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Innovation Policy & Strategy

Rwanda: A Case Study on how GKI Supports Science, Technology, & Innovation Ecosystems

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INTRODUCTION

Rwanda: A Case Study on GKI's Innovation Policy & Strategy Practice

Among developing countries on the African continent, Rwanda stands as a unique example of what is possible when policy and strategy align. It is a country simultaneously recovering from conflict, while growing economically at a breakneck annual growth rate of 8% in terms of GDP per capita.   Rwanda's largely agriculture-driven economy is fueled by investments in human capital, infrastructure, and technology that signal a shift toward manufacturing and services, and a commitment to achieving middle-income country status by 2020. Against this dynamic backdrop, in 2013 and 2014 the Global Knowledge Initiative (GKI) had the unique experience of contributing to three catalytic policy and strategy documents. The combination of these three experiences illustrates the creativity and impact of GKI's policy and strategy practice. For each of these three instances, this document highlights the goals, methods, and results achieved by GKI. It showcases both (1) how GKI helped Rwanda increase the effectiveness of its science, technology and innovation (STI) policies, and (2) how GKI's strategic design tools offer unmatched value and impact in policy articulation, review, and implementation.

The Global Knowledge Initiative was founded to help problem solvers—individuals, institutions, countries—grapple with development challenges related to science, technology, and innovation. Though these challenges are diverse, ranging from agricultural productivity to environmental resilience, they each beckon for robust enabling environments in which innovation flourishes and delivers solutions. Key to a robust ecosystem that encourages the production and application of innovative solutions are policies and strategies that support innovation. Since 2009, GKI has worked to help governments and a host of key stakeholders improve the effectiveness and impact of such policies designed to boost economic and social development through science, technology, and innovation.

From Reviewing a Policy to Setting a Trajectory

In 2005 Rwanda published its first National Science, Technology and Innovation Policy, committing the government to building a knowledge economy and using STI to drive economic and social opportunity. In the years since, Rwanda has invested billions of francs in building capacity, investing in infrastructure, connecting cities, and spurring other STI-related activities. Seven years after creating the STI Policy, the Government sought to assess how effective the policy had been in achieving its goals. The United Nations Economic Commission for Africa (UNECA) agreed to help Rwanda analyze the policy's effectiveness and hired the Global Knowledge Initiative to undertake a formal STI Policy review. Within a year of completing this analysis, GKI would also have the opportunity to write the National STI Implementation Strategy for the resultant updated STI Policy. Finally, because of the caliber of its work and depth of insight into the nuance of developing country innovation systems, GKI was selected to facilitate the articulation of the institutional strategy for the nascent National Commission of Science and Technology, chaired by the Prime Minister.

In the course of completing these activities, GKI had the opportunity to ask and answer a number of key questions familiar to countries aspiring to establish and enhance their innovation ecosystems:

Questions we asked in the course of our STI policy and strategy work:

(1) To what extent has its National Science, Technology and Innovation Policy moved Rwanda toward its goal of becoming a middle-income country by 2020?

(2) How might we implement an updated National STI Policy for maximum impact?

(3) How might a new cross-ministerial commission coordinate STI nationally?

The manner in which GKI answered these questions sets us apart from other organizations supporting STI-based development. The three, interconnected perspectives described below influence the way we conduct our work, and allow our policy and strategy practice to deliver value for our partners.

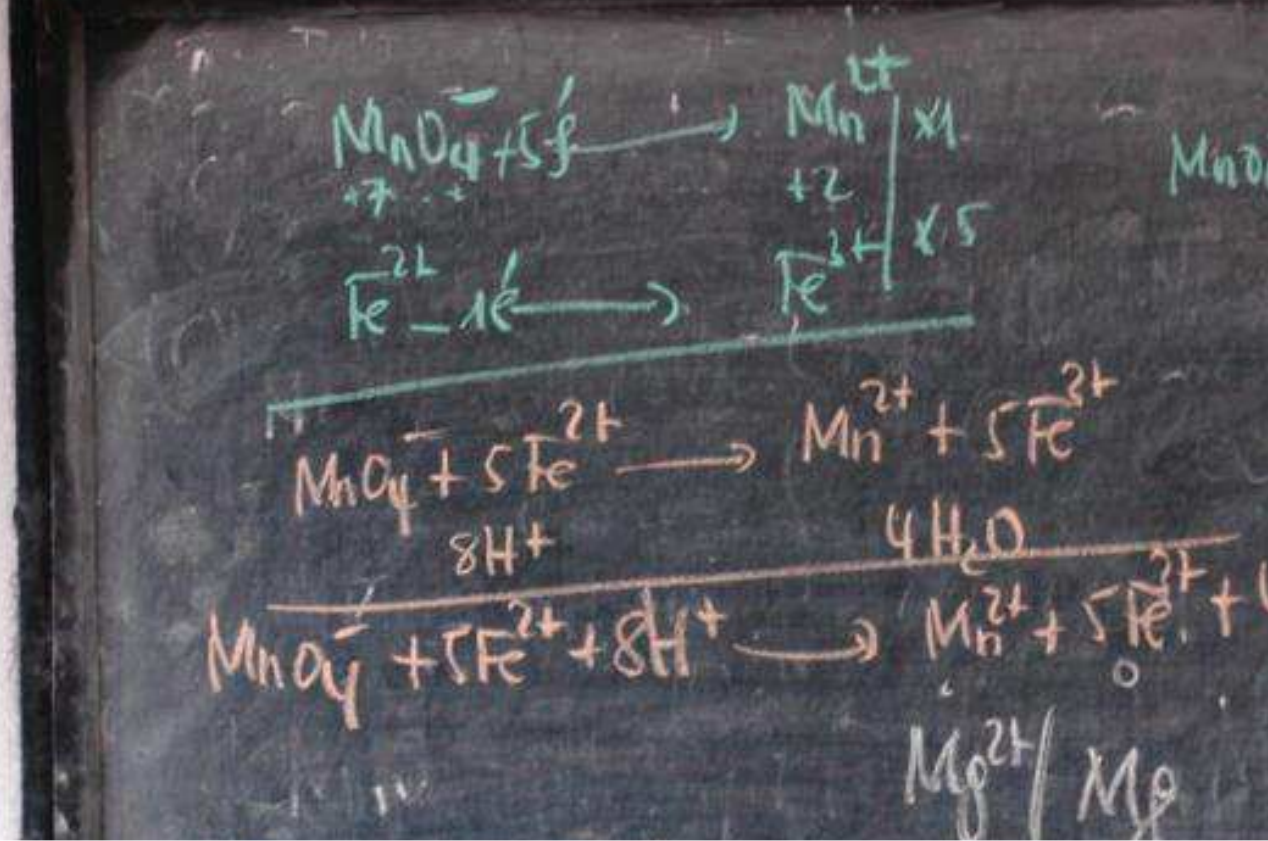| Design Principle #1: **Participatory approach**	Design Principle #2: **Innovation systems perspective**	Design Principle #3: **Human-centered design**
Throughout GKI's work, we push for and value radical inclusivity. In the case of STI policy and strategy work, beyond reaching stakeholders who work in diverse and distinct STI sectors, this means touching individuals not often included in STI decision-making: construction workers, cooks, small business owners, and others who benefit from investments in STI. These individuals' perspectives provide insight on the benefits of and challenges to STI priorities otherwise unavailable.	Innovation does not occur in a vacuum: rather, forces across an economy enable or stifle innovation. Our approach focuses not just on policies and strategies, but also on the enabling environment within which they exist, the actors that work within the system, the interactions between those actors, and the system's outputs and outcomes. This focus allows us to readily identify opportunities for positive change and foresee potential challenges.	Solving problems in complex systems requires innovative methods that allow analysis of challenges from new perspectives. Human-centered design (HCD) provides a starting point by encouraging us to take a beginner's mindset in problem solving, and to empathize with the perspectives of individuals across an innovation system. First tested and tried in Silicon Valley for product design, HCD can greatly improve the relevance of policy and strategy as well.

The following pages offer an overview of GKI's innovation policy and strategy activities, highlighting those we undertook with the Government of Rwanda and UNECA to boost the effectiveness of STI's contribution to socio-economic development in that country.

Reviewing Rwanda's National Science, Technology, & Innovation Policy

INQUIRY: To what extent has Rwanda's National STI policy moved Rwanda toward its goal of becoming a middle-income country by 2020?

Eight years after adopting Rwanda's National Science, Technology and Innovation Policy in 2005, Rwanda's Ministry of Education recognized the need to evaluate how the policy objectives had been implemented on the ground in Rwanda, and identify any successes or gaps in the implementation. Rwanda's STI Policy was designed to harness STI to boost economic growth and to help overcome challenges that cut across economic sectors and aspects of society. Its broad goal was to support the achievement of the national development blueprint—Vision 2020—and its target of Rwanda becoming a middle-income country by 2020. Had implementation of the STI Policy put Rwanda on a track toward reaching its goal? Or had the country faltered on those activities envisaged almost a decade prior as instrumental in cultivating an innovation culture and focusing the country on generating, applying, and transferring the knowledge necessary for STI-fueled growth. To answer these and other questions, GKI worked with the Ministry of Education and UNECA through a process of analytic research, stakeholder interviews and surveys, workshops, and facilitated meetings to deliver qualitative answers to these questions. The questions and tools described below provide insight into how we undertook the National STI Policy Review.

What metrics best capture STI's influence in driving economic and sectoral growth?

Goal: While Rwanda's 2005 STI Policy neither set a baseline nor measurable targets, the Government was still keen to find out what progress had been made as a result of the policy. GKI developed a set of 12 proxy indicators to meet this request and spur debate about selection of proper metrics to capture STI's influence going forward.

Method: Through interviews and secondary research, GKI selected 12 indicators across four pillars: knowledge acquisition, knowledge creation, knowledge transfer, and innovation culture. GKI then compared the status of those indicators in the year the policy was implemented to the present.

Results: Indicators provided a picture of how robust targets and measurement methods could allow for both visionary goals and outcome-based program improvements.

How do diverse stakeholders' perspectives illuminate the full scope of STI needs?

Goal: To get a full picture of how STI was (or was not) helping Rwanda become a middle-income country, it was vital to go beyond the usual suspects for interviews in government and industry.

Method: GKI worked to be radically inclusive in its inquiry, incorporating stakeholders from industry and government, as well as farmers, teachers, and construction workers. Undertaking surveys and soliciting interviews and direct feedback from 178 individuals served as methods for inclusion. Both the scope—including numerous participants and sectors—and the varied methods of analysis proved inclusive.

Results: Through including a broad spectrum of interviewees and meeting attendees, GKI was able to surface important insights on Rwanda's needs for STI. These insights provided the fodder for the main critiques and suggestions for enhancements to the STI Policy.

What international and domestic forces affect STI and development most significantly?

Goal: To understand STI and its role advancing Rwanda toward economic and social goals, it was vital to position STI in a broader context of domestic and international driving forces and potential game changers that shape its future.

Method: GKI used secondary research to identify key drivers and questions on the horizon for STI in Rwanda. The drivers represent trends significant to socio-economic development, while the questions on the horizon represent uncertainties that bear on the future of STI in Rwanda, and thus the degree of success of policy reforms.

Results: Rwanda's updated STI Policy responds both to internal needs and external realities. It clearly takes into account the drivers of economic growth and the uncertainties that must be acknowledged and dealt with in advancing policy recommendations looking forward.

Notional STI Policy Indicators

Interviews and Convenings

Key Drivers & Questions on the Horizon

Developing the Implementation Strategy for an updated National STI Policy

INQUIRY: How might we implement an updated National STI Policy for maximum impact?

GKI's review of Rwanda's National Science, Technology and Innovation Policy yielded a number of recommendations, ranging from the need to streamline policy priorities to a call to remove administrative barriers to knowledge creation. These recommendations highlighted the need for an updated STI Policy and the construction of an actionable Implementation Strategy to better ensure the strategic use of resources and continued progress toward policy goals. After making updates to the policy based on GKI's review, the Global Knowledge Initiative again partnered with the Ministry of Education and UNECA to engage stakeholders across Rwanda's innovation system to develop ambitious, but achievable, steps that could be taken to implement the updated National STI Policy. GKI crafted the implementation strategy through a multi-stage, inclusive process, which included a range of sectoral clusters dispersed throughout the country. Emphasizing continual multi-stakeholder engagement, GKI helped the STI community articulate performance goals; targets for near-term, mid-term, and long-term achievement; incentives; and even the governance structures required to ensure implementation.

What are the critical STI functions essential for achieving national development goals?

Goal: To optimize the impact of STI in Rwanda, GKI sought to understand what broad functions must be served across sectors to realize the goals of the STI Policy. Specifically, it was important to derive a system of functional pillars that would offer coherence and support action across the many sectors, institutions, and actors that compose Rwanda's innovation system.

Method: These broad functional pillars, which range from coordinating STI efforts to cultivating an innovation mindset, were developed by mining national development policies and sectoral policies, analyzing the feedback of 20 working groups that completed questionnaires on priorities, and through facilitated sessions with innovation leaders.

Results: Innovation System leaders and other stakeholders have validated the functional pillars used in the Implementation Strategy as representing critical STI functions.

What STI activities are feasible, necessary, and catalytic for growth and development?

Goal: GKI worked to identify steps that must be taken to meet the goals set within each functional pillar. By specifying the chief activities to be taken, Rwanda can focus its time, energy, and funding on those activities that definitively propel industry, government, and civil society toward their goals.

Method: Facilitation and secondary analysis provided the insights needed to design performance goals. These performance goals oriented activity design. Taking the insights of stakeholder working groups and combining them with activities suggested by both policy documents and in facilitated sessions, GKI developed priority actions to support each performance goal.

Results: 24 performance goals provide broad, but measurable, goal posts for action. Ensuring accountability and measurability are a list of priority actions and key actors supporting these goals, and indicators of success in meeting performance goals.

What indicators can help us tell the story of STI progress year after year?

Goal: To guide policy makers and implementers in implementing the updated National STI Policy, it was necessary to develop a set of indicators to guide monitoring and evaluation. These indicators needed to serve three levels of analysis: 1) the level of the national system of innovation, 2) the level of performance goals, and 3) on the level of discrete activities.

Method: Using three guiding questions—Do we have the necessary human capital? Do we have sufficient investment in STI? What outcomes are elicited from investment in STI?—GKI identified 10 indicators to track. Further, a set of qualitative and quantitative indicators were developed to match performance goals and performance actions.

Results: The STI Policy now has a succinct system-wide Outcomes Dashboard as well as a detailed log frame that tracks large trends, broad action areas, and specific activities.

Functional Pillars

Performance Goals

Outcomes Dashboard

Articulating the National Commission of Science and Technology 5-year Strategic Plan

INQUIRY: How might a new cross-ministerial commission coordinate STI nationally?

In 2013, The Rwandan Cabinet enacted a law establishing the National Commission of Science and Technology (NCST). With an emphasis on building human capacity in STI, NCST exists to advise on and coordinate the effective use of science, technology and innovation as key ingredients to propel Rwanda's development. Chaired by the Prime Minister and with the Minister of Education and Minister of Trade and Industry serving as dual vice-chairs, the National Commission includes high level representation from industry, university, and civil society, making it similar in structure and ambition to cross-ministerial commissions in Finland and Malaysia. As Rwanda's NCST navigates the early phases of its operations, it is critical that the Commission develops a clear vision and defines programming and targets strategically. To this end, NCST's Director General chose to design a Five Year Strategic Plan to set a vision for the institution and identify priority programs and targets over the coming years. In 2014 the Office of the Prime Minister partnered with the GKI to support NCST in elaborating this inaugural Five Year Strategic Plan. The strategic plan addresses how NCST can coordinate STI, focusing specifically on answering the questions below.

What opportunities and threats face STI in Rwanda that the Commission should respond to?

Goal: As NCST initiates its role coordinating STI in Rwanda, a top priority is to seize strategic opportunities for national growth and transformation, while also mitigating threats. Analyzing opportunities (e.g., regional economic integration) and threats in relation to priority sector needs sheds light on activities NCST can prioritize.

Method: GKI used a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis to identify the external opportunities and risks that might affect STI-driven development in Rwanda's future. After an exploration of four possible futures, GKI analyzed the implication of these futures on STI governance and the optimal role played by NCST.

Results: NCST's Strategic Plan is attuned to opportunities and threats facing Rwanda in the coming years, enhancing its relevance in a dynamic context. Specifically, activities undertaken by NCST are oriented to mitigating threats and seizing opportunities.

What structures best link policy, industry, academia, and civil society?

Goal: Coordinating STI at the national level requires linking policymakers, industry, academics, representatives of civil society, and others in productive partnerships or networks. GKI and NCST sought to understand what structures would best lend themselves to creating and sustaining such linkages, and ensuring that STI partnerships produce impact.

Method: In the course of an intensive facilitated meeting with the NCST team in Kigali, GKI used a design tool called Strategy Shaping to explore how actors across the innovation system could work together—and with NCST—to implement STI-related programs. This iterative system planning and visualization tool helped teams identify specific actions that NCST could take in coordinating STI across economic sectors in Rwanda.

Results: Structures and roles defined in the Strategic Plan ensure effective coordination of the diverse actors working in Rwanda's economy.

How can the promise of emerging advances in STI align to sectoral needs?

Goal: From agriculture and animal husbandry to energy generation and distribution, each economic sector has specific STI needs that must be met to ensure long-term growth. NCST seeks to understand how the role of the Commission can aid and coordinate STI in and across different industrial sectors, keeping pace with emerging research and innovation advances globally.

Method: Through in-person interviews with stakeholders from priority sectors and background research, GKI identified and mapped specific STI needs to sectors, while also highlighting those needs that were voiced across multiple sectors.

Results: Sectors will receive demand-driven services from NCST. NCST's Strategic Plan rests on services requested by representatives of priority sectors. Mechanisms for trendspotting are built into the priority actions of the Commission.

SWOT Analysis

Strategy Shaping

Sectoral Needs Map

Engaging GKI on STI Policy and Strategy

The Global Knowledge Initiative recognizes that without a strong enabling environment for STI, efforts to promote economic development and develop solutions to complex problems will fail to reach long-term impact. Essential to the ability of countries and regions to solve challenges through STI is the development of viable innovation systems characterized by sound STI policies, institutional frameworks, and investment strategies. For these reasons, GKI offers a range of support to national governments, donor institutions, research institutions, networks and other entities aiming to strengthen STI policy and strategy in countries across Sub-Saharan Africa, Southeast Asia, and beyond. We welcome the opportunity to work with you and your constituents to design policy instruments that meet your needs, and maximize the outcomes you seek to deliver.

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