

Review

Industrial biotechnology for developing countries: The case for genetically modified biofuels in Kenya

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Attempts to diversify the energy portfolios of developed countries with green technologies have brought competition between food and fuel for crop production resources to the forefront of public policy debates. Biofuel policies in the European Union (EU) and the United States (US) mandate the long-term use of renewable energy in transportation, independent of production capacity and technical feasibility. Both the US and EU policies explicitly allow for biofuel imports and, hence, have the potential to provide developing countries with export opportunities. For example, the EU is seen as a market that could be supplied with biofuels produced in Kenya. As a result, contentious land acquisitions have been made in Kenya to make way for sugar cane and *Jatropha* cultivation for biofuel production. One potential means of improving the efficiency of Kenya's agricultural sector is the application of transgenic technologies. The objective of this article is to assess whether a biofuel industry could be developed in Kenya, based on the use of genetically modified (GM) feedstocks to supply the EU demand for biofuel. This article concludes that GM agriculture will improve the economic returns for those Kenyan farmers willing to engage in the production of GM biofuel crops.

Key words: Barriers to trade, energy policy, genetically modified (GM) crops, international trade, land-use policy.

INTRODUCTION

Interest in producing biofuels has risen significantly in recent years in response to increased instability in international oil supplies, the environmental degradation associated with greenhouse gas (GHG) emissions and government policies which support the development of energy alternatives to fossil fuels. The desire to find alternative sources of energy, particularly for transportation purposes, has resulted in large scale government investments in, and support for, the biofuel industry. The United States (US), the European Union (EU) and a number of other countries, including developing countries, have encouraged the development of renewable energy in an attempt to enhance energy security and to mitigate the ne-

gative effects arising from GHG emissions (Viju and Kerr, 2013). The EU and US policies mandate significant domestic use of biofuels, in spite of capacity constraints in the EU and technical limitations in the US.

These industry support measures, which artificially boosts demand for biofuels, create potential beneficial opportunities for developing countries endowed with large amounts of land suitable for growing biomass. The potential for genetically modified (GM) crops to support biofuel production in developing countries exists as observed, for example, in Brazil and Argentina. However, diversifying the energy mix with biofuel production may result in a loss of natural capital, (defined as the stock of natural resources, environmental and ecosystem resources used as inputs in the production of goods and services in addition to being enjoyed for its own sake) (Olewiler, 2004) including biodiversity. The EU's Renewable Energy Directive (RED) (2009) imposes regulatory constraints on

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Small High Technology Firms In Developing Countries The Case Of Biotechnology

Robert R. Redfield



Small High Technology Firms In Developing Countries The Case Of Biotechnology:

Small High Technology Firms in Developing Countries Regina Galhardi,1994 The objective of this research is to examine the institutional development of biotechnology in Brazil and in particular the role played by small firms in fostering biotechnology in the health and agriculture sectors and their relationship with both universities and large firms Pref

Small High Technology Firms in Developing Countries Regina Maria de Almeida Arao Galhardi,1991 *The International Politics of Biotechnology* Alan M. Russell,John Vogler,2000 There are three sections The first considers the nature of the science itself the normative questions raised and the significance of gender responses Following these broad issues the second section addresses biotechnology in relation to international political economy trade and the environment highlighting the politics of food and patents The final section tackles the question of biological knowledge applied to weapons and the global responses

Comparing High Technology Firms in Developed and Developing Countries: Cluster Growth Initiatives Bas, Tomas Gabriel,2012-05-31 Clusters are geographic concentrations of interconnected companies specialized suppliers service providers and associated institutions in a particular field that are present in a nation or region The development and upgrading of clusters is an important agenda for governments companies and other institutions Cluster growth initiatives are an important new direction in economic policy building on earlier efforts in macroeconomic stabilization privatization market opening and cost reduction related to doing business Comparing High Technology Firms in Developed and Developing Countries Cluster Growth Initiatives is the leading source of information for readers interested in this field of study as it promotes scientific discussion on policies and practice of cluster growth as well as covers the emerging research topics which are going to define the future of the management of technology Furthermore this book demonstrates the effectiveness and efficiency of technology policy based on observations of differential growth rate of high technology firms in clusters and explores the factors that explain superior performance of high technology firms to contribute the improvement of technology policy in both developed and developing countries

High Technology, Productivity and Networks Patrizio Bianchi,Roger Sugden,2008-04-30 Progress in telecommunications and infrastructure coupled with liberalization in international organizations has introduced a number of new competitors to existing SMEs This book analyzes strategic aspects of SME development that may help to promote growth high tech development productivity increase and strengthening of linkages

The Economics of Intellectual Property. Suggestions for Further Research in Developing Countries and Countries with Economies in Transition World Intellectual Property Organization,2009-01-01 The series of papers in this publication were commissioned from renowned international economists from all regions They review the existing empirical literature on six selected themes relating to the economics of intellectual property identify the key

research questions point out research gaps and explore possible avenues for future research **Biotechnology: Concepts, Methodologies, Tools, and Applications** Management Association, Information Resources,2019-06-07 Biotechnology can

be defined as the manipulation of biological process systems and organisms in the production of various products With applications in a number of fields such as biomedical chemical mechanical and civil engineering research on the development of biologically inspired materials is essential to further advancement Biotechnology Concepts Methodologies Tools and Applications is a vital reference source for the latest research findings on the application of biotechnology in medicine engineering agriculture food production and other areas It also examines the economic impacts of biotechnology use Highlighting a range of topics such as pharmacogenomics biomedical engineering and bioinformatics this multi volume book is ideally designed for engineers pharmacists medical professionals practitioners academicians and researchers interested in the applications of biotechnology

Interpreting East Asian Growth and Innovation H. Khan, 2004-02-09 Haider A Khan goes beyond the study of catch up technology and raises the question of innovation processes that are the key to the future growth and prosperity of the East Asian economies This is particularly important in the aftermath of the Asian financial crises that have cost these economies much How can newly industrialized economies achieve cohesive systems of innovation for sustainable growth The author offers a novel theory of innovation systems with concrete case studies to illustrate its usefulness

Globalization of Technology Prasada Reddy, 2009-08-25 Globalization of Technology is a component of Encyclopedia of Technology Information and Systems Management Resources in the global Encyclopedia of Life Support Systems EOLSS which is an integrated compendium of twenty one Encyclopedias This book on Globalization of Technology provides the essential aspects and fundamentals of Issues in Technology Transfer and Technological Capability Building such as Techno Economic Paradigms and Latecomer Industrialization Knowledge Networks and the Internet Technology Transfer Vehicles Conditions Spillovers and Policy Challenges The Social Implications of Technological Development Industrialization and Innovation as a Collective Process This volume is aimed at the following five major target audiences University and College students Educators Professional practitioners Research personnel and Policy analysts managers and decision makers and NGOs

Abstracts on Rural Development in the Tropics , 1994

Technological Systems in the Bio Industries B. Carlsson, 2012-12-06 Technological Systems in the Bio Industries An International Study represents a comprehensive interdisciplinary and systematic effort to understand the nature and role of technological change in a rapidly evolving arena of economic activity that can be loosely referred to as the bio industries These include biomedical industries that deliver goods and services used in health care including those based on genetic engineering as well as applications of biotechnology in other industries such as agriculture food production and the forest industries This volume is the third in a continuing series of studies on technological systems it seeks to identify and address new sets of conceptual and methodological issues in analyzing innovation systems particularly as regards the delimitation of relevant systems The book makes an in depth comparison of the biomedical clusters in Sweden and Ohio It also sheds light on the emergence of new science based technological systems

Current Research in Britain , 1992 **Comparative Approaches to Biotechnology**

Development and Use in Developed and Emerging Nations Bas, Tomas Gabriel,Zhao, Jingyuan,2016-10-19 The development of biotechnological innovations is quickly becoming a globalized phenomenon as emerging nations are making major strides to compete with more developed economies Though efforts to bridge the gap between emerging and developed nations have been successful there are still many barriers that need to be overcome Comparative Approaches to Biotechnology Development and Use in Developed and Emerging Nations evaluates the importance of manufacturing biotechnological products around the world Highlighting a comparative analysis of public policies technological policies innovations and marketing capabilities of developed and emerging nations this publication is a pivotal reference source for government officers policy makers academics and practitioners *Innovation, Path Dependency, and Policy* Jan Fagerberg,David Mowery,Bart Verspagen,2009-02-12 The concept of National Innovation Systems is well established in academic research and enthusiastically adopted by policymakers Yet there are relatively few in depth studies of individual national innovation systems This book provides just that a model for the application of the concept to an individual economy Leading scholars provide a detailed analysis of the particular circumstances of Norway a high income high productivity resource rich economy with relatively modest investment in R D and a remarkable track record of social equity The authors argue that investment in human capital may be more significant than any formula for R D investment The book includes contributions from historians economists and political scientists and offers an unparalleled account of the development of one of the world s most successful economies It will be essential reading fro academics and policymakers concerned with innovation and growth

Indian and Chinese Enterprises N S Siddharthan,K Narayanan,2020-11-29 This book compares India and China important players in industries like IT automobiles electronics bio technology and pharmaceuticals It discusses the globalisation of these enterprises focussing on e commerce equity and non equity alliances offshore investment etc

Made in Estonia Marek Tiits,2006

Managing Biotechnology Francoise Simon,Glen Giovannetti,2017-10-16 A comprehensive overview of the new business context for biopharma companies featuring numerous case studies and state of the art marketing models Biotechnology has developed into a key innovation driver especially in the field of human healthcare But as the biopharma industry continues to grow and expand its reach development costs are colliding with aging demographics and cost containment policies of private and public payers Concurrently the development and increased affordability of sophisticated digital technologies has fundamentally altered many industries including healthcare The arrival of new information technology infotech companies on the healthcare scene presents both opportunities and challenges for the biopharma business model To capitalize on new digital technologies from R D through commercialization requires industry leaders to adopt new business models develop new digital and data capabilities and partner with innovators and payers worldwide Written by two experts both of whom have had decades of experience in the field this book provides a comprehensive overview of the new business context and marketing models for biotech companies Informed by extensive

input by senior biotech executives and leading consultancies serving the industry it analyzes the strategies and key success factors for the financing development and commercialization of novel therapeutic products including strategies for engagement with patients physicians and healthcare payers Throughout case studies provide researchers corporate marketers senior managers consultants financial analysts and other professionals involved in the biotech sector with insights ideas and models JACQUALYN FOUSE PhD RETIRED PRESIDENT AND CHIEF OPERATING OFFICER CELGENE Biotech companies have long been innovators using the latest technologies to enable cutting edge science to help patients with serious diseases This book is essential to help biotech firms understand how they can and must apply the newest technologies including disruptive ones alongside science to innovate and bring new value to the healthcare system BRUCE DARROW MD PhD CHIEF MEDICAL INFORMATION OFFICER MOUNT SINAI HEALTH SYSTEM Simon and Giovannetti have written an essential user s manual explaining the complicated interplay of the patients who deserve cutting edge medical care the biotechnology companies big and small creating the breakthroughs and the healthcare organizations and clinicians who bridge those worlds EMMANUEL BLIN FORMER CHIEF STRATEGY OFFICER AND SENIOR VICE PRESIDENT BRISTOL MYERS SQUIBB If you want to know where biopharma is going read this book Our industry is facing unprecedented opportunities driven by major scientific breakthroughs while transforming itself to address accelerated landscape changes driven by digital revolutions and the emergence of value based healthcare worldwide In this ever changing context we all need to focus everything we do on the patients They are why we exist as an industry and this is ultimately what this insightful essay is really about JOHN MARAGANORE PRESIDENT AND CHIEF EXECUTIVE OFFICER ALNYLAM PHARMACEUTICALS Since the mapping of the human genome was completed nearly 15 years ago the biotechnology industry has led the rapid translation of raw science to today s innovative medicines However the work does not stop in the lab Delivering these novel medicines to patients is a complex and multifaceted process which is elegantly described in this new book *Science & Engineering Indicators* ,1987 *Third World Multinationals* F.

Beausang,2003-07-25 This book evaluates the contribution of third world multinational enterprises to the competitiveness of their home and host countries in the context of Brazilian and Chilean MNE s Third world MNE s can be important agents of growth a fact that until now has been largely ignored in the literature This book fills the gap in the literature by looking at third world MNE s ability to innovate and examining the potential for their innovations to be diffused to other home country firms and thereby improve their home country s competitiveness **Bibliography of Agriculture with Subject Index** ,1993-05

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