

The Gambia TNA Summary 2019

Overview

The Gambia, a small West African nation with a mainly rural and rapidly growing population of nearly 2.4 million, relies on agriculture, services, and tourism while remaining heavily dependent on international aid for development and debt servicing. Poverty, infrastructure deficits, low productivity, and climate vulnerability continue to hinder economic diversification and growth. To address these challenges, the government prioritized science, technology, and innovation (STI) as key drivers of economic transformation and resilience. Despite limited R&D investment, The National Development Plan (2018-2021) and STI Roadmap 2030 set ambitious goals to strengthen human capital, infrastructure, and innovation for sustainable growth, with agriculture, energy, ICT, and research as key priorities. The total GDP consists of the agriculture, forestry and fishing, services and industry sectors, along with 10% of the GDP representing smaller sectors.

Agriculture, Forestry & Fishing

19% of GDP (down from 31% in 2009)

Industry

15% of GDP (peaked at 20% in 2016)

Services

56% of GDP (up from 51% in 2009), including tourism

Priority Technology Needs

The Gambia faces significant technological gaps across key sectors, which hinder economic growth and sustainable development. These gaps are particularly pronounced in agriculture, energy, healthcare, education, and environmental conservation, where outdated technologies, limited infrastructure, and insufficient capacity constrain progress. Addressing these challenges requires targeted investments in technology adoption, capacity building, and infrastructure development. A strategic focus on innovation and digital transformation can help bridge these gaps, enabling the country to achieve its development goals. The following sectors highlight the primary technology needs and challenges, emphasizing the importance of tailored solutions to drive inclusive and sustainable growth.



Agriculture

Agriculture remains vital to The Gambia but faces challenges such as low productivity, outdated techniques, post-harvest losses, and climate vulnerability. With 98% of farmland rain-fed, yields fluctuate by up to 100% annually, making smart irrigation, climate-resilient crops, and precision farming essential. Drip and sprinkler irrigation can optimize water use, while modern storage, drying, and vacuum packing help reduce post-harvest losses. Rainwater harvesting, water treatment, and climate forecasting can enhance resilience, alongside coastal protection measures to prevent land degradation. Expanding drought- and flood-tolerant crop varieties will further strengthen climate adaptation. Climate monitoring and forecasting technologies can provide farmers with timely, reliable information, while bio-fertilizer use, and sustainable land management can further boost productivity and food security.



Energy

Energy is a critical priority in The Gambia, with rising demand and limited access, particularly in rural areas. The country remains heavily reliant on imported fossil fuels, making energy security a key concern. Expanding renewable energy solutions, such as solar, wind, and bioenergy, is essential to reducing dependence on imports. Smart grids and microgrid technologies can improve electricity distribution and integrate renewables, while digitalization through smart meters and automated monitoring enhances efficiency. Investing in waste-to-energy solutions and climate-resilient infrastructure can further support sustainable power generation and long-term energy security.



Healthcare

The Gambia faces serious service delivery challenges, especially in rural areas with limited medical facilities and trained staff. Telemedicine and virtual consultations can bridge gaps, while mobile diagnostics and portable imaging improve early detection. E-pharmacy systems and digital health records enhance medication access and patient management. AI-driven diagnostics and capacity-building programs for healthcare workers are needed to improve disease surveillance and decision-making, while remote monitoring can support chronic disease care. Solar-powered clinics and mobile health units can expand access in off-grid areas.



Education

The Gambia faces limited digital infrastructure, insufficient learning tools, low STEM participation, and vocational training gaps. Expanding e-learning platforms, internet access, and digital devices in rural schools is needed to bridge these gaps. Strengthening TVET programs in STEM, AI-powered learning tools, virtual labs, and mobile or radio/TV-based education can enhance accessibility and workforce readiness. Teacher training in digital literacy and localized digital content are also needed to improve education quality and align skills with labor market needs.



Environment and Conservation

Deforestation, biodiversity loss, and climate risks threatening sustainable development are key concerns for the country. Satellite imaging, IoT sensors, and GIS mapping are needed to track land use changes and ecosystem degradation, while climate monitoring and early warning systems are needed for disaster preparedness and building resilience to extreme weather events. Smart water management technologies, including rainwater harvesting and water treatment are also needed. Expanding waste-to-energy and composting systems can help reduce pollution and support renewable energy.

A coordinated, multi-sectoral approach integrating innovation, capacity building, and infrastructure development is essential to meeting The Gambia's technology needs. Prioritizing renewable energy, digital education, telemedicine, smart agriculture, and ICT expansion will help bridge urban-rural disparities, strengthen climate resilience, and drive economic diversification. Effective collaboration between government, the private sector, and international organizations is crucial for mobilizing resources and expertise. Additionally, fostering a culture of innovation, expanding research capacity, and investing in human capital will ensure that technological advancements are both sustainable and inclusive. With strategic STI investments and strong policy support, The Gambia can unlock long-term prosperity, economic stability, and environmental sustainability.

Country Context & Science, Technology, and Innovation Landscape

Guided by the National Development Plan (2018-2021) and STI Roadmap 2030, The Gambia seeks to diversify its economy, enhance climate resilience, and develop a skilled workforce by leveraging science, technology, and innovation (STI) to address key development challenges. **Renewable energy, digital infrastructure, smart agriculture, and technical education are central to this strategy, serving as key drivers of growth.** The government's commitment to innovation-led development is evident in its efforts to strengthen STI governance, increase R&D investment, and expand STEM vocational training. With targeted investments and strong policy support, The Gambia is laying the foundation for sustainable growth and technological progress.

Human Development Index (HDI) Rank in 2018: 177/189 (UNDP, 2018)

2,1 million
Population
(WB, 2018)

~63%
Youth <25
(2013)

6.6%
GDP Growth
(2018)

\$2,570
GNI per capita (PPP)
(2018)

48%
Urbanization
(WB, 2018)

27%
Tertiary Enrollment
(2018)

Frontier Technology Readiness Index (FTRI) Rank: 162/167 (UNCTAD, 2019)

19.7%
Internet Penetration
(2017)

0.017% of GDP
R&D Expenditure
(2018)

\$52^B
FDI Inflow
(UNCTAD, 2018)

60.3%
Access to Electricity
(WB, 2018)

30.9
PCI
(UNCTAD, 2018)

35%
Financial Inclusion
(WB, 2018)

The STI landscape in The Gambia is marked by low R&D expenditure, at just 0.017% of GDP, well below the African Union's 1% target. This underinvestment limits the country's ability to address socio-economic challenges through innovation. The private sector's contribution to R&D is minimal, with most research funded by international organizations like the Medical Research Council Unit, creating dependency on external support. The education system struggles to produce enough STEM graduates, with low levels of tertiary enrollment and limited technical training. **Brain drain further exacerbates the shortage of skilled professionals.** However, opportunities exist in digital transformation and renewable energy, aligning with global trends and national priorities.

A major challenge is the lack of a centralized STI governance body, leading to fragmented policy implementation and overlapping roles among ministries. Infrastructure deficits, particularly in research facilities and digital connectivity, further hinder progress. **Limited internet access in rural areas restricts the adoption of digital tools, while reliance on international funding ties projects to donor agendas rather than local needs.** Despite these issues, the presence of institutions like the Medical Research Council Unit offers opportunities for collaboration and knowledge transfer, particularly in healthcare, agriculture, and environmental conservation.

The Gambia has significant potential to leverage STI for sustainable development, with growing emphasis on digital transformation, renewable energy, and climate resilience. Policies like the *Gambia ICT for Development Policy (2018-2028)* and the *National Climate Change Policy* provide a strong foundation for innovation-led growth. Strengthening partnerships with international organizations, mobilizing the diaspora, and investing in human capital through STEM education and vocational training are critical steps. By addressing these priorities, The Gambia can unlock its STI potential, enhance economic resilience, and position itself as a regional leader in sustainable development.

Key Recommendations

- Establish a National STI Coordination Body to streamline policies and avoid fragmentation and develop a national STI funding agency.
- Boost government and private sector contributions to reduce dependence on international funding.
- Provide fiscal incentives and funding mechanisms for high-tech start-ups and innovation projects.
- Expand STEM education, vocational training, and incentives to retain skilled professionals.
- Strengthen research capacity through scholarships, training programs, and international collaboration.
- Invest in research facilities, laboratories, and quality assurance systems.
- Expand internet access and digital infrastructure to bridge urban-rural divides.
- Strengthen partnerships with international organizations and encourage private sector engagement.
- Promote renewable energy, climate resilience, digital transformation, and support agriculture modernization through STI-driven solutions.
- Engage Gambian experts and diaspora abroad to contribute to local research, innovation funding.
- Develop a data-driven STI policy framework with clear targets and evaluation mechanisms and strengthen regulatory frameworks to align with international standards.