



CONNECTING THE DOTS:

Policy Innovations for Food Systems Transformation in Africa



Among African nations, Rwanda is increasingly acknowledged for its achievements in accelerating economic growth. Since 2000, the country has seen over 7.7 percent annual GDP growth.¹ Key to this success is Rwanda's agricultural sector, which remains central to poverty reduction, improving livelihoods, and economic growth. The sector accounts for 67.4 percent of the active workforce and, in 2020, contributed 26 percent to the total GDP.^{2,3} Notably, the agricultural sector was estimated to have accounted for a third of overall poverty reduction between 2001 and 2011.^{4,5} Moreover, the agricultural sector has seen significant annual growth of an average of 5 percent since 2007 through land expansion and scaled investments.⁶

Nevertheless, there remain challenges that leave communities vulnerable to food insecurity and malnutrition, environmental degradation and climate change, and socio-economic shocks. One such challenge is that crop production remains at only 45 percent of its yield potential.⁷ Furthermore, while wasting and stunting rates among children under five have been steadily decreasing since the beginning of the 2000s, undernourishment in the



general population has been increasing, going from 22.2 percent in 2012 to 35.6 percent in 2020; in 2018, almost 20 percent of the population was recorded as food insecure.^{8,9} Rural households thus remain exposed to a wide range of shocks that may compromise their access to nutritious food.

Rwanda has, even so, witnessed a significant transformation in the past two decades. The country's performance has been driven by the government's strong commitment to improving livelihoods, economic growth, and food security.¹⁰ Being the first nation to sign the Comprehensive Africa Agriculture Development Program (CAADP) in 2007, and receiving global recognition for its alignment with the Sustainable Development Goals, Rwanda has demonstrated its commitment to meeting agricultural transformation targets.¹¹ To reach these goals, the government has articulated the importance of taking a holistic "food systems approach for enhanced nutrition and household food security" and of ensuring that Rwanda's interventions in its food and agricultural sectors are all-inclusive.¹² The country has thus prioritized the development of multisectoral strategies, policies, institutions, programs, and funds that focus on transforming its food systems.

Notably, Rwanda has adopted a multisectoral approach to tackling food systems by designing an institutional framework that allows for the collaborative development and coordinated implementation of policies and programs. Cross-sectoral cooperation through multiple institutional structures that engage the state, civil society, and private sector is making possible the comprehensive and inclusive design and pursuit of national objectives. Rwanda's state cooperation across policies, programs, and institutional activities demonstrates the government's commitment to tackling the multifaceted nature of food systems. Additionally, a strong national agenda for market-led growth, combined with the adoption of institutional structures that attract and manage sustainable investment from the private sector, are assisting in financing interventions to address food systems challenges. As such, Rwanda's progress thus far and its ambitious agenda for change is illustrated by its strength in the CAADP Second Biennial Review Report, where it scored in the top 10 countries that are successfully pursuing actions to improve livelihoods and increase prosperity through an African agricultural transformation. This is discussed in detail below.

INSTITUTIONAL INNOVATIONS

Due to the multifaceted nature of food systems, multiple institutions and initiatives are responsible for the gradual transformation of Rwandan food systems.

The Ministry of Agriculture and Animal Resources (MINAGRI) is the main institution responsible for the policies and programs that seek to improve food security, agricultural productivity, diversification, and growth. MINAGRI introduces policies and programs to facilitate a sustainable agricultural transformation through market-led agricultural growth. It operates through two implementing institutions, the Rwanda Agriculture and Animal Resources Development Board (RAB) and the National Agricultural Export Development Board (NAEB). Established in 2017, the RAB's purpose is to ameliorate food insecurity and poverty by transforming agriculture into a smart, resilient, and productive sector, centering research and knowledge sharing, the adoption of innovative technologies, and private sector participation as key components for success.[‡] The RAB is responsible for the implementation of key agricultural policies that are focused on animal husbandry, technology innovation and adoption, training, extension services, and the coordination of stakeholders in programs and policies.¹³ The NAEB promotes economic prosperity and diversification and aims to strengthen Rwanda's agribusiness and export activities, with a target to reach US\$ 1 billion in export revenues by 2024.^{§,14,15}

Multistakeholder financial planning

The Ministry of Finance and Economic Planning (MINECOFIN) coordinates and manages planning and policy-making across all sectors. In order to facilitate national planning activities, MINECOFIN works with all relevant line ministries, discussing priorities, evaluating progress, and monitoring implementation.¹⁶ To enhance synergies in the implementation and joint sector review processes, sector and subsector working groups bring together multiple stakeholders, including NGOs, development partners, state institutions, farmers, financial organizations, the private sector, and civil society. The Agriculture Sector Working Group (ASWG), for example, is chaired by MINAGRI; in collaboration with MINECOFIN and multiple partners, it assists in the development of agricultural sector strategies, using various approaches including the organization of public and private stakeholder consultations and workshops. MINAGRI's Sub Sector Working Groups on crop and livestock development, agribusiness, markets and export development, and planning, also support MINECOFIN and MINAGRI in developing collaborative programs with other government institutions and the private sector. More recently, the ASWG has been instrumental in ensuring that the Economic Recovery Plan for COVID-19's agricultural

‡ Law No 14/2017 establishing Rwanda Agriculture and Animal Resources Development Board (RAB) and determining its mission, organisation, and functioning.

§ The law No. 13/2017 (ratified on 14 April 2017) establishes NAEB as commercial public entity, including a new structure.



pillar provides support to existing agriculture and food security initiatives and strengthens institutional capacity to deal with COVID-19's impacts. As such, the government's post-COVID-19 response in terms of agriculture and social protection includes measures to prevent supply chain disruption and food insecurity; these measures include additional funds for input subsidies, strategic grain reserves, food transfers, and livestock services.^{17,18}

The formation of an Agriculture Development Fund is also underway. This fund offers an opportunity to provide targeted financial support to Rwandan agricultural policies; it will seek to incentivize private actors to invest in agricultural activities through offering fiscal incentives for engagement with public-private partnerships (PPPs), competitive funds, and interest loans.¹⁹ The funding will filter between four different sections to stimulate research and knowledge sharing; increase sectoral productivity; enhance agribusiness entrepreneurship; and boost financial inclusion through a Credit Guarantee Scheme. More specifically, through the Agribusiness Window there will be direct support for women in accessing finance, inputs, and information. The provision of seed capital to kickstart the engagement of women in the agricultural sector aims to stimulate inclusive economic activity and an agricultural transformation. Although the Agricultural Development Fund is still in its initial stages, MINAGRI has committed over US\$ 20 million to it. The Ministry has also emphasized throughout its national strategies the benefits of establishing the fund and its importance in using investment opportunities to leverage Rwanda's achievement of national agricultural objectives by supporting the commercialization of agriculture.²⁰

Linking agriculture with nutrition, health, education, and gender

MINAGRI cooperates regularly with different ministries on cross-sectoral projects and policies. Given the complexity of food systems and the overlap between sectoral responsibilities, the coordination between multiple ministries has been identified as being key to Rwanda's progress.²¹ In 2013, the Inter-Ministerial Coordination Committee (IMCC) was established as the highest-level convening body under the Prime Minister's Office; its role was to oversee Rwanda's interventions to reduce malnutrition, including the revision and updating of Rwanda's National Food and Nutrition Policy. The IMCC was made up of representatives from the Ministry of Local Government (MINALOC), the Ministry of Health (MoH), MINAGRI, the Ministry of Education (MINEDUC), and the Ministry of Gender and Family Promotion (MIGEPROF). The objective of the IMCC is to ensure that all necessary stakeholders are involved in the design and review of state initiatives. They meet four times a year to

identify pressing food and nutrition challenges and to assess the progress of activities.²²

Furthermore, MINAGRI has largely decentralized to the district level the authority over institutional priorities with regard to the planning, implementation, and monitoring of local agricultural programs. The Joint Action Development Forum (JADF) assists districts in developing their unique District Development Plans, budgets, and implementing activities. Government agents from MINALOC, NGOs, farmers, agricultural groups, and cultural leaders work together under the JADF umbrella to coordinate on local priorities. The process of decentralization seeks to ensure inclusivity and the alignment of national objectives and local needs.

POLICY INNOVATIONS

Through several initiatives that encompass the complexity of production, processing, transport, and consumption, the Rwandan government has committed to strategies, policies, and programs that will positively transform food systems for people, the planet, and the economy. Rwanda's Vision 2050 and the preceding Vision 2020 are the government's flagship national development agendas that aim to accelerate Rwanda's status from a low- to a middle-income country by 2035 and to a high-income low-carbon economy by 2050.^{23,24} Alongside this, the National Strategy for Transformation (NST I) 2017–2024 presents policies that will accelerate a sustainable economic and social transformation to a more prosperous and equitable Rwanda. Vision 2050 and NST I highlight the government's priorities for specific sectors, including agriculture and health; they provide direction for institutional structures and policy instruments that promote inclusive and prosperous growth. **The African Union's Agenda 2063, the United Nations Sustainable Development Goals, and the CAADP indicators have been carefully woven into Rwanda's development agenda and national policies.**²⁵ Vision 2020, Vision 2050, and the NST I all prioritize agricultural development as being central to wealth creation in Rwanda; as such, they include increasing the productivity of labor and land used for agricultural production, expanding distribution of fertilizers and seeds, increasing the use of irrigation technology, and improving access to key infrastructure and financing.

Vision 2050 and NST I are further detailed through a Strategic Plan for Agricultural Transformation (PSTA), of which Rwanda is currently on its fourth iteration. The three agricultural plans preceding 2018, PSTA I, II, and III, established clear principles for agricultural growth and have developed varying agendas for the central focus and vision for growth. The successful



implementation of PSTA II (2009–2012) enhanced agricultural production and productivity; crop yields increased by an average of 400 percent and postharvest losses declined to less than 15 percent of production. PSTA II reportedly also contributed to a 6 percent reduction of poverty over the period of the policy.²⁶ PSTA III (2013–2017) saw a 5 percent annual growth in the agricultural sector and a 13 percent reduction in poverty.²⁷

In an effort to provide a comprehensive action plan for addressing the multidimensional aspects of food systems, the fourth Strategic Plan for Agriculture Transformation 2018–2024 (PSTA IV) outlines 4 priority areas that address food security, resilience, economic opportunities, and wealth creation. MINAGRI leads the development and implementation of the new PSTA IV (2018–2024), which **adopts a food systems approach and acknowledges the holistic nature of ensuring food security and nutrition, agricultural growth, environmental protection, and economic prosperity for sustainable growth across Rwanda**. The ambitious US\$ 1.5 billion plan aims to commercialize the agriculture value chain and stimulate increased productivity and improved livelihoods. PSTA IV outlines the government's commitment to providing infrastructure, research, social protection, and the necessary resources and management to build a sustainable and thriving Rwandan agricultural sector. This newest strategic plan centers on market-led growth of the agricultural sector, looking to facilitate a sustainable food systems transformation. National objectives for growth include the creation of an enabling environment for greater private sector participation and raising agricultural productivity. Enhanced productivity is particularly supported through greater uptake of mechanization and the diversification of production in order to improve nutrition; all of this is aimed at increasing household incomes, contributing to agricultural growth, and ultimately eradicating rural poverty.²⁸ PSTA IV incorporates initiatives for women and youth that integrate throughout all priority areas; through its policy initiatives, it also highlights the importance of adopting a "green growth" approach to food systems planning. Specifically, PSTA-IV aims "to strengthen resilience against the impacts of climate change and to transform the dominant subsistence farming sector into a competitive and market-led agriculture sector".²⁹

Linking climate action with agriculture

Rwanda's ambition to become a leading climate-resilient economy is demonstrated by the proactive approach that the government has taken in centering adaptation to, and mitigation of, climate change in its national objectives. The Rwandan Green Growth and Climate Resilience Strategy (GGCRS) was

adopted in 2011. It implements 14 cross-sectoral programs which recognize environmental protection as a driver of national economic development and guide low-carbon planning and a green approach to national policy-making. More recently, in 2019, the GGCRS influenced the development of the National Environment and Climate Change Policy (NECCP). Formulated in consultation with MINAGRI, the NECCP acknowledges the drastic impacts that climate change, environmental degradation, and pollution of water and soil have on the agricultural sector and on human health. The policy therefore outlines objectives with regard to the conservation and restoration of vital ecosystems and landscapes, sustainable agriculture, and the establishment of biosafety regulations and early warning systems. More recently, the Rwanda Green Fund (FONERWA) was created to mobilize and manage the resources required for the successful implementation of the GGCRS. FONERWA is an investment fund that works to attract contributions from international development partners. It has funded over US\$80 million in Rwandan green growth projects across different sectors.³⁰

The GGCRS outlines policy objectives that promote agricultural modernization and intensification among smallholder farmers to drive a green revolution. Mitigation strategies to improve agricultural resilience and prosperity in a challenging climate include the integration of soil fertility management, the use of organic fertilizers, and the adoption of clean energy sources.

Inclusive policy-making

To guide the development of PSTA IV, MINAGRI established a task force coordinated by the RAB and the NAEB whose mandate is ensuring the integration of PSTA IV between stakeholders. The task force engages multiple government institutions, sub-sector working groups, development partners including the EU, IFAD, FAO, World Bank, FCDO and USAID, private sector stakeholders, and agricultural communities to gather information on challenges and overlapping agendas for the food system. This coordinated and inclusive approach to understanding the complexities and interlinkages of food systems has strengthened PSTA IV's ability to provide targeted policy frameworks for different goals. Moreover, District Development Plans support the PSTA IV and other sectoral frameworks in actioning the policy agenda at the local level.³¹

Building on the PSTAs, the National Agricultural Policy (NAP), adopted in 2018, provides a policy agenda outlining actions for agriculture that can deliver "food security, nutritional health and sustainable agricultural growth from a productive, green and



market-led agricultural sector". The NAP is aligned with several other national strategies, including NST I (and its predecessor, the Economic Development and Poverty Reduction Strategy, EDPRS), the Agriculture Gender Strategy, the Poverty Reduction Strategy, and the Green Growth and Climate Resilience Strategy. As such, the NAP centers on enabling the private sector to stimulate desirable economic gains in agricultural production. The pillars of the NAP aim to provide an enabling environment for agriculture, kickstart a technological and skills revolution, induce a productive and sustainable agricultural sector, and encompass inclusive opportunities.³² Specific policy action points provide examples of different initiatives that aim to increase incomes and resilience, improve food security and nutrition, and stimulate jobs and poverty alleviation.

Leveraging the private sector

In order to attain the Government of Rwanda's national targets and strengthen the private sector's role in Rwanda's development into a prosperous and equitable nation, in 2016 the Rwandan government enacted the public private partnership (PPP) law. The law sanctions a framework for inclusive and sustainable PPP investments; it sets the criteria for the procurement process, the selecting of locations, the role of institutions and stakeholders, and it outlines the governance structure for managing PPPs.³³ The Rwanda Development Board (RDB), MINECOFIN and, at the local level, the Local Administrative Entities Development Agency together hold responsibility for adherence to the 2016 PPP law, prepare guidelines for different stakeholders, lead negotiations for

PPP agreements, and monitor the delivery of the terms.³⁴ Before a project is legally approved, sectoral ministries, in line with policy and program priorities, must identify PPP projects, conduct feasibility studies, and note preferred organizations. Under the RDB, the Public Investment Committee and the PPP Steering Committee review and approve conditions and shortlist bidders for PPP contracts.

In 2019, the Government of Rwanda established the Leveraging Private Sector Strategy (LPSS) to attract and support private sector investment in the agricultural sector and to support the implementation of PSTA IV. The LPSS outlines the importance of bridging the national financing gap and accelerating the institutional environment in order to increase investments in agriculture; by prioritizing activities that lower capital risk, reduce contractual arrangement delays, and ensure all deals reinforce national objectives. As such, the LPSS supports PSTA IV objectives; it also encourages an increased engagement with private stakeholders across all agricultural strategies by utilizing the PPP law to stimulate further activities and initiatives. According to the LPSS, over US\$ 10 million in PPP activities and initiatives for the agricultural sector have so far been identified.³⁵

Agricultural sector digitalization

In 2016, the National Information Communication Technology for Rwandan Agriculture (ICT4Rag) Strategy was launched; it aimed to support agricultural development by facilitating the adoption and development of ICT-based agriculture in Rwanda.





A taskforce led by MINAGRI, and the Ministry of Youth and ICT (MYICT) developed the ICT4RAg Strategy to highlight Rwanda's vision for mainstreaming ICT in agriculture. The strategy outlines national priorities and a plan of action for the implementation and evaluation of over \$US 30 million worth of activities and projects.³⁶ The strategy emphasizes the importance of integrating youth into the promotion of ICT in farming; it also stresses a commitment to generating employment opportunities for women and youth.³⁷ Projects and activities seek to challenge existing shortfalls in agricultural productivity through the digitalization of knowledge sharing and technical advisory services.³⁸

PROGRAMMATIC INTERVENTIONS

Twigire Muhinzi Extension Program

In 2013, the RAB, in collaboration with district institutions, established the Twigire Muhinzi Extension Program. The program supports improving Rwandan farmers' accessibility to up-to-date knowledge, technologies, and advisory services and, in turn, farmers assume a central role in agricultural extension. The Twigire Muhinzi Extension Program operates through a system in which farmers, through farmer field schools (FFS) and farmer promoter (FP) models, are integrated into extension provision, thereby ensuring that agricultural development is driven from the bottom up. In this model, all local farmers are organized into Twigire Groups and one lead farmer from each village is trained to be a farmer promoter by farmer field school facilitators in a nearby FFS. The program encourages women and youth to take part

in local Twigire Groups by engaging with all members of the community. Over 52 percent of members are women and 17 percent of FFS facilitators are under the age of 35.³⁹ This inclusive farmer-to-farmer engagement seeks to facilitate the adaptation to and adoption of new agricultural technologies and knowledge sharing for the improvement of Twigire Group farming practices and nutrition. The FPs are responsible for ensuring that agricultural production in the village is resource efficient and improves yields.⁴⁰ Moreover, village demo plots, supervised by farmer facilitators, encourage local Twigire Groups to test new practices and apply innovative technologies firsthand. Radio marketing for increased engagement and learning, community discussions to stimulate interest and accountability in local agriculture, and the additional promotion of the Twigire program encourages the collaboration and development of smallholder agriculture and creates a motivating environment for productivity. FPs and FFS facilitators are rewarded for their participation and input into the program through lump sums and incentives.⁴¹

In 2016, an assessment of the Twigire Muhinzi Extension Program recorded the training of 2,500 FFS facilitators, 8,500 FFS groups, and 14,200 farmer promoters; it also estimated that over half of the farmers across 1.1 million Rwandan households were members of a Twigire Group.⁴² The success of the program's training and knowledge dissemination is demonstrated by a reported average 44 percent increase in crop yields for beans, cassava, maize, rice, soya, and wheat. This growth, however, was concentrated in a few villages, without which the



growth in yield was more restrained. An estimated 70 percent of farmers trained through FFSs also adopted “good agriculture practices” in crop production. Examples of these good practices that were noted since the implementation of the program include improved knowledge and better decision-making on crop diseases and pest identification, the formation of cooperatives to better access finance, the use of better seed storage for an improved next harvest, and improved knowledge on the nutritional value of soybeans. By decentralizing development to local facilitators, the program empowers local communities to improve productivity, increase livelihoods, and ensure food security.⁴³

Digital Solutions

In 2010, in collaboration with the World Bank, MINAGRI launched e-Soko, a market information system by which rural farmers are able to access up-to-date prices on over 78 commodities in 61 markets across Rwanda.⁴⁴ The data on the commodities outlines market trends and seeks to empower rural farmers and market traders to make informed decisions on pricing crops; its ultimate aim is to improve the market’s ability to provide a fair price. Mobile phones can be used to receive an SMS or voice call, or the e-Soko portal can be accessed via computer. It provides product and market information on crops such as beans, maize, rice, wheat, potatoes, and cassava.⁴⁵ MINAGRI manages the project, and local agents collect daily price information for commodities at local markets which are then recorded on the platform. In 2011, MINAGRI reported over 60,000 users of the SMS service; it also noted e-Soko’s contribution to a reduction in costs for producers and consumers as well as the stabilization of prices and the boost to agricultural investment.⁴⁶ An independent study on the usage of e-Soko in Rwanda’s Muhanga District also confirmed that farmers’ usage of this portal corresponds with increased prices, productivity, and market demand. Among users, 67 percent reported that the platform helped them identify where to market products to obtain higher selling prices, and 14 percent reported that it had increased their productivity. However, it was reported that 43 percent of farmers across the region were not aware of e-Soko and that only 27.5 percent of respondents were utilizing the service. Given the reported success but lack of uptake, the government should increase efforts to raise awareness of the benefits of e-Soko and should seek to address the challenges experienced by farmers.^{47,48}

Since the introduction of the 2016–2021 ICT4RAg Strategy, MINAGRI, in collaboration with the FAO, has released a new information system for agriculture, the Agricultural Services and Digital Inclusion in

Africa Program, which develops four apps: Cure and Feed your livestock, e-Nutrifood, Weather and Crop calendar, and AgriMarket Place.⁴⁹ The apps will be available for all Rwandan citizens and are being developed in various local languages. Leveraging the lessons learned in the implementation of e-Soko, the new program promotes the inclusion of smallholder farmers in mobile technology activities—particularly during its development—in order to improve all aspects of agricultural production, processing, and consumption. The program looks to provide various types of services, including: information on climate conditions; information on agricultural services for improved production, such as resilient crop varieties and nutrients; advisory services on livestock diseases and nutritional values; and increased connectivity to markets through accurate price information. This innovative program aims to facilitate MINAGRI’S commitment to improving access to education in agriculture for smallholder farmers and thereby reducing poverty.⁵⁰

Feeder Roads Program

In 2011, the Government of Rwanda introduced the National Feeder Roads Development Program (RFRDP) in order to increase access to rural transport facilities and thus increase farmers’ access to the market. Led by MINAGRI and the Ministry of Infrastructure (MININFRA), this program aims to provide farmers across 21 districts with access to classified, resilient, and motorable roads that enhance market access and improve rural socioeconomic development. The program is seen as a fundamental approach to achieving wider national strategies, specifically PSTA IV and Vision 2050; it is also believed to drive agricultural productivity and help achieve a reduction in on-farm employment.

An impact evaluation of the RFRDP’s upgrade to 79 km of feeder roads in Rwanda’s Rutsiro District showed that the project increased incomes, enhanced employment opportunities and skills transfers, and subsequently reduced travel time for 1,316 households in the area.⁵¹ The reduction of travel time; reducing transport costs and post-harvest losses; increasing availability of agriculture inputs such as fertilizers and machinery; and increasing access to larger markets for trade, has enhanced the agricultural economy in the Rutsiro District and is noted to have indirectly impacted other food system factors, specifically rural health and nutrition. An additional evaluation by the World Bank indicated that the program’s road rehabilitation had the largest beneficial impact on rural communities, where a 20 percent increase in incomes was observed.⁵²



Land Tenure Registration Program

Land distribution plays an important role in the development of food systems and is key to sustainable management, agricultural productivity, and security of livelihoods.⁵³ The introduction of the Land Tenure Regularization (LTR) program in Rwanda from 2004 sought to issue legal titles to every landholder in the country. The passing of the National Land Policy (NLP) and Organic Land Law (OLL) facilitated the implementation of the LTR program and provided legislation that supported the right to land for all Rwandans. The development of the NLP, OLL, and subsequently the LTR involved different ministries and development partners. The rollout of land registration between 2009 and 2013, at a cost of US\$ 70 million, clarified and documented the rights of existing landholders across all of Rwanda. Certificates were issued which validated titles for over 10 million land plots, offering land security and enabling the use of land as a transactional asset.⁵⁴ The main principle of the program was to improve livelihoods, reduce poverty, and establish social security in the aftermath of the 1994 genocide.⁵⁵ Among the cross-cutting and internationally recognized successes of Rwanda's LTR, land reform is considered central to rural agricultural development and it supports the national agenda for the commercialization of the agricultural sector, by easing agricultural investments. The World Bank considered the land consolidation exercise to be a significant contribution to increased crop yields and to the doubling of growth in the agricultural sector between 2000 to 2016.⁵⁶ Notably, MINAGRI distributes fertilizers based on certified land size data; this data is stored on their Agriculture Land Information System (ALIS). ALIS, an online database, details land size and tenure status to assist public and private stakeholders make informed and responsible investments; it also supports the implementation of initiatives and improves monitoring and management of land.⁵⁷

Sustainable Intensification of Small-Scale Agricultural Programs

To ensure that food systems significantly reduce their contribution to climate change and to help make agricultural communities more resilient to climate shocks and stresses, the Sustainable Intensification of Small-Scale Agriculture Program, implemented in 2012 under the GGCRS, seeks to institutionalize sustainable farming techniques that maximize food production; it also aims to improve the efficiency of resource use through nutrient recycling and waste and water management, and to improve soil quality through increased use of fertilizers and better pest control techniques. In particular, the sustainable pest management techniques in the program involve the introduction of napier grass and desmodium legumes

to control pests in maize crops, increase yields of current production, and improve the concentration of nitrogen soil levels. Not only do sustainable pest management techniques improve yields of staple crops, increase incomes, and enhance food security; napier grass also provides animal feed and desmodium reduces methane emissions from cattle grazing.⁵⁸ In 2018, an evaluation by MINAGRI of the GGCRS saw 48 percent of participants in the program adopting crop rotation techniques to encourage resilience to climate shocks; it also observed that 197 "plant doctors" had been trained on sustainable pest management techniques that encourage climate-resilient crop production.⁵⁹

Girinka

With support from large NGOs, MINAGRI embarked on the internationally recognized asset transfer program called Girinka. Translated as, "May you have cows", Girinka is anchored in a cultural tradition of gifting a cow to establish unity and respect. It is an important initiative that seeks to transform rural communities' livelihoods and agricultural productivity by granting one cow to every poor family.⁶⁰ Since its implementation, the RAB has distributed more than 340,000 cows across Rwanda.⁶¹ Vulnerable families are identified as program beneficiaries and receive a cow either directly or after it has been passed from family to family. Before and after families receive their cow transfer, training is given in animal husbandry, artificial insemination, animal fodder production, milk storage, and shed construction; to equip beneficiaries with the skills necessary to maximize yields, productivity, and livelihoods, and to support household nutrition. A 2012 study that surveyed 885 beneficiaries found that management training administered by the program resulted in daily milk production that was one and a half times more than when livestock transfer occurred without training. In 2017, daily average milk yield stood at 4.2 liters.^{62,63} The increase in milk production was reported to have contributed to a 132 percent increase in national milk production between 2010 and 2020. This demonstrates the importance of the program in supporting wider national, continental and global development goals to promote agriculture as a means for poverty reduction and productivity increase.⁶⁴ Furthermore, an evaluation of Girinka's impact on poverty reduction highlighted a 14 percent increase in food security, a 58 percent decrease in underweight children, and a 129 percent increase in measured income.⁶⁵ The program has also expedited Rwanda's progress in reducing wasting, stunting, and underweight among children under five.⁶⁶ MINAGRI aims to continue the success of Girinka from 2018 to 2024 and to distribute a further 189,000 cows across the country. The government will also be extending asset transfer programs to include small-stock animals



such as chickens and pigs in order to further increase resilience and the diversity of production.^{67,68}

CONCLUSION

Thanks to forward-thinking institutional frameworks, policies, and programmatic interventions that are seeking to challenge adversity, Rwanda offers exemplary experiences and visionary leadership for the successful transformation of its food systems. Importantly, the government is now explicitly adopting a “food systems approach” across agricultural objectives and is clearly acknowledging the need to facilitate institutional coordination in addressing the multifaceted nature of interventions. The eminent attention on sustaining ‘green growth’ entwined throughout activities, clearly demonstrates its contribution to combatting the environmental challenges confronted in Rwanda’s food systems and the government’s commitment to seizing the opportunities arising from green-led investments into agriculture. Most notably, collaboration with a diverse range of cross-sectoral stakeholders in the development and implementation of state initiatives ensures success in achieving inclusive, tailor-made, and context-specific solutions. There is, nevertheless, a need to strengthen independent evaluations of Rwanda’s agricultural transformation in order to draw comprehensive lessons for the scaling up and scaling out of interventions across the continent.

While Rwanda has taken great strides in recognizing the complexity of food systems, several opportunities exist to combat existing challenges and to leverage sustained development. Rwanda can further magnify efforts to eliminate hunger and malnutrition through

targeted initiatives that address food systems in the context of both food production and consumption. Demand- and supply-side interventions are essential to addressing the underlying causes of nutrition deficiencies such as lack of dietary diversity. In addition to nutrition education, production diversity with appropriate financial support will contribute significantly to dietary diversity. For the most vulnerable, poor, and food-insecure households in rural areas, social safety nets and alternative livelihood programs offer vital and stable sources of income to support sufficient and healthy diets. Moreover, strengthening downstream activities within value chains—including processing and marketing—would also have a significant “pull” effect on upstream production and productivity. Rural food markets, in particular, offer win-win outcomes as they support both agricultural growth and dietary diversity and hence an overall food systems transformation. They in turn require extensive interventions to improve energy, water, and hard infrastructure, so as to improve sanitary consumption and regulate food safety. Despite the strengths in facilitating private sector investments, more attention needs to be paid to funding the development of Rwanda’s agro-processing subsector in order to improve resource utilization in production and the quality of food products for consumption. Importantly, while Rwanda has built a robust institutional framework for inclusive policy-making, the implementation of initiatives must include the clear communication of activities so as to ensure coordination and alignment between stakeholders. In this way, the benefits of a successful food systems transformation will be fully harnessed.





ENDNOTES

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