



ABOUT THIS BOOK

Science, Technology, and Innovation for Socio-economic Development: Success Stories from Africa emphasizes the importance of science, technology, and innovation for the African continent, and for the attainment of the Millennium Development Goals by 2015. It aims to promote the continent's science education and research, and to showcase its contribution to the development of science and technology in the world, especially to the participants of the 29th ICSU General Assembly in Maputo in October 2008. This volume brings together, under one cover, new developments from different institutions and scientists. The scientific success stories cover science and technology innovations as applied to solving some of the chronic developmental and societal challenges that Africa has to face across the fields of health, the environment, and energy sustainability.

The book has four sections and eleven articles in all. The first section deals with issues relating to health. The article by **Ameenah Gurib-Fakim (Mauritius)** shows medicinal plants providing solutions for certain chronic diseases. It advocates the formulation and implementation of biodiversity policies and laws that translate ancestral traditions into modern businesses that will make the continent healthier and keep it prosperous. The contribution from **Philippe Rasoanaivo, David Ramanitrahambola, and Suzanne Ratsimamanga (Madagascar)** outlines research in Madagascar on natural drug discovery and botanical formulation, and presents an inventory of the country's published and unpublished ethnomedical data. The article by **Charles Wambebe, Hadiza Khamofu, Joseph Okogun, Nathan Nasipuri, Karynius Gamaniel, and the late Rev. P. O. Ogunyale (Nigeria)** describes the discovery of an African herbal medicine, Niprisan, which is at an advanced trial stage and, if successful, will save the lives of many people suffering from deadly sickle-cell anaemia on the continent. The article by **Dan K. Monyeki and H. C. G. Kemper (South Africa)** investigates the development of under-nutrition in rural children in Ellisras, South Africa, from infancy to adolescence over an eight-year period. It emphasizes the introduction of community-based programmes to modify behaviour, thereby preventing the development of malnutrition factors

associated with morbidity and mortality. The article by **Jane M. Olwoch (South Africa)** discusses the effects of climate change on the distribution of ticks and tick-borne diseases in sub-Saharan Africa, as well as the effects on the social, cultural, and economic fabric.

The second section has two articles. The first, by **Kassim S. Mwitondi (UK)**, reviews successful information and communication technology (ICT) applications in Africa, and analyzes and identifies key challenges to be overcome for the future. The second article, by **Aderemi Kuku (USA)**, outlines the linkage between the mathematical sciences and socio-economic development, and highlights the importance of mathematics in science education and research.

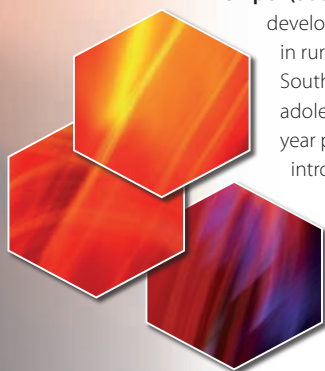
The third section contains three articles on issues related to the environment. The article by **Romeela Mohee, Ackmez Mudhoo, Geeta Unmar, Vijayalaxmi Jumnoodoo, and Nafiisa Sobratee (Mauritius)** focuses on composting organic waste to assess the degradation of plastic bags and to study the mechanistic pathways of pesticide decomposition in a composting environment. The article by **Bhanooduth Lalljee and Sunita Facknath (Mauritius)** discusses the vulnerability of small island states to the effects of globalization and investigates the main measures (including policies) taken by the Government of Mauritius to face the challenges. **Chris J. C. Reason (South Africa)** argues for the application of regional ocean models to simulate circulation and tide, marine ecosystems, sediment transport, and biogeochemistry along African coastal waters, as well as other features related to regional climate and marine biodiversity.

The final section deals with renewable energy. The contribution by **Francis P. Gudyanga, Clement S. Shonhiwa, and Zivai Chiguvare (Zimbabwe)** deals with the production of bio-diesel from non-edible *Jatropha* seeds and describes the economic importance of this type of energy to the rural community.

This collection of articles reveals science, technology, and innovation as a critical engine for accelerated socio-economic development in Africa. It shows the private sector to be an important player in education, research, development, and the commercialization of Africa's natural products such as traditional medicine and indigenous knowledge. It is planned that further volumes of science, technology, and innovation success stories from Africa will be published every two years by the ICSU Regional Office for Africa.

Pretoria, October 2008

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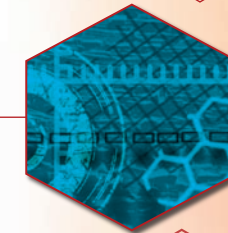


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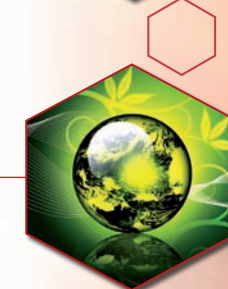
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- **The role of *Jatropha* in biodiesel production and sustainable development in Africa**
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The ICSU Regional Office for Africa

Founded in 1931, the International Council for Science (ICSU) is a non-governmental organization with a global membership of national scientific bodies (114 members, representing 134 countries) and international scientific unions (29 members). Its long-term strategic vision is for a world where science is used for the benefit of all, excellence in science is valued, and scientific knowledge is linked effectively to decision-making.

The ICSU Regional Office for Africa (ICSU ROA), with its Secretariat in Pretoria, South Africa, was inaugurated on 1 September 2005. It endeavours to ensure that scientists from Africa are fully involved in the international research programmes of the ICSU family and its partners. This Regional Office also promotes and facilitates the utilization of science, technology, and innovation for accelerated economic growth and poverty reduction on the continent.

It has prepared and published four science plans for the socio-economic development of sub-Saharan Africa: *Sustainable Energy; Health and Human Well-being; Natural and Human-induced Hazards and Disasters; and Global Environmental Change (including Climate Change and Adaptation)*. The projects developed from these science plans are being implemented by African scientists, engineers, technologists, and policy-makers, in collaboration with their partners in other parts of the world, and details may be found on the Regional Office's website (<http://www.icsu-africa.org/>).

The contents of this book, *Science, Technology, and Innovation for Socio-economic Development: Success Stories from Africa*, are in line with the objectives of the four science plans mentioned above, as well as part of the long-term ICSU strategic vision. It is envisaged that ICSU ROA will continue producing such publications as part of its mandate to promote science education and research in Africa.

The book and its authors

Science, Technology, and Innovation for Socio-economic Development: Success Stories from Africa is written for scientists, engineers, technologists, educators, and policy- and decision-makers engaged in socio-economic development programmes and initiatives in Africa. It is also relevant and useful to private-sector individuals and organizations who have an interest in developing and commercializing the continent's natural resources.

The authors of the articles contained in this volume are practising scientists, engineers, and technologists with years of research experience in their scientific fields. This book was prepared to supplement the scientific documents for the 29th ICSU General Assembly held in Mozambique in October 2008. It is in press and will be available in early 2009.

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Science, Technology, and Innovation for Socio-economic Development **SUCCESS STORIES FROM AFRICA**

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