



# Science, Technology & Innovation Policy Review

Ghana

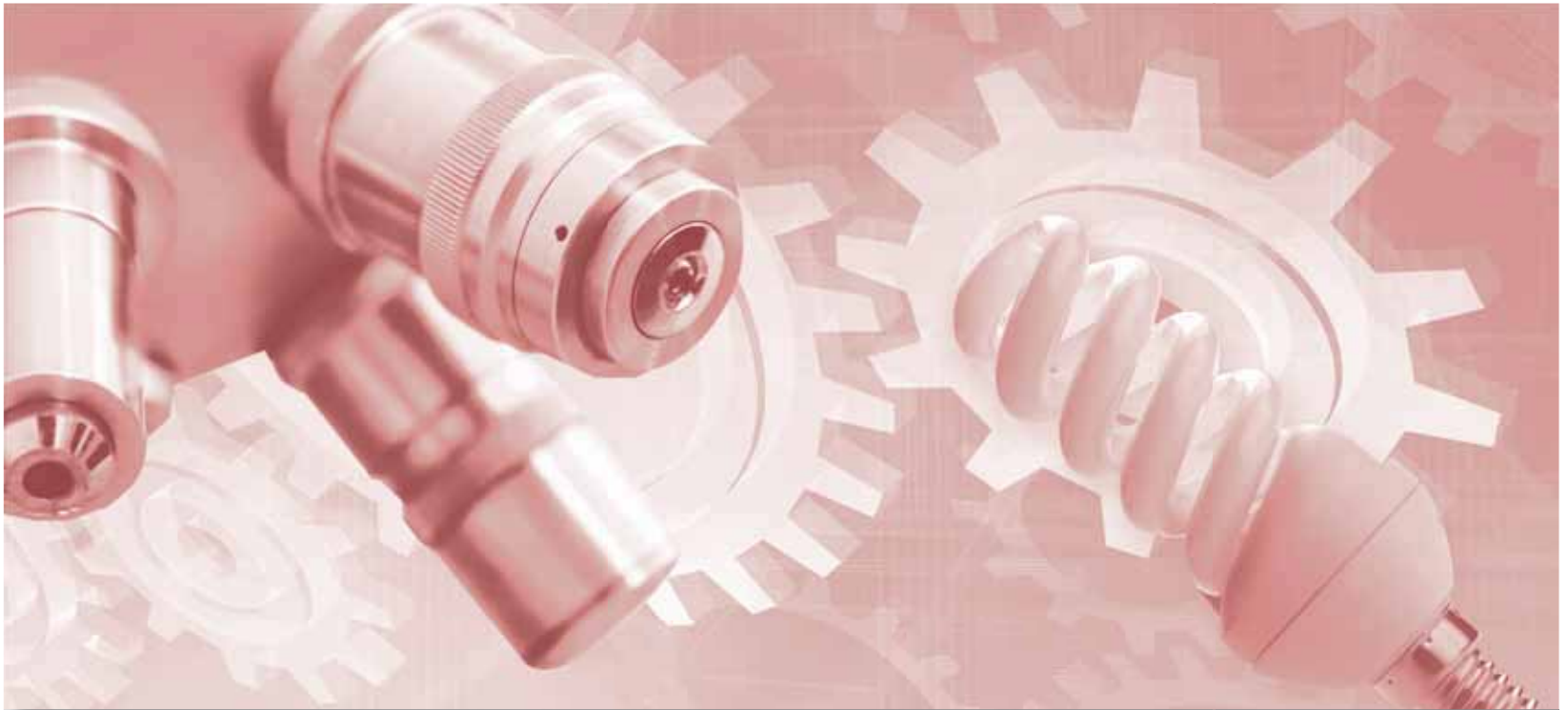


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## FOREWORD

It is a time of renewed promise in Ghana. Steady economic growth throughout the past decade and the recent discovery of oil have raised hopes that Ghana is on track to join the ranks of the lower middle-income countries. The country is also making progress towards meeting many of its Millennium Development Goals.

But continued growth cannot be taken for granted. Long-standing challenges in Ghana include diversifying the economy beyond traditional exports such as gold, cocoa and timber. New sources of income from the oil and gas industry are welcome, but intensified specialization in natural resources production could affect the competitiveness of Ghana's other industries. This could undermine progress towards building dynamic competitive advantages in more knowledge- and technology-intensive activities. These risks make it very important to have public policies in place that help raise productivity in non-oil industries, build productive capacity, and promote economic diversification and structural change.

Ghana's Government has therefore renewed its commitment to harnessing science, technology and innovation (STI) to help meet its economic, social and environmental challenges and to promote inclusive and sustainable growth and development. As part of this commitment, a new national STI Policy was launched in March 2010 under the leadership of the Ministry of Environment, Science and Technology. The policy was prepared in a consultative manner, with expertise from the country's scientific, academic and business communities, and with attention to the views of Ghanaian citizens. Lessons from Ghana's past, and from the experiences of countries around the world, have been taken on board. The policy envisions a promising future for Ghana that builds on abundant modern advances in science, technology and innovation.

What matters now is how well this STI Policy is integrated into Ghana's national development strategy and translated into actions that will improve the quality of life for all Ghanaians in a sustained manner. Success would be reflected in better healthcare for the people, innovations to make Ghana's businesses more productive, the modernization of farming and agribusiness, and an improved ability to address the challenges of climate change. This report reviews Ghana's STI policies and is part of the Government's efforts to ensure that policy is supported by practical programmes. Initiated at the request of the Government, and prepared by a team of Ghanaian and international experts, the Review presents recommendations on measures to reform and strengthen Ghana's STI system.

The Review finds that many of the building blocks for fostering innovation and technological development – including reputable universities, research institutes, and a growing private sector – are already in place in Ghana. However, the STI system does not focus sharply enough on Ghana's socio-economic needs. Existing STI support programmes for the private sector do not appear to be encouraging technological upgrading or innovation. Resources are spread thinly across the system, and as a result, many of the country's important STI institutions are unable to effectively carry out their mandates. Funding allocations for STI are determined by the Government and donor programmes and often do not relate to the priorities of research institutes and universities, and much less to those of the private sector, farmers and informal enterprises.

The recommendations presented in the Review are centred on four main themes: (a) improving the leadership, coordination and management of STI; (b) developing programmes that encourage innovation and technology adoption by the private sector; (c) growing the science, engineering and technical workforce; and (d) creating incentives to align the public technology providers with the needs of the private sector. With the support of the World Bank and UNCTAD, the Government will work towards implementing these recommendations.

Additional partners will be needed to ensure a sustainable and successful effort at STI development. As the production of knowledge and technology becomes increasingly global and interconnected, Ghana must build strong partnerships with governments and organizations around the world. Universities in Ghana need to establish new connections with universities in countries such as Brazil, India, the Republic of Korea, and

Viet Nam, in addition to strengthening existing partnerships with the United States and European countries. Entrepreneurs, scientists and engineers in Ghana must learn from – and share their own expertise with – their counterparts across West Africa and the world.

The spirit of cooperation underpinning the STI policy review process represents a constructive way forward for Ghana as it seeks to strengthen its development agenda by incorporating science, technology and innovation. This is an important step towards building human capital in Ghana and preparing the country for economic growth in the Africa of the twenty-first century. The Government of Ghana, the World Bank and UNCTAD are committed to working together on implementation of Ghana's STI Policy.

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of UNCTAD

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Science and Technology  
Ghana

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## PREFACE

The Government of Ghana has ambitious plans for the country. On the back of strong economic growth throughout the past decade, it aims to graduate from low- to middle- income status in the next decade. To achieve this aim, economic growth will have to accelerate and productivity will need to rise. Achieving this ambitious goal will necessarily involve, among other things, a more effective application of science, technology and innovation (STI) in the economy in order to drive productivity growth and diversification in production. To date, however, the role played by STI in Ghana's development has been limited.

The Science, Technology and Innovation Policy (STIP) Review of Ghana was prepared at the request of the Government of Ghana. The Review is meant to offer an objective and critical look at the country's STI capacities and assess how these capacities are being translated into innovations that help meet the country's socio-economic development objectives, including supporting economic growth and poverty reduction as well as structural transformation of the economy. It sets out specific recommendations for practical actions and policy reforms to build STI capacity and to create a more dynamic economy that will move more quickly towards middle-income levels. The Review argues that policy action to promote STI development is required if Ghana is to achieve faster, more sustainable growth and development.

The Review has two parts. Part I is an overview of the full report that lays out the challenges that Ghana faces, and it summarizes the findings of the report. It is based on five background studies, which are presented in Part II of the Review. The two annexes provide a summary table of the recommendations of the Review and a brief summary of the African policy environment for STI-based development.

Part II contains the five background studies that were prepared for the Review. The topics were selected by a committee of Ghanaian stakeholders from science, academia, business and government at the outset of the STIP review process, in line with national priorities.

The first study (chapter 2) profiles the organizations, institutions, policies and linkages that characterize Ghana's national innovation system. The focus is on the overall strengths and weaknesses of the system and on the policy regime and institutional arrangements that Ghana needs in order to build a dynamic system of innovation.

The second study (chapter 3) looks at the performance of the research and development system, which has historically received the bulk of Ghana's STI investments and is a critical component in the innovation system.

Two studies focus on the role played by STI in particular industries of the economy: food and agro-processing (chapter 4) and traditional and herbal medicine (chapter 5). Modernizing agriculture is key, both because the majority of the population lives off it and because such a process will open up opportunities to change the relationship between agriculture and industry. Traditional and herbal medicine is an industry that may offer potential for economic gain, as well as contributing to improving the health of Ghanaians.

The fifth study (chapter 6) looks at the potential that information and communication technologies (ICTs) offer to transform education in Ghana. It focuses on providing access to education services and improving the quality of these services, so that Ghana's human capital can better contribute to achieving Ghana's vision of a modern economy more heavily based on the successful application of science and technology to production.

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## ACKNOWLEDGEMENTS

The STIP Review of Ghana was prepared jointly by UNCTAD and the World Bank in collaboration with the Science and Technology Policy Research Institute (STEPRI) of Ghana's Council on Scientific and Industrial Research, at the request of the Government of Ghana. The Review was prepared by a team including Michael Lim (UNCTAD), Michael Ehst (World Bank) and George Essegbey (CSIR-STEPRI), with overall guidance on the project provided by Mongi Hamdi (UNCTAD) and Alfred Watkins (World Bank). Officials at the Ministry of Environment, Science and Technology (MEST) (formerly the Ministry of Education, Science and Sports) were the main counterparts within the Government of Ghana. Contributions of background reports were provided by teams of experts including John Mugabe (Ghana's STI framework and national innovation system), Jo Lorentzen (Ghana's research and development system), Syed Rizvi, Michael Ehst, George Essegbey and Jonathan Agwe (science, technology and innovation-based development of food and agro processing), Kathryn Stokes (innovation in traditional herbal medicines) and Farouk Kamoun (ICTs in Ghana's education system). The Review benefited greatly from comments and suggestions provided by Kofi Agyen, Michael Crawford, Peter Darvas, Ishac Diwan, Mark Dutz, Angel González Sanz, Kurt Larsen, Anne Miroux, Kofi Tsikata and Michel Welmond.

Many people in Ghana, including government officials, university and research institute staff, private-sector representatives, development partner and civil society staff, and others gave generously of their time and insights to the research teams preparing each of the background papers. All of these contributors are gratefully acknowledged.

The STIP Review would not have been possible without collaboration at every stage by STEPRI. STEPRI's research team and support staff, and its director, Dr. George Essegbey, were all deeply committed to the project and deserve special recognition.

The Review was edited by Daniel Sanderson and Lucy Deleze-Black. It was desktop published by Monica Morrica and Philippe Terrigeol. The graphics and tables were prepared by Laurence Duchemin. The cover was designed by Nadège Hadjemian.

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