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**CALESTOUS JUMA**

**Curriculum Vitae**

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[Mailto:Calestous\\_Juma@Harvard.Edu](mailto:Calestous_Juma@Harvard.Edu)  
<http://www.cid.harvard.edu/cidtech/>

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## CONTENTS

<b>1. Education</b> .....	1
<b>1. Education</b> .....	2
<b>2. Awards and Grants</b> .....	2
<b>3. Academic Guidance</b> .....	2
<b>4. Employment</b> .....	2
<b>5. Consultancy</b> .....	5
<b>6. Special Assignments</b> .....	5
<b>7. Other Professional Activities</b> .....	6
<b>8. Professional Membership</b> .....	8
<b>9. Research Interests</b> .....	8
<b>10. Selected Publications</b> .....	8
<i>Books and booklets</i> .....	8
<i>Contributions to volumes</i> .....	9
<i>Articles</i> .....	11
<i>Conference papers</i> .....	12
<i>Consultancy reports</i> .....	15
<i>Monographs</i> .....	17
<i>Newspaper articles</i> .....	18

## 1. Biographical summary

**CALESTOUS JUMA** is Director of the Science, Technology and Innovation Program at Center for International Development at Harvard University and a Senior Research Associate at the Belfer Center for Science and International Affairs at Harvard University. He is former Executive Secretary of the United Nations Convention on Biological Diversity and founding Executive Director of the African Centre for Technology Studies in Nairobi (Kenya), an independent public policy research institution. He has won several international awards, including the 1991 Pew Scholars Award in Conservation and the Environment and the 1993 United Nations Global 500 Award. He holds a PhD in Science and Technology Policy Studies from the Science Policy Research Unit at the University of Sussex (UK) and has worked as a teacher, science writer, chief executive officer and advisor.

He is Visiting Professor at the University of Strathclyde (UK), Member of the Kenya National Academy of Sciences, Fellow of the New York Academy of Sciences, Member of the United States National Research Council's Board on Agriculture and Natural Resources and Associate Editor of the *International Journal of Biotechnology*. He directed the International Diffusion of Biotechnology Programme of the International Federation of Institutes of Advanced Study and was senior special fellow of the United Nations Institute for Training and Research.

He was a member of the Gulbenkian Commission on the Restructuring of the Social Sciences and several other international initiatives. He serves or has served on the governing and advisory bodies of several international organizations including World Resources Institute, United Nations University's Institute for New Technologies, Center for International Environmental Law and Earthwatch Institute. He has consulted for, among others, the World Bank, United Nations Development Programme, United Nations Environment Programme, World Intellectual Property Organization, Food and Agriculture Organisation, United Nations Educational, Scientific and Cultural Organisation, United Nations Industrial Development Organisation, United Nations Conference on Trade and Development and International Development Research Centre.

His research interests include: evolutionary and systems theory; science and technology policy studies; institutional change; biotechnology, biological diversity; international trade and international environmental policy. He is currently working on a book on biotechnology and comparative public policy. He has written widely on issues of science, technology and environment. His works include *Long-Run Economics: An Evolutionary Approach to Economic Growth* (Pinter, 1987); *The Gene Hunters: Biotechnology and the Scramble for Seeds* (Princeton University Press and Zed Books, 1989); *Innovation and Sovereignty: The Patent Debate in African Development* (African Centre for Technology Studies, 1989); *Coming to Life: Biotechnology and African Economic Recovery* (Acts Press and Zed Books, London, 1994) and *Economic Policy Reforms and the Environment: Africa Experiences* (UNEP, 1995 and *In Land We Trust: Private Property, Environment and Constitutional Change* (Initiatives Publishers and Zed Books, London, 1996).

## **2. Education**

- 1972–74: Egoji Teachers' College; Teachers' Certificate.  
1982–83: Science Policy Research Unit, University of Sussex; MSc. (Science, Technology and Industrialization).  
1983–86: Science Policy Research Unit, University of Sussex; DPhil. (Science and Technology Policy Studies).

## **3. Awards and grants**

- 1967: School Award for Highest CPE Grades.  
1971: School Award for Highest EACE Grades.  
1974: College Awards for Outstanding Academic and Sports Performance.  
1982: International Development Research Centre's Programme-Related Award for Energy Training.  
1983: International Development Research Centre's Energy Training Award.  
1986: Mennonite Central Committee and Lutheran World Relief Research Grant on the Legal Aspects of the Grassroots Conservation of Biological Diversity.  
1987: Ford Foundation Research Grant on the Conservation of Biological Diversity.  
1989: Ford Foundation Research Grant on Property Rights and Natural Resource Management.  
1990: International Development Research Centre Research Grant on Economic Reforms and Environmental Conservation.  
1991: Pew Scholars Award in Conservation and the Environment.  
1992: Justinian Rweyemamu Prize (on behalf of the African Centre for Technology Studies).  
1993: United Nations Environment Programme's Global 500 Award.

## **4. Academic guidance**

Provided academic guidance to post-graduate students at various universities in fields of science policy, energy development and diplomacy. Trained policy makers from various African countries (including Kenya, Uganda, Tanzania, Ethiopia, Malawi, Ghana and Zambia) in policy analysis techniques. The course focuses on the application of science and technology to sustainable development. Guided and supervised over 50 undergraduate and post-graduate interns from local and overseas universities.

## **5. Employment**

### ***Program Director, Center for International Development at Harvard University (1999-Present)***

Directs the Science, Technology and Development Program at CID. The aim of the program is to integrate science and technology considerations into development studies through research, training and outreach activities. Promotes inter-faculty consultations on science, technology and development. The program is a joint effort of CID and the Belfer Center for Science and International Affairs at Harvard University and is undertaken in cooperation with the Program in Science, Technology and Society at the Massachusetts Institute for Technology.

***Special Advisor, Center for International Development at Harvard University (1998-1999)***

Served as Special Advisor to the Director of CID (Professor Jeffrey Sachs) on the integration of science and technology issues into international development studies and assisted in the development of a program on the same subject.

Established the Permanent Secretariat of the Convention on Biological Diversity in Montreal, Canada and provided its executive direction, management and intellectual leadership for the Permanent Secretariat of the 174-member United Nations Convention on Biological Diversity. Directed the implementation of the programmes of the Secretariat on behalf of the Conference of the Parties (COP) and mobilized voluntary contributions for the work of the Secretariat. Managed the activities of the subsidiary organs of the COP that include the Subsidiary Body for Scientific, Technical and Technological Advice (SBSTTA) and the Open-ended Ad Hoc Working Group on Biosafety. Served as the representative of the Conference of the Parties at the international level and negotiated collaborative agreements between the Convention and other international institutions including the Food and Agriculture Organization (FAO), the United Nations Scientific, Educational and Scientific Organization (UNESCO), the World Intellectual Property Organization (WIPO) and the World Bank. Facilitated coordination between the Convention and other biodiversity-related treaties and institutions and oversaw the preparation of the first set of national reports on the implementation of the Convention. Serviced three meetings of the Conference of the Parties, three meetings of SBSTTA, five meetings of the Ad Hoc Working Group on Biosafety, 12 regional preparatory meetings for COP and several expert meetings on technical and regional cooperation. Guided the establishment of the Clearing-house Mechanism for scientific and technical cooperation under the Convention. Maintained an international network of scholars, diplomats and researchers on issues related to the conservation and sustainable use of biological diversity.

***Executive Director, African Centre for Technology Studies (1988–1995)***

Founder and director of ACTS, the first African non-profit organization established to promote policy research, undertake training and disseminate information on the application of science and technology to sustainable development. ACTS is a non-partisan, not-for-profit institution established to conduct policy research in technological innovation and environmental management. In 1992, the Centre was awarded the international Justinian Rweyemamu Prize for “expanding the knowledge base for Africa’s development.” Responsibilities include policy research, programme conceptualization and development, fund-raising, human resource mobilization, international relations and promotion of the Centre’s activities, programme management, quality control, training of researchers, overall administration of the Centre and representing the Centre in international forums.

***Course Director, Sustainable Development Policy Analysis, ACTS (1992–1995)***

Formulated and directed a course for African policy makers in technology and sustainable development. The course was designed to train African policy makers in methods of policy analysis needed to integrated sustainable development into decision-making.

***Director, Biopolicy Institute of ACTS, The Netherlands (1991–1992)***

Directed the Biopolicy Institute of the ACTS located at Maastricht in the Netherlands. The Institute conducted research, training and information dissemination on issues related to biotechnology and genetic resources.

***Project Leader, Economic Reform and Environment in Africa (1990–1994)***

Directed the regional Economic Reform and Environment in Africa project funded by the International Development Research Centre (IDRC) through ACTS. The main aim of the project was to examine the links between economic policies and environmental conservation efforts in Africa and identify policy options that would ensure that economic adjustment does not undermine the integrity of the environment.

***Programme Director, International Federation of Institutes for Advanced Study (IFIAS) (1989–1991)***

Directed the International Diffusion of Biotechnology Programme of the International Federation of Institutes for Advanced Study (IFIAS). The programme was executed by ACTS and involved research teams from Chile, Brazil, Mexico, USA, UK, Denmark, Sweden, Netherlands, India, China, Thailand, Kenya, Nigeria and Zimbabwe. The aim of the programme was to understand the diffusion of biotechnology and help the developing countries formulate policies which can enable them to apply biotechnology to sustainable development. Founded *Biopolicy International*, a series devoted to policy issues on biotechnology and the conservation of biological diversity.

***Project Director, Genetic Resources and Biotechnology (1986–1989)***

Initiated a project, with the financial support of various local and international organizations, to examine the potential positive and negative impacts of biotechnology on African economies. The project provided alternative policy options for Africa given the current ecological and economic crises. The study involved monitoring global trends in biotechnology, examining policy responses and initiative activities that could lead to new directions in agricultural development.

***Research Associate and Project Leader, Public Law Institute, Nairobi (1984–1986)***

This position involved formal and informal consultation and support for the project design and development activities of the institute, especially on policy and legal issues related to environment and the application of science and technology to development. Conducted a study on technology policy issues related to the production and use of fuel alcohol in Kenya, Zimbabwe, Malawi and Brazil. Its empirical aspects dealt with the transfer of energy technology to African countries and led to the formulation of an alternative approach to the analysis of social transition based on systems and evolutionary concepts.

***Visiting Lecturer, Swiss Federal Technical Institute (ETH), Zurich (1984)***

Gave a series of lectures on the role of energy in social change. The lectures were based on comparative research conducted in Kenya, Zimbabwe and Switzerland and aimed at bringing grassroots activities to bear on academic work.

***Editor and Researcher, Environment Liaison Centre, Nairobi (1979–1982)***

Conducted research on the linkages between environment and development especially in developing countries with specific emphasis on the role of non-governmental organizations (NGOs). The aim of the research was to identify emerging issues and alert the NGO community through ELC's trilingual journal, *Ecoforum*. The issues covered included food production, energy utilization and genetic resource management. The functions also involved editing *Ecoforum*. The journal was distributed globally to over 7,000 organizations and became a major vehicle for raising awareness on environmental issues.

***Science and Environment Writer, Nation Newspaper, Nairobi (1978–1979)***

Researching and writing articles and editorials on science and technology issues, with emphasis on the interactions between technology, environment and population. The central objective was to present technical issues in a language that could be understood by the general public, especially practitioners and activists at the grassroots. It also entailed making some of the global concerns more relevant to Kenyan local conditions. This was the first time that environmental issues were regularly covered in the local media.

***Science Teacher, Mombasa, Kenya (1974–1978)***

**6. Consultancy**

Consulted for various UN and other agencies (such as UN Environment Programme, Nairobi; UN Conference on Trade and Development, Geneva; UN Educational Scientific and Cultural Organization; UN Industrial Development Organization; UN Development Programme; the World Intellectual Property Organization; the Food and Agriculture Organisation of the UN, Rome; and the World Bank) on science and technology policy, technology transfer, environment, population migration, energy development, and food production. Consulted for governments and international non-governmental organizations.

**7. Special assignments**

*1. Government of Finland (1999)*

Chaired an International Mid-Term Review Panel for the Finnish Biodiversity Research Programme (FIBRE) under the auspices of the Academy of Finland.

*2. United States Agency for International Development (1995)*

Assisted the United States Agency for International Development (USAID) in determining options for supporting natural resource management activities in Kenya.

*3. United Nations Environment Programme (1994)*

Served as a member of the Global Environment Facility (GEF) Transition Planning Team for UNEP. The task involved working with senior professionals in developing an implementation strategy and work programme for realizing UNEP's mandate in the Facility.

*4. Centre for Our Common Future (1991–92)*

Prepared background documents used for reconvening the World Commission on Environment and Development (WCED) chaired by Gro Harlem Brundtland.

*5. Government of Kenya (1991)*

Assisted the Government of Kenya in preparing draft revisions of the Non-Governmental Organisations Coordination Act as well as draft regulations for the implementation of the Act.

*6. Government of Kenya (1989)*

Prepared policy papers and drafted the Industrial Property Bill for the Kenya Government. The Bill was adopted by the Parliament of Kenya in 1989 and the Kenya Industrial Property Office (KIPO) was established in early 1990.

*7. The Economic Intelligence Unit, London (1986)*

Preparation of the quarterly reports of the EIU on Kenya. The aim of the reports was to bring together up-to-date information on economic developments in Kenya for use by investors, scholars and other professionals.

**8. Other professional activities**

*Membership*

Committee on Agricultural Biotechnology, Health and the Environment, United States National Research Council (2000-Present)

Board on Agriculture and Natural Resources, United States National Research Council (2000-Present)

Working Group on Biotechnology, Advisory Committee on International Economic Policy, Department of State (2000-Present)

Advisory Board, International Biodiversity Observation Year, (2001-2002)

Advisory Board, Center for Health and the Environment, Harvard Medical School (2000-Present)

Steering Committee, Millennium Ecosystems Assessment (1998-Present)

High-Level Advisory Panel on Biodiversity to the Executive Director of UNEP (1994–1995).

Board of Trustees of the Manor House Agricultural Centre, Kitale, Kenya (1994–1995).

Commission on Environmental Law (1994-Present).

Gulbenkian Commission on the Restructuring of the Social Sciences (1994–1995).

## CALESTOUS JUMA

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Advisory Panel for Green Globe Yearbook, Fridtjof Nansen Institute, Norway (1994-Present).  
Board of Directors of the World Resources Institute, Washington, DC (1993-Present).  
Board of Directors of the Center for International Environmental Law, Washington, DC (1994-Present).  
International Consultative Group on Sustainable Development for the International Development Research Centre (IDRC) and the Swedish Agency for Research Cooperation with Developing Countries (SAREC) (1993-1995).  
Roster of Experts on Biodiversity of the Global Environment Facility's Scientific and Technical Panel (STAP) (1993-1995).  
Humanities and Social Sciences Committee of the Kenya National Academy of Sciences (1994-Present).  
Specialist Committee on Industrial Sciences, Kenya National Council for Science and Technology (NCST) (1994-1995).  
Council of the World Resources Institute, Washington, DC (1992-1994).  
Steering Group of the Technical Assistance Project on the International Trade Programmes (ITO), of the United Nations Conference on Trade and Development (UNCTAD), Geneva (1992-1994).  
Working Party on Biological Diversity, Secretariat of the United Nations Conference on Environment and Development, Geneva (1990-1992).  
Board of Directors of the United Nations University's Institute for New Technologies, Maastricht, The Netherlands (1991-1992).  
International Coordinating Group, Biodiversity Conservation Strategy Programme, Washington, DC (1991-1993).  
Board of Directors the Biofuture Foundation, Stockholm, Sweden (1990-1992).  
Board of Directors of Initiatives Limited, Kenya (1988-Present).  
International Steering Committee on the International Dialogue Series on Biological Diversity and Genetic Resources (Keystone Centre, Colorado, USA) (1987-1989).  
International Committee on Rethinking International Governance (The Hubert H. Humphrey Institute of Public Affairs, University of Minnesota, USA) (1987-1992).

### *Secretary*

International Conferences on Biotechnology in the Global Economy, Harvard University, 1999, 2000.  
Conferences of the Parties to the Convention on Biological Diversity, 1995-1998.  
International Conference on the Convention on Biological Diversity: National Interests and Global Imperatives, Nairobi, January 26-29, 1993.  
International Symposium on Biotechnology and International Trade: 1992 and Beyond, Maastricht, The Netherlands, June 22-24, 1990.  
International Workshop on Technological Information and Environmental Issues for Small Industrial Enterprises, Nairobi, May 14-16, 1990.  
International Conference on Global Warming and Climatic Change, United Nations Environment Programme, Nairobi, May 2-4, 1990.  
International Symposium on Biotechnology for Sustainable Development, United Nations Environment Programme, Nairobi, February 27-March 3, 1989.

*Editorial functions*

Associate Editor, *International Journal of Biotechnology* (1999-Present)

Founding Technical Editor of *Resources*, a journal of the Kenya Energy and Environment Organisations (KENGO) (1988–1989).

Editorial Advisory Board Member, *Science and Public Policy* journal (1989–Present).

Editorial Advisory Board Member, The Living Economy Network, UK (1989–1995).

Editorial Advisor, *Africa* journal, published at the University College, London (1987–Present).

Editorial Board of *Renews*, official journal of the United Nations Conference on New and Renewable Sources of Energy (Nairobi) (1981).

**9. Professional membership**

1. Royal Society of Arts, UK
2. New York Academy of Sciences
3. Kenya National Academy of Sciences, Kenya.
4. International Society for the Study of Time, USA.
5. European Association for Evolutionary Political economy, UK.

**10. Research interests**

His research interests include: evolutionary and systems theory; science and technology policy studies; institutional change; biotechnology, biological diversity; international trade and international environmental policy.

**11. Selected publications**

***Books, volumes and booklets***

2000. Biotechnology in the Global Economy. Guest Editor, *International Journal of Biotechnology*, vol. 1/2/3, pp. 1-273.

2000. *Science, Technology and Economic Growth: Africa's Biopolicy Agenda for the 21st Century*. United Nations University, Tokyo.

1996. *In Land We Trust: Environment, Private Property and Constitutional Change*. Zed Books, London and Initiatives Publishers, Nairobi (co-edited with J.B. Ojwang).

1995. *Economic Policy Reforms and the Environment: African Experiences*. Geneva: United Nations Environment Programme (co-written with Hugh Monteith, Hartmut Krugmann, Tobias Angura, Herbert Acquay, Akino Anthony E., Philip Wandera and John Mugabe).

1994. *Sustainable Human Development: From Concept to Operation: A Guide for the Practitioners*. New York: United Nations Development Programme, April (with Tariq Banuri, Goran Hyden and Marcia Rivera).

## CALESTOUS JUMA

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1994. *Coming to Life: Biotechnology in African Economic Recovery*. Nairobi: Acts Press and Zed Books, London (co-edited with John Mugabe and Patricia Kameri-Mbote).
1994. *Biodyplomacy: Genetic Resources and International Relations*. Nairobi: Acts Press (co-edited with Vicente Sánchez).
1993. *The Adaptive Economy: Economic Crisis and Technological Change*, Nairobi: Acts Press (with C. Torori and C.C.M. Kirima).
1993. *Technology Transfer and Sustainable Development*, Acts Press, Nairobi (with J.B. Ojwang).
1992. *Property Rights, Biotechnology and Genetic Resources*, Acts Press, Nairobi (with Mohamed Khalil and Walter Reid).
1992. *Biosafety: The Safe Application of Biotechnology in Agriculture and the Environment*, International Service for National Agricultural Research, The Hague (with G.J. Persley and L.V. Giddings).
1991. *Biotechnology and Sustainable Development: Policy Options for Developing Countries*, Acts Press, Nairobi (with Norman Clark).
1991. *A Change in the Weather: African Perspectives on Climatic Change*, Acts Press, Nairobi (co-edited with S.H. Ominde).
1989. *The Gene Hunters: Biotechnology and the Scramble for Seeds*, Zed Press, London and Princeton University Press.
1989. *Innovation and Sovereignty: The Patent Debate in African Development*, African Centre for Technology Studies, Nairobi (co-edited with J.B. Ojwang).
1989. *Gaining Ground: Institutional Innovations in Land-use Management in Kenya*, Acts Press, Nairobi (co-edited with Amos Kiriho).
1989. *Country Strategy for Strengthening Environmental Considerations in Danish Development Assistance to Kenya*, DANIDA, Ministry of Foreign Affairs, Copenhagen, Denmark (with Robert Munro).
1989. *Biotechnological Diversity and Innovation: Conserving and Utilizing Genetic Resources in Kenya*, Acts Press, Nairobi.
1987. *Long-Run Economics: An Evolutionary Approach to Economic Growth*, Pinter Publishers, London (with Norman Clark).
1980. *The Quest for Harmony: Perspectives on the New International Development Strategy*, Environment Liaison Centre, Nairobi.

### **Contributions to volumes**

2000. "Science and Technology in the Convention on Biological Diversity," In Raven, P. ed. *Nature and Human Society: The Quest for a Sustainable World*. Washington, DC: National Academy Press.
1998. "Sustainable Development and Institutional Change: Challenges and Options for Improving International Environmental Governance," In Softin, G.B., et al., *The Brundtland Commission's Report: 10 Years*. Oslo: Scandinavian University Press.
1997. "Public Policy and Generic Technologies: The Case of Biotechnology in Sub-Saharan Africa," In Bhagavan, M.R. ed. *New Generic Technologies in Developing Countries*. London: Macmillan Press (co-written with John Mugabe).

1996. "Private Property, Environment and Constitutional Change," In Juma, C. and J.B. Ojwang, eds. *In Land We Trust: Environment, Private Property and Constitutional Change*. London: Zed Books and Nairobi: Initiatives Publishers.
1996. "Towards Ecological Jurisprudence," In Juma, C. and J.B. Ojwang, eds. *In Land We Trust: Environment, Private Property and Constitutional Change*. London: Zed Books and Nairobi: Initiatives Publishers (co-written with J.B. Ojwang).
1996. "Property Rights, Medicinal Plants and Indigenous Knowledge," In Juma, C. and J.B. Ojwang, eds. *In Land We Trust: Environment, Private Property and Constitutional Change*. London: Zed Books and Nairobi: Initiatives Publishers (co-written with Arthur Okoth-Owiro).
1995. "Economic Policy Reforms and Sustainable Development." In Juma, C. *et al.*, *Economic Policy Reforms and the Environment: African Perspectives*. Geneva: United Nations Environment Programme.
1994. "Ecophilosophy and Parental Earth Ethics: On the Complex Web of Being," In Oruka, H.O., ed. *Philosophy, Humanity and Ecology: Philosophy of Nature and Environmental Ethics*. Nairobi: ACTS Press and the African Academy of Sciences.
1994. "Environmentally Sound Technology Transfer and Capacity Building in Africa: Strengthening Incentive Systems," in Hanisch, T. ed. *Climate Change and the Agenda for Research*. Boulder, Colorado: Westview Press.
1993. "Challenges and Opportunities for South-South Co-operation in Implementing the Convention on Biological Diversity," in Krattiger, A.F. *et al.* *Widening Perspectives on Biodiversity*. Geneva: International Academy of the Environment and World Conservation Union.
1993. "Promoting International Transfer of Environmentally Sound Technologies: The Case of National Incentive Schemes," in *Green Globe Yearbook 1994*, Oxford University Press.
1992. "Facing Africa's Ecological Crisis," in Seidman, a. and Anang, F. eds. *21st Century Africa: Towards a New Vision of Self-Sustainable Development*, African Studies Association Press and Africa World Press, Inc., New Jersey, USA (with Richard Ford in Association with Wanjiku Mwagiru).
1991. "Investment Strategy and Technology: Empirical Lessons from Power Alcohol Development" in Coughlin P. and Ikiara G.K., eds. *Kenya's Industrialization Dilemma*. Heinemann Kenya Limited, Nairobi.
1990. "Non-Equilibrium Economics: Alternative Paradigms and Technology Policy," in *New Paradigms—The World 300 Years After Newton*, World Academy of Art and Science, Stockholm.
1989. "Environment and Economic Policy in Kenya," in Kiriro, A. and Juma, C., eds. *Gaining Ground: Institutional Innovations in land-use Management in Kenya*, Acts press, African Centre for Technology Studies, Nairobi.
1989. "In Search of a New Regime for Protecting Innovations," in Juma, C. and Ojwang, J.B., eds. *Innovation and Sovereignty: The Patent Debate in African Development*, African Centre for Technology Studies, Nairobi (with Silas Ita).
1989. "Intellectual Property Rights for Biological Innovations," in Juma, C. and Ojwang, J.B., eds., *Innovation and Sovereignty: The Patent Debate in African Development*, African Centre for Technology Studies, Nairobi.

1989. "Intellectual Property Rights for the Jua Kali Sector," in Juma, C. and Ojwang, J.B., eds., *Innovation and Sovereignty: The Patent Debate in African Development*, African Centre for Technology Studies, Nairobi.
1989. "Technological Change and National Sovereignty," in Juma, C. and Ojwang, J.B., eds, *Innovation and Sovereignty: The Patent Debate in African Development*, African Centre for Technology Studies, Nairobi (with J.B. Ojwang).
1988. "Evolutionary Theories in Economic Thought," in Dosi, G. et al., eds., *Technical Change and Economic Theory*, Pinter Publishers, London (with Norman Clark).
1986. "Social Relations and Energy Technology Choice: The Case of Woodfuel and Power Alcohol in Kenya," in Stener, D. and Winsler, B. eds., *Human Ecology and Geography*, Lecture Series No. 28, Edigenossische Technische Hochschule (ETH), Zurich, Switzerland.
1986. "Alcohol From Sugarcane in Kenya and Zimbabwe: Project Implementation as Evolution," in *Energy for Development: What are the Solutions?*, International Solar Energy Society, London.
1985. "A Study of Ethanol Production in Kenya," in Egnues, H. et al., eds., *Bioenergy 84*, Vol. *Bioenergy in Developing Countries*, Elsevier Applied Science Publishers, London.

#### **Articles**

2000. "Biotechnology in the Global Economy," *International Journal of Biotechnology*, Vol. 2, no. 1/2/3, pp. 1-6.
1999. "International Ecosystem Assessment," *Science*, Vol. 286, 22 October, pp. 685-686.
1995. "'Get Up, Stand Up,' . . . Keep Up," *Ceres*, Vol. Vol. 27, No. 3, May, pp. 34-40 (with John Mugabe).
1995. "Policy Research in sub-Saharan Africa: An Exploration." *Public Administration and Development*, Vol. 15, pp. 121-137.
1994. "Tissue Culture for Coffee: The Case of Uganda," *Monitor* No. 20, pp. 19-20 (with J.M. Magambo and Hugh Monteith).
1992. "Notes on Technology," special supplement: Reviews of Agenda 21, *Network '92*, Number VII, Issue Number 15, March.
1991. "Africa Apart: Technology and Environment in the 1990s," *RSA Journal*, Vol. CXXIX, No. 5422, October, pp. 656-669.
1989. "The Last Harvest? Biotechnology and Third World Agriculture," *geneWatch*, Vol. 6, No. 2-3, pp. 1-3, 9-11.
1989. "Local Initiatives in Maintaining Biological Diversity," *ILEIA Newsletter*, Vol. 4, December, pp. 10-11.
1988. "Technology and Regional Collaboration: Policy Dimensions," *Southern African Political and Economic Monthly*, Vol. 1, No. 8 May, pp. 8-11.
1988. "Technology Policy and Economic Recovery: Africa's Weakest Link," *Southern African Political and Economic Monthly*, Vol. 1, No. 7, April, pp. 14-17.
1987. "Patents and Appropriate Technology: The Case for Utility Certificates," *Appropriate Technology*, Vol. 14, No. 3, December.
1985. "Market Restructuring and Technology Acquisition: Power Alcohol in Kenya and Zimbabwe," *Development and Change*, Vol. 16, No. 1, pp. 39-59.

1983. "New Energy in the Old Mould," *Futures*, Vol. 15, No. 5.
1983. "Renewable Sources of Energy and Environment," *Renewable Sources of Energy*, Vol. 1, No. 1.
1982. "Kenya: See How they Move," *Populi*, Vol. 9, No. 3.
1982. "Population and Patronage: An African Perspective," *Uniterra*, No. 1.
1981. "Kenya: Population and Resources," *Ambio*, Vol. 10. No. 4, Stockholm.
1980. "The State of World Food: Perspectives and Challenges," *World Environment Day Resource Pack*, Environment Liaison Centre, Nairobi.
1980. "Progress sans Pollution," *Development Forum*, Vol. 8, No. 9, Geneva.
1980. "Energy for Food," *Alam Sekita*, Malaysia, September.
1980. "World Conservation Strategy: Moulding a New Environmental Ethic," *Environment Awareness*, Vol. 2, No. 3, India.

**Conference papers**

1995. *Forging Ahead: Technology and Sustainable Development in Africa*. Regional Workshop on "Technology and Sustainable Development: Policy Options for Africa. Nairobi, March 29–30.
1994. *Access to Genetic Resources: Policy and Institutional Issues*. African Round Table on Coordinated Arrangements for the Conservation and Sustainable use of Genetic Material, Material and Technology Transfer and Benefit Sharing. Nairobi, September 8–10.
1994. *Biodiversity Conservation and Technological Expectations: Emerging Challenges for Forest Sector Strategies in Sub-Saharan Africa*. Forest Sector Policy Seminar organized by the World Bank, Nairobi, April 7.
1994. *Public Policy and New Generic Technologies: The Case of Biotechnology in Sub-Saharan Africa*, "International seminar on Development Aid Policy Approaches to New Generic Technologies in Developing Countries" organized by the Swedish Agency for Research Cooperation with Developing Countries (SAREC), Stockholm, April 20–21.
1993. *Environment Technology and International Relations: Rethinking Development Assistance To Sub-Saharan Africa*. Seminar on "Technology Policy and Sustainable Development" organized by The Netherlands Advisory Council For Development Cooperation, Maastricht, The Netherlands, November 11–12.
1993. *Ecophilosophy and Parental Earth Ethics: On the Complex Web of Being*. World Conference on World Futures Studies Federation, Turku, Finland, August 22–28.
1993. *Technology for Sustainable Development: Challenges and Prospects for Africa*, Journalistic Attachment and Specialization Programme, United Nations Environment Programme, Nairobi, February 19.
1993. "Access to and Transfer of Technology": *Blind Alleys and Windows of Opportunity*, International Conference on the Convention on Biological Diversity: National Interests and Global Imperatives, African Centre for Technology Studies, Nairobi, January 26–29.
1992. *Environmentally Sound Technology Transfer and Capacity Building in Africa: Reforming Incentive Systems*, Seminar on The Rio Convention on Climatic Change: The New Regime and the Agenda for Research, Centre for International Climate and Energy Research-Oslo (CICERO), Oslo, November 29–December 2.

1992. *Public Policy Making in Kenya: Challenges and Options for Institutional Reform*. Lecture Delivered at the Senior Management Seminar, Kenya Institute of Administration, Nairobi, November 4.
1992. *Intellectual Property Rights: Perspectives on Traditional Medicine and Biodiversity Conservation*, Presented at the Symposium organized by Rainforest Alliance's Periwinkle Project in Conjunction with the New York Botanical Gardens Institute of Economic Botany held at Rockefeller University, January 24–25 (with Mohamed Khalil).
1991. *Environment, Technology and International Trade: Beyond Financial Additionality in Africa*, Seminar on International Trade and the Environment, Oslo, February 28–March 1.
1990. *Institutional Innovation and Technological Change: The Case for Policy Reform in Africa*, International Conference on Innovation, Stockholm, November 5–8.
1990. *Biotechnology Diffusion in Africa: A Status Review of Eastern and Southern Africa*, International Symposium on Biotechnology and International Trade: 1992 and Beyond, Maastricht, The Netherlands, June 22–24.
1990. *The Geopolitics of Technology in the 1990s: Learning from Local Innovations*, Occasion of the Announcement of the 1990 Innovations for Development Association (IDEA) Awards, Nairobi, May 23.
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