global target
---|---
Related target | Related target

Summary

Trend: No historical trend data. The top five crops mostly consumed in Rwanda are: beans, maize, potatoes, sweet potato and banana

Target: Global target is 70% of the genetic diversity of crops conserved. Related targets include NBSAP (Target 11) which focuses on safeguarding genetic diversity of local breeds to minimize genetic erosion.

<table>
<thead>
<tr>
<th>Year</th>
<th>Maize</th>
<th>Beans, dry</th>
<th>Plantains and others</th>
<th>Potatoes</th>
<th>Cassava</th>
<th>Sweet potatoes</th>
<th>Bananas</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>421,218</td>
<td>118,888</td>
<td>484,251</td>
<td>820,917</td>
<td>973,408</td>
<td>1,181,825</td>
<td>1,247,584</td>
</tr>
</tbody>
</table>

YOY Growth rate of beans

Action Track 1 | Action Track 2 | Action Track 3 | Action Track 4 | Action Track 5
---|---|---|---|---
Build resilience to vulnerabilities, shocks and stress

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Click to return to OVERVIEW
Cross cutting
Presence of food systems related governance bodies and mechanisms

Governance that encourages food systems transformation

### Food Systems Governance Index (0-16)

<table>
<thead>
<tr>
<th>2020</th>
<th>7/16</th>
<th>N/A</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building indicator</td>
<td>Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>On Track with CAADP process</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum 10% of public expenditure is on agriculture</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Explicit long-term goals on FS transformation</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Determined framework to look at food systems transformation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supra-ministerial body for food systems transformation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highest level government support for food system transformation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dedicated resources with required capability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formalized process to include stakeholders</td>
<td></td>
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</tr>
</tbody>
</table>

### Drivers - Key leading indicators

- **Legislation:** Laws on mandatory fortification of key foods (maize flour, wheat flour, edible oil and fats, sugar and salt) passed right before COVID-19. Processors face adoption constraints: high cost of equipment, costs of premix, limited demand and low consumer purchasing power.
- **Taxation:** Rwanda has 39% tax on all soft drinks, including sugar sweetened beverages and non-SSB.
- **Child feeding practices:** Legal provisions guiding the marketing of breastmilk substitutes exist, with monitoring mechanisms that need to be strengthened (e.g., prohibition of free/low-cost supplies to health workers).
- **Political will:** Commitment of resources (both monetary and talent) is catalyzed by evidence of public health problems (e.g., stunting) and community advocacy from village to national level.

### Outcomes - Key lagging indicators

- **Food safety systems index:** Rwanda has increased food systems safety over the past few years. Rwanda is outperforming Africa by ~10pp on food safety systems (see supra-indicator 5).
- **Malnutrition:** Unhealthy diets are the common denominator across all forms of malnutrition (see supra-indicators 1, 2, 3 and 4).
- **Food affordability:** A healthy diet costs 245% household expenditure (see supra indicator 6).
- **NCD mortality rate (100,000 inhabitants):** 44% of deaths in 2016 were attributed to NCDs (see supra-indicator 4).

### Summary

**Trend:** Policies and guidelines to support sustainable, healthy diets are partially available.

**Target:** No national targets or global targets set. Index developed in 2021 by FS-TIP.

### Implications and potential interventions

- **Food environment is not governed in a way to strongly encourage consumption of healthy foods and discourage consumption of non-healthy foods. Need to prioritize and subsidize desired health outcomes e.g., lower NCDs burden.**
- **Potential interventions include:**
  - RRA reducing taxes on healthy foods to encourage healthy food choices where possible.
  - MINICOM, FDA providing equipment financing to processors to address financial challenges in cost of production to enable processors to meet the standards.
  - FDA, NCDA developing consumer guidance mechanisms (Food-based dietary guidelines, Front-of-pack labeling with relevant, readily understood front of pack nutrition labeling to help make informed choices).
  - Restricting the promotion of unhealthy foods to children.
  - Continue inclusive stakeholder participation e.g., national food system dialogues.

### Action Track 1

- Build resilience to vulnerabilities, shocks and stress.
- Number of processing companies with fortification potential (Aug. 2020):
  - 7 No. of certified processors
  - 7 waiting to get certified
  - 636 Marked with areas to improve

**Drivers - Key leading indicators**

- Legislation: Laws on mandatory fortification of key foods (maize flour, wheat flour, edible oil and fats, sugar and salt) passed right before COVID-19. Processors face adoption constraints: high cost of equipment, costs of premix, limited demand and low consumer purchasing power.

**Outcomes - Key lagging indicators**

- Food safety systems index: Rwanda has increased food systems safety over the past few years. Rwanda is outperforming Africa by ~10pp on food safety systems (see supra-indicator 5).

---

1. Click for Meta data: Sources
2. Click to return to OVERVIEW

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Executive Summary
Approach and key insights from Diagnostic and Landscaping Analysis
Detailed Diagnostic Analysis

» Detailed Policy and Stakeholder Landscaping
Next Steps: from Diagnostic to Action
Appendix
The Policy and stakeholder landscaping focuses on the most important strategies, potential opportunities, trade-offs and implications.

What is covered in this policy and stakeholder landscape:

- Most relevant declarations, policies & strategies and stakeholders related to food systems
- Most important gaps and trade-offs in policies based on qualitative diagnostic
- Most important stakeholders related to food systems

What is not covered in this policy and stakeholder landscape:

- An exhaustive analysis of all policy, strategy and stakeholders’ documents
- Exhaustive analysis of all challenges and gaps in food systems policies
- All key stakeholders across the food system
Policy mapping conducted using framework sub-components...

**External drivers** - Environment & Climate, minerals, water, bio-diversity, land and soils; globalization and trade; income growth and distribution; urbanization, demographic shift; leadership and governance; socio-cultural context; finance; energy; science technology and innovation

**Food supply chains** - Input supply, food production systems, storage and distribution, processing and packaging and retail and marketing

**Food environment** - Food availability, food affordability, food messaging, consumer characteristics

**Consumer behaviour** - food acquisition, preparation, meal practices and storage

**Cross-cutting themes** - Gender, youth, human rights

**Outcomes**
- Nutrition, diet and health
- Livelihoods
- Environment

... which is assessed by corresponding component coverage

- Sub-component adequately covered and as expected
- Sub-component only partially addressed
- Substantial part of sub-component not addressed
Policy mapping
Hierarchy of policies in Rwanda

Rwanda Vision 2050 outlines the long-term strategic direction for Rwanda and enabling pathways to achieve this ambition. Its acts and the planning and policy blueprint for all players. Agriculture for wealth creation is one of 5 key pillars.

To ensure harmonization of targets and indicators, preparation of Vision 2050 considered the SDGs, AU’s Agenda 2063 and East African Community Vision 2050 and national contribution to the Paris accord.

Vision 2050 is implemented through 7-year mid-term strategies starting with National Strategy for Transformation 1 (NST1 2017-2024)

This feeds into Sector Strategic Plans (15 sectors) and national policies (each ministry), covering specific areas e.g., PSTA 4, NAP: District Development plans are implementation plans for districts, include all sectors and tailor for district specificities.

PSTA 4 is the implementation plan for NAP however accounts for elements in other policies e.g., National health policy. Policy implementation is decentralized at the district level, through annual plans and targets.

Selection of most relevant declarations

Institutional Strategic Plans (ISPs) 2019-2024 (e.g., NAEB 5-yr plan)

District Development Strategies (DDS) 2018-2024 (e.g., DDS Nyanza)

Key

Informative

Instructive/enforced

1. PSTA 4 - Agriculture Sector transformation Strategy 2. NAP - National Agriculture Policy 3. HSSP 4 - Health Sector Strategic Policy
Global and regional declarations touch upon many parts of the food system, but three main gaps exist.

<table>
<thead>
<tr>
<th>Global</th>
<th>Continental/Regional</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDG1 Agenda 2030</td>
<td>Malabo decln. and CAADP</td>
</tr>
<tr>
<td>COP2 21 - Paris agreement</td>
<td>Africa Nutrition Strategy</td>
</tr>
<tr>
<td>WHO3 agreements</td>
<td>AfCFTA5</td>
</tr>
<tr>
<td>WTO4 agreements</td>
<td>EAC6 Vision 2050</td>
</tr>
</tbody>
</table>

- Informal food system not addressed9
- Declarations do not address influence of consumer behavior on food systems
- Leveraging innovation, science and technology in food systems generally not addressed

- Component adequately covered
- Elements of component partially/not covered
- Component missing; expected to be addressed by declaration

National strategies touch upon most elements, though parts of the food supply chain and environment remain unaddressed

<table>
<thead>
<tr>
<th>Cross-sectoral national</th>
<th>Food supply chain</th>
<th>Food environment</th>
<th>Consumer behaviour</th>
<th>Nutrition, diet and health</th>
<th>Environment</th>
<th>Livelihoods</th>
<th>External factors</th>
<th>Cross-cutting themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vision 2050</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>National Trans. Strategy 1</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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</tr>
<tr>
<td>Agriculture transf. (MINAGRI)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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<td>✔</td>
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<tr>
<td>Health (MOH)</td>
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<td>✔</td>
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<tr>
<td>Financial (MINECOFIN)</td>
<td>✔</td>
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<td>✔</td>
<td>✔</td>
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<td>✔</td>
</tr>
<tr>
<td>Private sec. dev. and youth employment</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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<td>✔</td>
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<tr>
<td>Energy (MININFRA)</td>
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<td>✔</td>
<td>✔</td>
<td>✔</td>
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</tr>
<tr>
<td>Env. and natural resources (MOE)</td>
<td>✔</td>
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<tr>
<td>Social protection (MINALOC)</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>ICT (MINICT)</td>
<td>✔</td>
<td>✔</td>
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<td>✔</td>
<td>✔</td>
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<td>✔</td>
</tr>
<tr>
<td>Transport (MININFRA)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

1. Elements around retail and marketing, distribution not clearly addressed
2. Achieving higher food affordability of diverse and nutrient rich foods not clearly addressed
3. Policies do not address consumers’ behavior on FS, particularly consumer demand
### Potential changes required in national policies and strategies when implementing potential game changing solutions (I/II)

<table>
<thead>
<tr>
<th>Diet quality and nutrition security</th>
<th>Livelihood equity</th>
<th>Environmental resilience</th>
<th>Agricultural productivity</th>
<th>Infrastructure capacity</th>
<th>Financing and Investment</th>
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<tr>
<td>~20% Rwandans are food insecure with low consumption of healthy foods</td>
<td>~38% live below poverty line (2016), female-headed households worse off; leads to consumption of cheaper less nutritious meals</td>
<td>Increasingly-frequent climate shocks, challenges from crop disease and pests affecting food availability</td>
<td>Agricultural production is ~40-50% below potential due to inefficient production systems</td>
<td>Weak infrastructure from farm to fork and limited private sector investment leading to high food loss and lower food quality</td>
<td>Too little financing directed to food production and processing, limiting value chain growth and resilience</td>
</tr>
</tbody>
</table>

#### Agriculture
- Tailor input subsidies to increase healthy food production e.g., for animal feed, horticultural inputs
- Invest in agric. Commercialization and extension services with private sector
- Invest in micro-irrigation & lower cost electricity to increase uptake
- Accelerate soil and crop-specific fertilizer blends with farmer and extension officer trainings on both chemical and organic fertilizer
- Invest in storage and cold chain operations with skilled managers along key food market routes and accumulation points to reduce loss and facilitate local trade

#### Finance
- Partner with actors to de-risk producers, processors
- Subsidize production and cost of nutritious foods & tax unhealthy foods
- Specify the role and need for ICT and planning tools to fill gaps in data management, sharing and integration along value chains

#### Trade and Industry
- Strengthen market linkages including cold chain
- Promote nutrition sensitive trade
- Extend credit and insurance including de-risking particularly for small holder farmers and women
- Articulate further how food production can be better linked with markets (district, national and global)
- Accelerate development of forecasting and early warning systems

#### Governance
- Track joint indicators and share data on climate vulnerability across ministries
- Develop early warning systems

#### Technology
- Specify the role and need for ICT and planning tools to fill gaps in data management, sharing and integration along value chains
## Potential changes required in national policies and strategies when implementing potential game changing solutions (II/II)

<table>
<thead>
<tr>
<th>Diet quality and nutrition security</th>
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</tbody>
</table>

### Health
- Promote consumption of animal proteins from owned-sources and nutrition-sensitive role models

### Social protection
- Distinguish between farmers best supported to commercialize and those needing continued social protection programs

### Land and natural resources
- Increase awareness of importance of forests & train farmers on conservation agriculture
- Engage private forest protectors

### Land use
- Strengthen use of the land rental/lease models to reduce fragmentation while maintaining ownership among smallholders

### Finance
- Increase PPPs to invest in infrastructural development
- Incentivize credit extension for ag. infrastructure to reduce food loss

### Trade vs. Agric./Health
- Increased local availability, consumption of nutrient rich foods vs. export income; ASF consumption increases GHG

### Agric. vs. Finance
- Increase in incomes can raise labor costs and overall cost of production, making food more costly

### Land/Finance vs. Agric.
- Cultivating hillsides, marshlands can increase production, but raises costs to protect ecosystems and limit erosion

### Agric. vs. Finance
- Increasing irrigation could reduce hydropower capacity
- Conservation and eco-friendly farming could impact production

### Finance vs recurring costs
- Increased risk now from uncertain investments in infrastructure can reduce long-term recurring costs e.g., social protection

### Finance Distribution
- Prioritizing de-risking for large private entities vs de-risking for smallholder farmers

### Key Policy Change to make
- Health
- Social protection
- Land and natural resources
- Land use
- Finance
- Trade vs. Agric./Health
- Agric. vs. Finance
- Land/Finance vs. Agric.
- Agric. vs. Finance
- Finance vs recurring costs
- Finance Distribution
### Key challenges in FS

#### Diet quality and Nutrition
- Security & diversity: Limited production diversity to meet population's nutritional needs
  - **Potential Implications**: There is a strong focus on food security (as opposed to nutritional security) via selection of main crops. Livestock intensification efforts need to produce affordable foods to improve diet diversity. In addition, agricultural trade is incentivizes exporting high value nutrient rich foods.
  - **Potential opportunities**: Inter-ministerial collaborations have made great progress in reducing malnutrition (stunting).
  - **Current policies related to challenge (non-exhaustive)**: PSTA 4: Crop intensification focuses on select crops based on comparative advantage resulting in monocropping; kitchen gardens promote household diet diversity.
  - **Potential policy opportunities**: Continue scaling-up of agroforestry and fruit-tree programs.
  - **Identify opportunities to maintain crop productivity without direct government support**
  - **Proper application of inputs by farmers as well as ensuring their timely availability not addressed**
  - **Counter-measures against climate impacts need acceleration**
  - **Productivity improvements futile if supply chain infrastructure not developed hand in hand**

#### Agricultural productivity
- Production levels and yield low, with production methods that might harm long-term sustainability
  - **Potential Implications**: There is a strong focus on food security (as opposed to nutritional security) via selection of main crops. Livestock intensification efforts need to produce affordable foods to improve diet diversity.
  - **Current policies related to challenge (non-exhaustive)**: PSTA 4: Focuses more on provision of subsidized inputs (e.g., fertilizer), rather than proper application.
  - **Potential policy opportunities**: Continue scaling-up of agroforestry and fruit-tree programs.
  - **Identify opportunities to maintain crop productivity without direct government support**
  - **Proper application of inputs by farmers as well as ensuring their timely availability not addressed**
  - **Agricultural research focuses more on conventional farming processes**
  - **Counter-measures against climate impacts need acceleration**
  - **Productivity improvements futile if supply chain infrastructure not developed hand in hand**

---

1. Farming using pesticides and synthetic fertilizer, however not considering the use of biotechnology and other innovative technology applications.
Linking potential gaps, policies and opportunities to the key challenges of Rwanda's food system yields several issues and opportunities (II/III)

<table>
<thead>
<tr>
<th>Key challenges in FS</th>
<th>Current policies related to challenge (non-exhaustive)</th>
<th>Potential policy opportunities</th>
<th>Potential Implications</th>
</tr>
</thead>
</table>
| Infrastructure capacity | Under-developed supply chain infrastructure with limited private sector investment | • PSTA4 encourages the private sector to develop infrastructure e.g., drying grounds, warehouses, silos, cold chain facilities etc.  
| | | • Rwanda National Cooling Strategy recognizes the need for energy-efficient and climate-friendly cooling solutions to support agriculture, fisheries, horticulture and trade  
| | | • Social protection: promote behavioral change around food hygiene e.g., food stalls  
| | | • Priv. sector & youth dev.: Development of urban infrastructure, feeder roads and transport services, including 14100 km of scheduled bus routes to improve transport of agricultural products to markets  
| | | • Infrastructure financing is limited, with road capacity needed in key food producing regions e.g., Gishwati (a milk-producing region)  
| | | • Limited infrastructure constrains food flows and availability for trade, consumption or processing  
| | | • De-risking mechanism not in place to ensure sufficient financing of micro-supply chains in rural areas  
| | | • Installed facilities are unused (<50% cold rooms in use due to poor management, maintenance, few market linkages, limited coordination with producers)  
| | | • Strategy aims at scaling up cold chains and off-grid cooling infrastructures  
| | | • Need to detail the social and economic ROI of opportunities e.g., community markets, collection centers, whole-sale markets and export logistics facilities e.g., packing houses  
| | | • Continue exploring re-allocation of resources to ease significant bottlenecks in supply chain  
| | | • Explore means to incentivize credit extension to build infrastructure including PPPs  
| Environmental resilience | High vulnerability to the effects of climate change, and emerging challenges from crop disease, insects and changing biodiversity profile | • PSTA 4 recognizes the changes in climate and hence the impact on environment and agricultural activities. Due to limited land, focus on production and intensification, farmers increasingly cultivate on steep hills  
| | | • Env. and Nat. resource: Increased sustainable use of land and resources  
| | | • Social Protection : Community resilience through agriculture support programs  
| | | • Cultivation on steep slopes is not aligned with sufficient resourcing to combat soil erosion: terracing and other cost-effective measures  
| | | • Modelling of climate variation and associated planning for changes in seasonal rainfall patterns  
| | | • Reducing electricity costs to limit reliance on firewood for fuel  
| | | • Deploy more sustainable resource management practices Explore harvesting N-fixing plants  
| | | • Accelerate transition from rain-fed to irrigated agriculture  
| | | • Potential to leverage climate related data to mitigate changes to climate  

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Linking potential gaps, policies and opportunities to the key challenges of Rwanda's food system yields several issues and opportunities (III/III)

<table>
<thead>
<tr>
<th>Key challenges in FS</th>
<th>Current policies related to challenge (non-exhaustive)</th>
<th>Potential policy opportunities</th>
<th>Potential Implications</th>
</tr>
</thead>
</table>
| Livelihoods equity: Limited income and income growth for those that depend on agriculture for their livelihoods | • NST1 commits to improved management of the One Cow per Poor family (Girinka) and other social protection programs, supporting poor households to acquire small livestock  
• PSTA 4 seeks to enhance graduation from poverty and extreme poverty and promote resilience by raising production; investment in skills development across value chains is needed to meet required talent levels  
• Financial: Limited mechanisms in place to provide financing to small holder farms  
• Transport: Investment in feeder roads to improve access to market | • Current environment limits income growth avenues given; limited market access; mechanisms/incentives to improve credit growth to farmers; and extending relevant skills development that has limited value addition of products  
• High transaction costs in the produce market leads to low returns for rural farmers due to low prices for their produce, and high prices for urban buyers  
• Explore adoption of area-yield index insurance to protect farmers incomes from climate related impacts  
• Explore credit extension through credit risk scoring innovation  
• Educate farmers on value addition techniques | • Explore adoption of area-yield index insurance to protect farmers incomes from climate related impacts  
• Explore credit extension through credit risk scoring innovation  
• Educate farmers on value addition techniques |
| Financing and investment: Too little financing channeled towards food production and agro-processing due to perceptions of risk leading to low processing capacity | • Vision 2050 aims for better insurance and financial services and other risk management and transfer tools  
• PSTA4 emphasizes the need for financial services in agriculture, capacity development and improved financial literacy and credit-worthiness of producer cooperatives and SMES  
• PSTA 4 and Finance: >50% of budget allocated to improving productivity, 25% to inclusive markets | • Infrastructure financing is limited, with infrastructure gaps increasing transaction costs in production, processing & market access  
• Investment plans in PSTA-4 to improve linkages between production and processing need spatial specificity to explicitly target districts with high production and connect them to districts with production shortages  
• Develop opportunities in fit-for-purpose agricultural financial products targeting smallholder farmers and MSME agribusinesses, women and youth  
• Strengthen nascent re-insurance sector for effective risk transfer and affordable insurance  
• Articulate the role and need for ICT in data management, sharing and integration along value chains | • Develop opportunities in fit-for-purpose agricultural financial products targeting smallholder farmers and MSME agribusinesses, women and youth  
• Strengthen nascent re-insurance sector for effective risk transfer and affordable insurance  
• Articulate the role and need for ICT in data management, sharing and integration along value chains |
Planning phases of mid-term strategies and annual discussions are potential windows to change or adopt new policy.

- Cross-sectoral
  - National Strategy for Transformation
  - NST 2

- Sector specific
  - Policies (e.g., NAP)
  - Strategies (e.g., PSTA4)
  - New strategies (e.g., PSTA5)

- District specific
  - District Development Strategies

- Annual plans

- Preparation phase for mid-term strategies and plans
- Mid-term review of sector plans
- Annual discussions; presidential pledges, national retreat, dialogue council can influence priorities in mid-term and annual plans

See deep-dive on next page.
Multiple opportunities to change or develop new policies along the process

1. **Problem identification**
   - Need for a new policy including vision is identified through top-down & bottom-up processes. Includes ensuring alignment with national priorities.

2. **Research & agenda setting**
   - Public institutes, agenda setting groups meeting quarterly to discuss policy and gaps, suggest new policies.

3. **Lobby & input from civil society**
   - Opinion forms as industry associations, interest forums, and PA firms make their voices heard.

4. **Policy formulation**
   - Parliamentary committees & task forces make bill recommendation to the Ministry.

5. **Policy decision making**
   - Ministry approves or rejects the proposal, 1st and 2nd chamber vote, and bill is signed.

6. **Implementation & monitoring and evaluation**
   - Once approved, policy is implemented in cascade by ministries, local government and finally stakeholders e.g., farmers, processors. Imihigo used to track progress.

**Key stakeholders (non-exhaustive)**
- **Top down** - President, Sector working group, RAB
- **Bottom up** - villages, sectors, districts
- Sector working groups, Intl Community (FAO), Academia (e.g., Univ. of Rwanda), Dev. partners (WB, EU)
- CSO’s, Private sector, citizens, farmer coop’s, medica
- Technical advisors
- Parliament
- National institute of Statistics; Ministry of local government, Private sector, development partners

1. Public Affairs
Stakeholder landscaping
### First overview of key stakeholders of food systems in Rwanda (I/II)

<table>
<thead>
<tr>
<th><strong>Public sector</strong></th>
<th><strong>Int. community and development org.</strong></th>
<th><strong>Private sector</strong></th>
<th><strong>Civil society and other</strong></th>
<th><strong>Academia</strong></th>
<th><strong>Media</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. of Agriculture and Animal Resources</td>
<td>European Union</td>
<td>Africa Improved Foods</td>
<td>Imbaraga Farmers Fed.</td>
<td>University of Rwanda</td>
<td>Rwanda Television</td>
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<td>Nat. Child Dev Agency</td>
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<td>Inyange</td>
<td>SUN alliance</td>
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<td>Radio Rwanda</td>
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<td>World Bank</td>
<td>One Acre Fund</td>
<td>ADECOR (consumer protection union)</td>
<td>CGIAR</td>
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<td>Japanese International Cooperation Agency</td>
<td>Bank of Kigali</td>
<td>Trade Union Centre of Workers of Rwanda</td>
<td>Rwanda Agricultural Research Institute (ISAR)</td>
<td>The Rwandan</td>
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<td>Rwanda co-operative agency</td>
<td>Institute of Policy Analysis and Research – Rwanda</td>
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<td>Min. of Local Govt</td>
<td>Rwanda Institute for Conservation Agriculture</td>
<td>Sosoma Industries Ltd</td>
<td>ACORD</td>
<td>Rwanda Polytechnic</td>
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<td>Food &amp; Agriculture Organization</td>
<td>ACRE Rwanda</td>
<td>Rwanda Organic Agriculture Movement (ROAM)</td>
<td>Rwanda Agricultural Research Institute (ISAR)</td>
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<tr>
<td>Min. of Youth and Culture</td>
<td>World Food Programme</td>
<td>Pula</td>
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<td>Regional Research Centre for Integrated Development</td>
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<tr>
<td>Min. of Gender and Family promotion</td>
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<td>Seed Co International Rwanda Ltd</td>
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<td>National Institute of Statistics</td>
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<td>Yara Rwanda Ltd</td>
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<td>Agriterra</td>
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<td>Environmental Protection Agency</td>
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</tbody>
</table>

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*continued next page*
## First overview of key stakeholders of food systems in Rwanda (II/II)

<table>
<thead>
<tr>
<th>Public sector</th>
<th>Int. community and development org.</th>
<th>Private sector</th>
<th>Civil society and other</th>
<th>Academia</th>
<th>Media</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rwanda Agriculture Board</td>
<td>Clinton Foundation</td>
<td>Rwanda Trading Company</td>
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<td>National Agriculture Export Dev. Board</td>
<td>African Union</td>
<td>Bufcoffee Ltd</td>
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<tr>
<td>Min. of Infrastructure</td>
<td>East African Grain Council</td>
<td>Magerwa</td>
<td></td>
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<tr>
<td>Lands Commission Rwanda</td>
<td>Government of Sweden</td>
<td>Kumwe</td>
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<td>Kilimo Trust</td>
<td>Horizon Sopyrwa</td>
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<tr>
<td>Rwanda Water Resource Commission</td>
<td>Agriprofocus</td>
<td>H2O Impact ventures</td>
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<tr>
<td>Ministry of ICT &amp; Innovation</td>
<td>IFC</td>
<td>Laterite data research advisory</td>
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<tr>
<td>Rwanda Standard Board</td>
<td>International Fertilizer Development Center</td>
<td>Rwanda Private Sector Federation (PSF)</td>
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<td>Rwanda Food and Drug Authority</td>
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<td></td>
<td>Rwanda initiative for sustainable development</td>
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<td></td>
<td>Access to Finance Rwanda</td>
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</table>
### Main stakeholders relevant to key food systems challenges (I/II)

<table>
<thead>
<tr>
<th>Key challenges in FSc</th>
<th>Relevant supra-indicators related to FS challenge</th>
<th>Stakeholders'¹ that seem most actively involved</th>
<th>Initial view on key decision maker(s)²</th>
<th>Stakeholders that could be more actively involved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diet quality and Nutrition Security &amp; diversity: Limited production diversity to meet population's nutritional needs</td>
<td>Diet Quality - Food consumption score Nutrient supply Overweight and Obesity Production diversity</td>
<td>Min. of Agriculture and Animal Resources Min. of Health Min. of Local Government Min. of Trade and Industry Min. of Gender and Family planning European Union</td>
<td>G. Mukeshimana - Minister MINAGRI J. Ngabitsinze - Min. of State MINAGRI Dr. N. Daniel - Minister MoH Dr. T. Dushime - Technical Advisor MoH</td>
<td>National Child Development Agency</td>
</tr>
<tr>
<td>Agricultural productivity Production levels and yield low, with production methods that might harm long-term sustainability</td>
<td>Affordability - cost of health diet as % of household food expenditure Land - % deforestation for agric. land Regeneration: Biodiversity and habitat index Sustainability of diet Emissions</td>
<td>Min. of Agriculture and Animal Resources Min. of Trade and Industry Min. of Local Government Min. of Finance and Economic Planning Howard Buffet Foundation</td>
<td>G. Mukeshimana - Minister MINAGRI J. Ngabitsinze - Min. of State MINAGRI Herbert Asiimwe - Director Baking MINECOFIN H. Buffet - CEO H. Buffet Foundation</td>
<td>Min. of ICT Min. of Infrastructure Min. of Education Rwanda Agriculture Board Media (Rwandan Television, radio)</td>
</tr>
<tr>
<td>Infrastructure capacity Under-developed supply chain infrastructure with limited private sector investment</td>
<td>Risk distribution - propn of men/women with access to financial services Food loss - % of food loss across supply chain Food waste - Food waste index</td>
<td>Min. of Infrastructure Min. of Trade and Industry Min. of Finance and Economic Planning Min. of Local Government European Union Min. of Agriculture and Animal Resources</td>
<td>C. Gatete - Minister MININFRA H. Béata - Minister MINICOM J. Munyurangabo - Director planning MINICOM N. Bellomo - EU Amb. to Rwanda</td>
<td>Min. of ICT Private sector logistics players (e.g, Kumwe)</td>
</tr>
</tbody>
</table>

¹ Stakeholders involved in policy design/implementation; Decision makers are those who influence directly impact food systems policy or implementation

² Initial view on key decision maker(s) is subjective and based on current understanding and may change with time.
### Main stakeholders relevant to key food systems challenges (II/II)

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<tr>
<th>Key challenges in FScc</th>
<th>Relevant supra-indicators related to FS challenge</th>
<th>Stakeholders(^1) that seem most actively involved</th>
<th>Initial view on key decision maker(s)(^2)</th>
<th>Stakeholders that could be more actively involved</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Environmental resilience</strong>&lt;br&gt;High vulnerability to the effects of climate change, and emerging challenges from crop disease, insects and changing biodiversity profile</td>
<td>- Emissions - GHG emissions from agriculture&lt;br&gt;- Land - % deforestation for agriculture land&lt;br&gt;- Food Loss - % of food loss across supply chain&lt;br&gt;- Regeneration - Biodiversity and habitat index&lt;br&gt;- Food waste - Food waste index&lt;br&gt;- Risk distribution&lt;br&gt;- Environmental : ND-Gain</td>
<td>- Min. of Environment&lt;br&gt;- Min. of Agriculture and Animal Resources (RAB)</td>
<td>- J. Mujawamariya - Minister MoE&lt;br&gt;- P. Karangwa - Director Gen. RAB</td>
<td>- Min. of Infrastructure (Water and Sanitation Corporation)</td>
</tr>
<tr>
<td><strong>Livelihoods equity</strong>&lt;br&gt;Limited income and income growth for those that depend on agriculture for their livelihoods</td>
<td>- Economic - household resilience capacity index&lt;br&gt;- Financial - % of men/women engaged in FS&lt;br&gt;- Social -&lt;br&gt;- Gender equity : Women empowerment in agric. Index&lt;br&gt;- Income - Gap between farmgate and retail price &amp; Gini coefficient</td>
<td>- Min. of Agriculture and Animal Resources&lt;br&gt;- Min. of Finance and Economic Planning&lt;br&gt;- Min. of Gender and Family Promotion&lt;br&gt;- Trade Union Centre of Workers of Rwanda&lt;br&gt;- Rwanda co-operative agency</td>
<td>- Dr. U. Ndagijimana - Minister MINECOFIN&lt;br&gt;- Dr. U. Claudine - Min. of State MINECOFIN&lt;br&gt;- G. Mukeshimana -Minister MINAGRI&lt;br&gt;- J. Ngabitsinze- Min. of State MINAGRI</td>
<td>- Development partners (World Bank, EU, JICA, Howard Buffet Foundation)&lt;br&gt;- Min. of Trade and Industry</td>
</tr>
</tbody>
</table>

1. Stakeholders involved in policy design/implementation; Decision makers are those who influence directly impact food systems policy or implementation
Executive Summary

Approach and key insights from Diagnostic and Landscaping Analysis

Detailed Diagnostic Analysis

Detailed Policy and Stakeholder Landscaping

Next Steps: from Diagnostic to Action

Appendix
With the Diagnostic and Landscaping analysis completed, it is time to think about "what comes next"

### Food Systems Transformation

<table>
<thead>
<tr>
<th>Engagement</th>
<th>Diagnostic analysis (April - Aug 2021)</th>
<th>Policy development</th>
<th>Policy implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>National government</td>
<td>National government</td>
<td>Development of policies, with engagement of:</td>
<td>Implementation of policies, with engagement of:</td>
</tr>
</tbody>
</table>

- Integrative leadership and capacity
- Political will and commitment

- Connection to relevant agencies
- Access to data and relevant officials
- Interaction with Food System Dialogues
- National TIP structure

- Key food system challenges and opportunities, based on fact base
- Key policy gaps, incoherencies, and opportunities
- Key data and evidence gaps

- Process facilitation and coordination
- Identify potential policies
- Analyses, modelling and evidence generation & synthesis
- On-demand expertise
- M&E, learning, implementation research, cross-pollination

- Ministries and agencies
- Legislature
- Private sector
- Civil society
- Academia
- Other stakeholders

- Ministries and agencies
- Private sector
- Civil society
- Other stakeholders

- Country prioritization and selection
- High-level government engagement

UN Food Systems Summit
September
We believe that it is the time to harness the momentum of the UN Food Systems Summit towards accelerated food systems transformation

Countries increasingly realizing the need for integrated policy and governance structures that build on what works while addressing functional gaps

Ambitious commitments expected at the Summit: a moment to move beyond visioning and analysis to planning for action and accelerating change

Need to support to countries to navigate the complexities of food systems transformation

Food system gaps and aspirational outcomes articulated at FSS Dialogues bringing together a wide range of stakeholders

Realization that coalitions of diverse partners are required for food systems transformation
To enable locally-led transformative and integrated action in the food system, there is a need for an integrator, facilitator and curator to provide support.

**Wide range of initiatives, resources and complexities coming at countries**

**Publications and reports** (academic publications, private and public sector reports, etc.)

**Frameworks** (CAADP, Food Systems Dashboard, FSS action tracks, HPLE, etc.)

**Data sources** (FAO, UN, World Bank, WHO, FS Dashboard, ReSAKSS, WFP, etc.)

**Targets and policies** (SDGs, WHO 2025, Malabo Declaration, national strategies, etc.)

**Food systems complexity**

**Phase 1: Diagnostic & landscaping analysis**
- Created a diagnostic tailored to the country’s context and focused on implementation
- Identified existing data gaps & approaches to fill
- Brought together quantitative data analysis and qualitative policy & stakeholder mapping
- Built the foundation for local prioritization and ambition setting
- Created buy-in through our co-creative and iterative approach

**Phase 2: Transformative and integrated policies**
- Support local leadership to integrate existing initiatives and resources into a coherent and prioritized approach
- Facilitate country ambition setting & prioritization
- Convene stakeholders for an inclusive & integrated approach
- Build local analytical capacity

**FS-TIP can help navigate complexity**

**Need for an integrator, facilitator and curator to help turn this complexity into transformative and integrated action**

**Support governments to accelerate towards the vision of sustainable healthy diets for all starting with evidence-based policy design and implementation**

Ministries of Agriculture, Health, Environment, Trade, Local Government, etc.
Need to align objectives and policies across ministries to accelerate food systems transformation

**Equitable livelihoods that deliver sustainable healthy diets for all**

**Ministry of Agriculture**
- Enhanced smallholder incomes
- Quality farmer extension training
- Increased productivity
- Access to inputs

**Ministry of Health**
- Healthy citizens; extended lifespans
- Non-communicable disease cost avoidance
- Reduction in stunting and wasting

**Ministry of Industry and Trade**
- Increased value addition activities
- Development of a “good food” processing sector
- Linkages across the value chain

**Ministry of Environment**
- Protection & restoration of natural resources
- Management of water & land resources
- Building resilience against climate change and shocks

Enablers: Investment & innovation

Harnessing the Food Systems Summit Dialogues & FS-TIP diagnostic analysis to prioritize challenges & policies
Prioritize set of food system challenges: Align stakeholders on the most urgent and important challenges and identify how they align with existing strategies and policies

Set ambition and formulate policy to address priority challenges:
- Convene the public, private, development, academic, and social sectors, as well as civil society and the media, to develop a national ambition and priorities for action
- Formulate the relevant policies, addressing interdependencies, synergies and trade-offs with robust analysis and evidence
- Outline the funding, programs, processes, and monitoring and evaluation mechanisms to address challenges

Design governance, coordination and delivery models for locally-led food system transformation: functions, processes, funding, capacity building and use of technology to drive efficiency and effectiveness

Three key actions to move from diagnostic to actions to realize country-owned food systems transformation
Required conditions in country for successful food systems transformation

Government support at the highest level
President or Prime Minister to support a national agenda for food systems transformation and empower the governance structure with the necessary mandate

Highly capable, independent and respected leadership
Champion(s) that can lead planning and delivery efforts, make tough decisions, face vested interests, and inspire others to set bold ambitions and realize them

Strong multidisciplinary local teams that can "over-deliver"
- Strong local team(s), with technical expertise to build capacity over time
- Accelerated delivery of programs at scale
- Leveraging digital technology to make and measure impact
- Ability to scale up and scale down required capabilities in an agile way

Governance, coordination and delivery models for a high-performance culture
- Well designed set of performance indicators and evaluation mechanisms, leveraging the FS-TIP 'scorecard/dashboard' as the baseline
- Structures that can adapt to changing realities and evolving insights

Sufficient and sustainable funding for intergenerational effort
Blend of public, development and private sector finance and investment to realize ambition over a 10+ year period
The in-country governance structure to drive food systems transformation should follow five design principles

**Bold transformative agenda with a clear review process**
Able to set bold ambitions for true food system transformation, with equally ambitious local capacity-building goals; accountable to national government via a formal review process

**Integrate all components of the food system**
Must work across all components of the food system to enable prioritization, coordination and integration of policies, leverage synergies and manage trade-offs

**Connect stakeholders from local to regional to global levels**
Ensures all voices are heard, siloes are broken and coordination takes place between stakeholders; brings subnational, national, regional, and global stakeholders together in an inclusive and meaningful way enriched by feedback to the stakeholders and public

**Long-term commitment and strong, clear mandate to deliver**
Needs long-term focus (10+ years); must have sufficient mandate to make tough decisions and deliver on ambition within its timeframe; must be able to survive government transitions

**Able to attract funding and investment for implementation**
Should attract funding and investment into food systems from public and private sector, locally and from abroad; will align interests behind shared priorities
From Diagnostic to Action | Four functions to realize food systems transformation

Executive function
- Coordinates and ensures delivery across different Ministries and Government agencies that are part of the FS policy environment
- Sets the priorities and ambitions for transformation
- Conducts analysis, designs policies and programs and supports implementation to realize ambitions
- Ensures development of capacities of local teams

Data custodian and progress reviewing function
- Provides the data foundation for ambition setting and prioritization of actions, based on FS-TIP scorecard of supra- and key indicators
- Tracks progress towards the ambitions
- Enables performance comparisons across countries (in Africa) through the CAADP biennial review

Inclusive participation function
- Brings together voices of all food system stakeholders
- Breaks down siloes between actors and components of the food system
- Acts as a “checks and balances” mechanism to ensure policies are relevant and implementable
- Has an advisory, consultative or participatory role in decision-making

Thinking and advisory function
- Brings together academics, development partners and other stakeholders with expertise in food systems, that are not direct actors
- Develops evidence to inform policy design and implementation
- Continuously develops capacities of local teams

Coordination & budget function
- Ensures coordination between the different functions
- Develops budget for different functions
- Conducts fundraising and mobilizes resources (together with the executive function)

TBD if separate function or part of one of the other functions
## Illustrative set of options for each function

<table>
<thead>
<tr>
<th>Function</th>
<th>Build on existing structure(s)</th>
<th>Transition over time possible</th>
<th>Develop new structure(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Executive function</strong></td>
<td>Select ministries in charge, coordinating in ministerial cluster</td>
<td>&quot;Presidential Initiative' with technical and steering committees</td>
<td>New Food Systems Coordination and Transformation Delivery Unit</td>
</tr>
<tr>
<td><strong>Data custodian and progress reviewing function</strong></td>
<td>CAADP indicators, ReSAKSS, biennial review with added FS elements</td>
<td>CAADP indicators, ReSAKKS, biennial review, supported by detailed FS-TIP scorecard</td>
<td>CAADP indicators, biennial review, FS-TIP dashboard as local version of the Food Systems Dashboard</td>
</tr>
<tr>
<td><strong>Inclusive participation function</strong></td>
<td>SUN Civil Society Network &amp; SUN Business Network expanded to full Food System view</td>
<td>Food Systems Summit Dialogues transformed into a Permanent Forum on Food Systems</td>
<td>New system of food systems consultation &quot;hubs&quot;</td>
</tr>
<tr>
<td><strong>Thinking and advisory function</strong></td>
<td>National Council or National Technical Working Group</td>
<td>Academic institutes connected into food systems platform</td>
<td>New Food Systems Think Tank</td>
</tr>
</tbody>
</table>
Functions can be built upon existing structures or might require new structures

- Existing structures to consider: SUN network, National Technical Working Groups, CAADP and Biennial Review, UN FSS Dialogues, etc.
- New structures can take inspiration from ATA, ATO, etc.

Two or more functions may be combined into a single organizational structure

Each set-up will be developed in-country against a set of criteria

- Ability to be transformative
- Ability to develop and implement integrated policies and programs
- Level of risk associated
- Return on investment
- Others

...which should be defined for each function by the country

There are different options for the exact set-up...
Executive Summary

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Next Steps: from Diagnostic to Action

Appendix
We want to thank the following people and organizations for their feedback and contributions (I/VI):

**Sounding Board with individual contributors from**

- Ministry of Agriculture and Animal Resources
- Ministry of Environment
- Ministry of Local Government
- National Child Development Agency
- Chamber of Deputies
- World Food Programme
- FAO
- IFPRI
- SUN Civil Society Alliance
- ACORD Rwanda
- Inyange
- FCDO (Rwanda)
- One Acre Fund
- University of Rwanda
- SAIC Agribusiness Incubator
- Africa Development Promise
- ADECOR
- Rwanda Agriculture Board
We want to thank the following people and organizations for their feedback and contributions (II/VI)

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<th>Organization</th>
<th>Role in FS-TIP</th>
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</thead>
<tbody>
<tr>
<td>Aimable Nsabimana</td>
<td>Lecturer</td>
<td>University of Rwanda</td>
<td>Country Expert</td>
</tr>
<tr>
<td>Armin Lalui</td>
<td>Director</td>
<td>Vanguard Economics</td>
<td>Country Expert</td>
</tr>
<tr>
<td>Jules Kazungu</td>
<td>Managing Director</td>
<td>Regional Research Centre for Integrated Development (RCID)</td>
<td>Country Expert</td>
</tr>
<tr>
<td>Kirimi Sindi</td>
<td>Founder and CEO</td>
<td>Life Trust</td>
<td>Country Expert</td>
</tr>
<tr>
<td>Maryse Umugwaneza</td>
<td>Lecturer</td>
<td>University of Rwanda</td>
<td>Country Expert</td>
</tr>
<tr>
<td>Petronille Dusingizimana</td>
<td>PhD Candidate</td>
<td>University Felix Houphouet Boigny</td>
<td>Country Expert</td>
</tr>
<tr>
<td>Lloyd le Page</td>
<td>Senior Adviser for Agriculture &amp; Food</td>
<td>Tony Blair Institute for Global Change</td>
<td>TBI Advisor</td>
</tr>
<tr>
<td>James Munanura</td>
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<td>Barbara Mbabazi</td>
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<td>Country Team Member</td>
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<tr>
<td>Peggy Mativo-Ochola</td>
<td>Consultant</td>
<td>Boston Consulting Group</td>
<td>Project Manager (Rwanda)</td>
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<td>Senior Research Fellow</td>
<td>IFPRI</td>
<td>Expert Panel Member</td>
</tr>
<tr>
<td>Alan de Brauw</td>
<td>Senior Research Fellow</td>
<td>IFPRI</td>
<td>Expert Panel Member</td>
</tr>
<tr>
<td>Claudia Ringler</td>
<td>Deputy Director, Environment and Production Technology</td>
<td>IFPRI</td>
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<tr>
<td>Danielle Resnick</td>
<td>Senior Research Fellow</td>
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<tr>
<td>Jemimah Njuki</td>
<td>Director for Africa</td>
<td>IFPRI</td>
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<td>Namukolo Covic</td>
<td>Senior Research Coordinator</td>
<td>IFPRI</td>
<td>Expert Panel Member</td>
</tr>
<tr>
<td>David Spielman</td>
<td>Senior Research Fellow/Program Leader-Rwanda</td>
<td>IFPRI</td>
<td>Expert Panel Member</td>
</tr>
<tr>
<td>Mutinta Hambayi</td>
<td>Chief Nutrition Sensitive Team</td>
<td>World Food Programme</td>
<td>Expert Panel Member</td>
</tr>
<tr>
<td>Daniel Njiwa</td>
<td>Head, Regional Food Trade</td>
<td>AGRA</td>
<td>Expert Panel Member</td>
</tr>
<tr>
<td>Sheryl Hendricks</td>
<td>Head of Department and Professor of Food Security</td>
<td>University of Pretoria</td>
<td>Expert Panel Member</td>
</tr>
<tr>
<td>Robynne Anderson</td>
<td>President</td>
<td>Emerging Ag Inc</td>
<td>Expert Panel Member</td>
</tr>
<tr>
<td>Amos Laar</td>
<td>Associate Professor</td>
<td>University of Ghana</td>
<td>Expert Panel Member</td>
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<tr>
<td>Jeroen Candel</td>
<td>Associate Professor</td>
<td>Wageningen University Research</td>
<td>Expert Panel Member</td>
</tr>
</tbody>
</table>
We want to thank the following people and organizations for their feedback and contributions (IV/VI)

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Organization</th>
<th>Role in FS-TIP</th>
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<tbody>
<tr>
<td>Roy Steiner</td>
<td>Senior Vice President, Food Initiative</td>
<td>Rockefeller Foundation</td>
<td>Advisory Committee Member</td>
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<tr>
<td>Mehrdad Ehsani</td>
<td>Managing Director, Food Initiative, Africa</td>
<td>Rockefeller Foundation</td>
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<tr>
<td>Marie Ruel</td>
<td>Director Poverty, Health and Nutrition Division</td>
<td>IFPRI</td>
<td>Advisory Committee Member</td>
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<tr>
<td>Greg Hallen</td>
<td>Program Leader</td>
<td>IDRC</td>
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<tr>
<td>Joseph Gichuru</td>
<td>Deputy Exec. Director and Head of Operations</td>
<td>APHRC</td>
<td>Advisory Committee Member</td>
</tr>
<tr>
<td>Jonathan Said</td>
<td>Head of Inclusive Growth and Private Sector Development</td>
<td>Tony Blair Institute for Global Change</td>
<td>Advisory Committee Member</td>
</tr>
<tr>
<td>Saskia de Pee</td>
<td>Senior Technical Advisor &amp; Chief Systems Analysis</td>
<td>World Food Programme</td>
<td>Advisory Committee Member</td>
</tr>
<tr>
<td>Ross Smith</td>
<td>Senior Regional Program Advisor</td>
<td>World Food Programme</td>
<td>Advisory Committee Member</td>
</tr>
<tr>
<td>Ousmane Badiane</td>
<td>Founder and Executive Chairperson</td>
<td>AKADEMIYA 2063</td>
<td>Advisory Committee Member</td>
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We want to thank the following people and organizations for their feedback and contributions (V/VI)

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<tr>
<td>Apollos Nwafor</td>
<td>Vice President, Policy and State Capability</td>
<td>AGRA</td>
<td>Advisory Committee Member</td>
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<tr>
<td>Patrick Webb</td>
<td>Technical Adviser to the Global Panel; Professor of Nutrition</td>
<td>Tufts University/Global Panel</td>
<td>Advisory Committee Member</td>
</tr>
<tr>
<td>Jessica Fanzo</td>
<td>Professor of Global Food and Agricultural Policy and Ethics</td>
<td>John Hopkins University</td>
<td>Advisory Committee Member</td>
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<tr>
<td>Lawrence Haddad</td>
<td>Executive Director</td>
<td>GAIN</td>
<td>Advisory Committee Member</td>
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<tr>
<td>Mills Schenck</td>
<td>Managing Director and Partner</td>
<td>Boston Consulting Group</td>
<td>Advisory Committee Member</td>
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<tr>
<td>Shalini Unnikrishan</td>
<td>Managing Director and Partner</td>
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<tr>
<td>Peiman Milani</td>
<td>Consultant</td>
<td>Rockefeller Foundation</td>
<td>Project Management Office</td>
</tr>
<tr>
<td>Katrin Glatzel</td>
<td>Director, Policy Innovation</td>
<td>AKADEMIYA 2063</td>
<td>Project Management Office</td>
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<tr>
<td>Paul Thangata</td>
<td>Senior Policy Advisor</td>
<td>AGRA</td>
<td>Project Management Office</td>
</tr>
<tr>
<td>Elizabeth Kimani</td>
<td>Senior Research Scientist</td>
<td>APHRC</td>
<td>Project Management Office</td>
</tr>
<tr>
<td>Antonina Mutoro</td>
<td>Post-doctoral Research Scientist</td>
<td>APHRC</td>
<td>Project Management Office</td>
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<tr>
<td>Chris Mitchell</td>
<td>Managing Director and Partner</td>
<td>Boston Consulting Group</td>
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<tr>
<td>Jolien Paalman</td>
<td>Project Leader</td>
<td>Boston Consulting Group</td>
<td>Project Management Office</td>
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<tr>
<td>Suraj Shah</td>
<td>Consultant</td>
<td>Boston Consulting Group</td>
<td>Project Management Office</td>
</tr>
<tr>
<td>Shirley Mujera</td>
<td>Consultant</td>
<td>Boston Consulting Group</td>
<td>Project Management Office</td>
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## Supra-indicators

<table>
<thead>
<tr>
<th>Action Tracks</th>
<th>Supra-indicators</th>
<th>Definition of supra-indicators</th>
<th>High</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diet quality:</td>
<td>Food Consumption</td>
<td>Aggregates household-level data on the diversity and frequency of food groups consumed,</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Score (FCS) in</td>
<td>weighting food groups according to the relative nutritional value</td>
<td>30</td>
<td>0</td>
</tr>
<tr>
<td>Malawi</td>
<td>Diet Quality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(GDR+) in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malawi</td>
<td>Nutrient supply:</td>
<td>Net supply in country of key macro and micro nutrients as a share of total consumption</td>
<td>Varies by country</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Net supply in</td>
<td>requirements for a healthy diet</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>country of key</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>macro and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>micronutrients</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>as a share of</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>total consumption</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>requirements</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>for healthy diet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undernourishment:</td>
<td>Percent of</td>
<td>Percentage of the population whose food intake is insufficient to meet dietary energy</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>population</td>
<td>requirements</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>undernourished</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overweight &amp;</td>
<td>Percent of</td>
<td>Abnormal or excessive fat accumulation that presents a risk to health</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>obesity:</td>
<td>population</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>overweight or</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>obese (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food safety:</td>
<td>Africa Food</td>
<td>Combines three food safety indices; Food Safety Systems Index, Food Safety Health Index and</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Safety Index</td>
<td>Food Safety Trade Index</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affordability:</td>
<td>Cost of a</td>
<td>It is the cost of acquiring a healthy diet as a share of total household expenditure being</td>
<td>&lt;50</td>
<td>&gt;50</td>
</tr>
<tr>
<td></td>
<td>healthy diet</td>
<td>spent on food</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sustainability of</td>
<td>Per capita</td>
<td>Total of emissions arising along the entire food value chain from agricultural production</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>diets:</td>
<td>GHG emissions of</td>
<td>to the end consumer</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>food consumption</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Kg CO2eq./person)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food waste:</td>
<td>Food waste</td>
<td>Food that completes the food supply chain up to a final product but still doesn’t get</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>index</td>
<td>consumed because it is discarded, spoilt or expires. At retail and consumption stages</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food environment:</td>
<td>Composite index</td>
<td>Food environment policies that encourage consumption of sustainable and healthy diets</td>
<td>14</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>combining food</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>environment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emissions:</td>
<td>Green House Gas</td>
<td>These are all emissions and removals occurring on ‘managed land’ and that are associated</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>(GHG) emissions</td>
<td>with the use of land for agriculture</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>from agriculture</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(MtCO2e)</td>
<td>(MtCO2e)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land:</td>
<td>Average forest land</td>
<td>Implies permanent loss of forest cover from transformation into agricultural use.</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>deforested in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>hectares for</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>agriculture use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>over the past 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>years (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food loss:</td>
<td>Percent food</td>
<td>Refers to food that gets spilled, spoilt or lost, or reduces in quality and value during</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>loss across</td>
<td>supply chain before reaching final product. From production to distribution</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>supply chain (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regeneration:</td>
<td>Biodiversity and</td>
<td>Assesses countries’ actions toward retaining natural ecosystems and protecting the full range of biodiversity</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>habitat index</td>
<td></td>
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### Ideal scores defined for the supra-indicators (I/II)
## Supra-indicators | Ideal scores defined for the supra-indicators (II/II)

<table>
<thead>
<tr>
<th>Action Tracks</th>
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<th>Definition of supra-indicators</th>
<th>High</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advance equitable livelihoods</td>
<td><strong>Income</strong>: Gini coefficient (specific) based on incomes across the food system (under development)</td>
<td>• Highlight's income distribution among various players in the food systems. Zero indicates a perfectly equal distribution of income within the FS while 100 represents a perfect inequality when one person in a population receives all the income, while other people earn nothing</td>
<td>Varies by country</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Income</strong>: Gap between farmgate price and wholesale price (%)</td>
<td>• Highlights the gap between farmgate price and retail price. Compares income to farmers vs prices paid by consumers. Better if narrow</td>
<td>0</td>
<td>TBD</td>
</tr>
<tr>
<td></td>
<td><strong>Gender equity</strong>: Women empowerment in agriculture index</td>
<td>• Shows the degree to which women are empowered in their households and communities and the degree of inequality between women and men (who are married or in some other form of partnership) within the same household. Measures the empowerment, agency, and inclusion of women in the agriculture sector</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Build resilience to vulnerabilities, shocks and stress</td>
<td><strong>Economic</strong>: Household Resilience Capacity Index</td>
<td>• Estimates household resilience to food insecurity with a quantitative approach to establish a cause effect relationship between resilience and its critical determinants</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td></td>
<td><strong>Risk distribution</strong>: Proportion of men and women engaged in agriculture with access to finance</td>
<td>• Access of micro and macro credit by people involved in the agriculture sector</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td><strong>Social</strong>: Government social security budget as a % of total requirements to cover vulnerable group (%)</td>
<td>• The amount of money that the country allocates for preventive, protective, promotive or transformative assistance to farm individuals, households or communities</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td><strong>Environmental</strong>: ND-GAIN (Notre Dame Global Adaptation Initiative) Country Index</td>
<td>• Summarizes a country’s vulnerability to climate change and other global challenges in combination with its readiness to improve resilience</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td><strong>Production diversity</strong>: Percent of kilograms from top 5 crops produced (%)</td>
<td>• The proportion of production occupied by the key foods produced in the country</td>
<td>&lt;50</td>
<td>&gt;50</td>
</tr>
<tr>
<td>Governance</td>
<td><strong>Governance</strong>: Food Systems Transformation Governance Index</td>
<td>• Combines key components such as vision, ambition which are essential for food systems transformation</td>
<td>14</td>
<td>0</td>
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</table>
### Supra-indicators | Data sources for supra-indicators data in Rwanda

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
<th>Data Source</th>
<th>Year</th>
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<tr>
<td>1. Diet quality</td>
<td>Food Consumption Score (FCS) in Rwanda and Malawi</td>
<td>CFSVA</td>
<td>2018</td>
</tr>
<tr>
<td>2. Nutrient supply</td>
<td>Net supply in country of key macro and micro nutrients as a share of total consumption requirements for a healthy diet</td>
<td>National Survey</td>
<td>2020</td>
</tr>
<tr>
<td>3. Undernourishment</td>
<td>Percent of population undernourished (%)</td>
<td>World Bank</td>
<td>2018</td>
</tr>
<tr>
<td>4. Overweight &amp; obesity</td>
<td>Percent of population overweight or obese (%)</td>
<td>WHO</td>
<td>2016</td>
</tr>
<tr>
<td>5. Food safety</td>
<td>Africa Food Safety Index</td>
<td>WHO</td>
<td>2017</td>
</tr>
<tr>
<td>6. Affordability</td>
<td>Cost of a healthy diet as a percent of household food expenditure (%)</td>
<td>FAO-SOFI</td>
<td>2020</td>
</tr>
<tr>
<td>7. Sustainability of diets</td>
<td>Per capita GHG emissions of food consumption (Kg CO2eq./person)</td>
<td>WWF</td>
<td>2010</td>
</tr>
<tr>
<td>8. Food waste</td>
<td>Food waste index</td>
<td>UNEP</td>
<td>2021</td>
</tr>
<tr>
<td>9. Food environment</td>
<td>Composite index combining food environment policies</td>
<td>WHO NCD Monitor</td>
<td>2021</td>
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<tr>
<td>10. Emissions</td>
<td>Green House Gas (GHG) emissions from agriculture (MtCO2e)</td>
<td>Climate Watch</td>
<td>2018</td>
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<tr>
<td>11. Land</td>
<td>Average forest land being deforested for agriculture use over past 3 years</td>
<td>World Bank, Forest Watch</td>
<td>2019</td>
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<tr>
<td>12. Food loss</td>
<td>Percent food loss across supply chain (%)</td>
<td>National sources</td>
<td>TBD</td>
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<tr>
<td>13. Regeneration</td>
<td>Biodiversity and habitat index</td>
<td>EPI</td>
<td>2019</td>
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<tr>
<td>14. Income</td>
<td>Gini coefficient (specific) based on incomes across the food system (under development)</td>
<td>National survey</td>
<td>No data</td>
</tr>
<tr>
<td>15. Income</td>
<td>Gap between farmgate price and wholesale price (%)</td>
<td>CAADP Biennial Review</td>
<td>2018</td>
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<tr>
<td>16. Gender equity</td>
<td>Women empowerment in agriculture index</td>
<td>MINAGRI/IPRI</td>
<td>2018</td>
</tr>
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<td>17. Economic</td>
<td>Household Resilience Capacity Index</td>
<td>FAO</td>
<td>TBD</td>
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<tr>
<td>18. Risk distribution</td>
<td>Proportion of men and women engaged in agriculture with access to macro and micro credit financial services</td>
<td>CAADP Biennial Review</td>
<td>2018</td>
</tr>
<tr>
<td>19. Social</td>
<td>Government social security budget as a % of total requirements to cover vulnerable group (%)</td>
<td>CAADP Biennial Review</td>
<td>2018</td>
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<td>21. Production diversity</td>
<td>Percent of kilograms from top 5 crops produced (%)</td>
<td>FAO</td>
<td>2019</td>
</tr>
<tr>
<td>22. Governance</td>
<td>Food Systems Transformation Governance Index</td>
<td>National policies</td>
<td>2021</td>
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</table>
## Summary list of Sources by Supra-Indicator (I/III)


---

Please reach out to authors of this document to access detailed metadata
Summary list of Sources by Supra-Indicator (II/III)


16 Sources: 1. FTF Progress WEAI Baseline Report 2. MINAGRI Gender and Youth mainstreaming strategy, 2019 3. Feed the Future: Measuring Progress toward Empowerment; Woment Empowerment in Agriculture Index, 2014


Please reach out to authors of this document to access detailed meta data


## Glossary

### List of abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>AGRA</td>
<td>Alliance for Green Revolution in Africa</td>
</tr>
<tr>
<td>APHRC</td>
<td>African Population &amp; Health Research Centre</td>
</tr>
<tr>
<td>AU</td>
<td>African Union</td>
</tr>
<tr>
<td>AUC</td>
<td>African Union Commission</td>
</tr>
<tr>
<td>BCG</td>
<td>Boston Consulting Group</td>
</tr>
<tr>
<td>CAADP</td>
<td>Comprehensive Africa Agriculture Development Programme</td>
</tr>
<tr>
<td>EAC</td>
<td>East Africa Community</td>
</tr>
<tr>
<td>FAO</td>
<td>Food and Agriculture Organization of the United Nations</td>
</tr>
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<td>FCS</td>
<td>Food Consumption Score</td>
</tr>
<tr>
<td>FSS</td>
<td>Food Systems Summit</td>
</tr>
<tr>
<td>FS-TIP</td>
<td>Food System Transformative Integrated Policy</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GHG</td>
<td>Green House Gas</td>
</tr>
<tr>
<td>HLPE</td>
<td>High Level Panel of Experts on Food Security and Nutrition</td>
</tr>
<tr>
<td>IDRC</td>
<td>International Development Research Centre</td>
</tr>
<tr>
<td>IFPRI</td>
<td>International Food Policy Research Institute</td>
</tr>
<tr>
<td>NCD</td>
<td>Non-Communicable Diseases</td>
</tr>
<tr>
<td>ND-GAIN</td>
<td>Notre Dame Global Adaptation Initiative</td>
</tr>
<tr>
<td>SDGs</td>
<td>Sustainable Development Goals</td>
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<tr>
<td>UN</td>
<td>United Nations</td>
</tr>
<tr>
<td>WFP</td>
<td>World Food Programme</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
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</tbody>
</table>
Acknowledgments for this document

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