DR. BURNS, MIKE

Name of Organization:	South Africa's Council for Scientific and Industrial Research.
Profession:	Principal Researcher
Date of Birth:	31 October 1955
Years employed by Organization:	27 years
Nationality:	South African

PROFESSIONAL AFFILIATIONS AND POSITIONS

Research Fellow (Sustainability Science), Centre for International Development, Harvard University

Extraordinary Professor, Stellenbosch University. TsammaHub and PhD Transdisciplinary research programme in sustainability studies

Editorial Executive Committee, Ruffolo Curriculum in Sustainability Science, Harvard University

Past member and contributing Regional Editor, AAAS *Forum on Science and Innovation for Sustainable Development* (retired)

Professional Natural Scientist, South African Council for Natural Scientific Professions (Reg No. 400298/06)

CAREER HISTORY

For almost three decades I have been employed by South Africa's Council for Scientific and Industrial Research (CSIR). Currently, I serve in the leadership cadre of the Environmental Management Services group, which is administered by CSIR's Consulting and Analytical Services Unit.

Until recently, I was placed within the organization's Natural Resources and the Environment (NRE) Operational Unit where I held the position of Research Fellow and served on NRE's Research Advisory Panel. I also managed one of NRE's research sub-units, the *Sustainability Science Research Group*. In this position, I was tasked with the design of the group's sustainability science research programme, to materially contribute to the research undertaken by the group and to manage the overall process of integrating sustainability science research philosophy into the wider CSIR.

My 2007/08 appointment as a Harvard University Research Fellow in the field of sustainability science, and my continued relationship with Harvard University, provides some measure of how the research programme that I have managed is perceived internationally.

I served for almost a decade as Manager of CSIR's Environmental Assessment and Management (EA&M) group – a predecessor of CSIR's Environmental Management Services group. CSIR's activities in this field were, and still are, distributed across the *research, development and implementation* (RDI) continuum.

In the *research* field I have directed a number of fundamentally important initiatives that have built CSIR's profile locally and internationally. This includes my PhD research, which investigated the correlation between the disciplines of environmental ethics and environmental impact assessment (a topic that still has strong purchase in contemporary deliberations located at the nexus of ESHIA, sustainability analysis and development) and more recently relating to sustainability science (including the applied field of social-ecological systems modelling and resilience analysis).

Significantly, it is CSIR's contribution within the *development* and *implementation* aspects of the RDI continuum in EA&M, which explains the organization's widely respected status. Under my leadership and/or involvement in the organisation's leadership cadre, CSIR has achieved and maintained an impressive track record in the application of EA&M theory in practice [e.g. Environmental Impact Assessment (EIA), Strategic Environmental Assessment (SEA), State of Environment Reporting, Environmental Liability Assessment and Sustainability Assessment]. This has positioned CSIR as a preferred provider of scientific support for many complex development projects undertaken in South Africa, elsewhere on the continent, and globally. Building on my Harvard Fellowship research, which has

seen the publication of Southern Africa's leading text on sustainability science (Burns and Weaver, 2008), this has increasingly been based on social-ecological systems modelling and the resilience analysis of such systems.

It is on the basis of the above (and a much wider organizational) track record to which I have contributed in a leadership position, that CSIR is valued and employed, for example, by the World Bank, African governments and major players in the industrial and resources sectors (e.g oil companies such as Tullow, Chevron, Conoco Phillips, Shell and several others).

Much of my professional focus has been on Central and West Africa's oil and gas sector. In this latter regard, I have played a fundamentally important role in building CSIR's relationship with the African Oil and Gas sector and supporting its contribution to sustainable development. Under my leadership CSIR has undertaken more than fifty EIAs for seismic, exploration drilling, production and product conveyance and storage in more than 10 African states. I have also led many other environmental initiatives that have informed developments within the oil and gas and energy sector, including, for example, environmental due diligence studies, geotechnical investigations and environmental performance monitoring. A few highlights in this respect include: My EIA leadership role in the current exploration activities of Tullow Oil in southern Ethiopia, which is possibly one of the most complex project environments from a social-ecological systems perspective; the highly complex pre-privatization environmental liability assessment of the Mauritanian electricity sector; the EIA of the Angola Liquefied Natural Gas project, which CSIR co-directed with another major international environmental consultancy; and the National Oil Spill Contingency Plan prepared for Cameroon (linked to the partially World Bank-funded Chad-Cameroon pipeline project). All of these projects have been underpinned by a variety of scientific disciplines and technology platforms (e.g. physical oceanography, marine and terrestrial ecology, hydrology, hydrogeology, numerical modeling, risk assessment, remote sensing and GIS).

Most recently, in the resources sector (platinum) and strategic port planning, I have played a foundational role incorporating novel concepts such as social-ecological systems modelling and resilience analysis in the projects I have been involved in.

ENVIRONMENTAL ASSESSMENT PROJECT MANAGEMENT HISTORY

Project locations: I have been involved in environmental impact assessment in the following African countries: Ethiopia, Ghana, Mozambique, Angola, Gabon, Cameroon, Equatorial Guinea, Gambia, Mauritania, Seychelles and South Africa. I have also consulted in Uruguay, Russia and the Middle East.

Clients: I have consulted to the following major companies and institutions: Tullow Oil (Ethiopia and Gabon), Dana Petroleum, PetroSA, Strategic Fuel Fund (South Africa), Texaco[1], ChevronTexaco, Chevron (Angola), Rockover Oil and Gas (Gabon), ConocoPhillips (Cameroon), Perenco (Cameroon), Pecten/Shell (Cameroon), Société Nationale des Hyrocarbures (Cameroon), Turnberry Resources (Cameroon), Addax Petroleum (Cameroon), Devon Energy (Equatorial Guinea), Rodeo Oil and Gas, Glencore, Noble Energy, World Bank and the Governments of Cameroon and Mauritania.

Types of projects: Sustainability analysis and EIA for major resources development projects – mostly oil and gas, but also, recently, the platinum sector. EIA and SEA for major port development projects (Mozambique, Ghana, East London, Saldanha); Risk assessment for port-associated developments within the oil and gas sector; Seismic Surveys; Exploration drilling; Petroleum production and storage; Electricity Generation; and Liquefied Natural Gas production, storage and export.

Types of environmental assessment and knowledge transfer: Environmental Impact Assessment (EIA), Environmental Due Diligence, Environmental Liability Assessment, Oil Spill Contingency Planning, Sustainability Analysis, Development of Energy Sector Environmental Performance Standards and Regulations, Environmental and Social Baseline Descriptions, Environmental Monitoring, Training.

Specialist and coordination functions: Stakeholder Engagement (Government, private sector, NGOs, local, communities), Livelihoods Analysis, Social Vulnerability Analysis, Terrestrial Ecosystems Mapping and Conservation Importance Analysis (typically using remote sensing technologies), Marine Water Quality Monitoring (repeat surveys using bio-indicator species as a proxies for establishing long-term water quality status), Physico-chemical Estuarine Water Quality Modelling, Analysis of Living Marine Resources, Benthic Ecosystem Surveys, Mangrove Ecosystem Surveys, Shoreline Sensitivity Mapping, Soil and Groundwater Monitoring, Physical Oceanography (overview and interpretation), Hydrodynamic Modelling (transport and fate of pollutants), Oil Spill Simulation Modelling,

[1] Some of these company names are legacy structures now incorporated into new merged structures

Recent project track-record

- Environmental Impact Assessment: 2-D seismic survey, Bakassi West Block, Cameroon: Dana Petroleum Cameroon.
- Environmental Impact Assessment: Exploration Drilling, Sabisa-1 well, South Omo Block, Ethiopia: Tullow Oil, Ethiopia
- Environmental Impact Assessment: Exploration Drilling, Tultule-1 well, South Omo Block, Ethiopia: Tullow Oil, Ethiopia
- Best Practicable Environmental Option Analysis: Drill cuttings disposal, Sabisa-1 well, South Omo Block, Ethiopia: Tullow Oil, Ethiopia.
- Oil spill risk analysis, Saldanha Bay: MOGS
- Environmental Impact Assessment: Exploration Drilling, Azobe Block, Gabon: Tullow Oil Gabon
- Environmental Impact Assessment for Oil Exploration Drilling Operations: Glencore, Bolongo Block, Cameroon
- Environmental Impact Assessment for Oil Exploration Drilling Operations: Glencore, Matanda Block, Cameroon
- Environmental Impact Assessment for Oil Exploration Drilling Operations: Noble Energy, Tilapia and Yoyo blocks, Cameroon
- Environmental Impact Assessment for Oil Exploration Drilling Operations: Yan Chang, Zina Block, Cameroon
- Environmental Impact Assessment for Oil Exploration Seismic Survey Operations: Glencore, Bolongo Block, Cameroon
- Environmental Impact Assessment for Oil Exploration Seismic Survey Operations: Glencore, Matanda Block, Cameroon
- Environmental Impact Assessment for Oil Exploration 3-D Seismic Survey Operations: Addax Petroleum Cameroon, Ngosso Permit, Cameroon
- Environmental Impact Assessment for Oil Exploration Drilling Operations: Addax, Ngosso Permit, Cameroon
- Environmental Impact Assessment for Development, Production and Pipeline Building Activities: Rodeo, Logbaba Gasfield, Cameroon
- Environmental Impact Assessment for Gas Exploration/Appraisal Drilling Operations: Rodeo, Logbaba Gasfield, Cameroon
- Environmental Screening Study: Proposed Deepwater Port and Associated Industrial Development Zone for Ghana: Rent-A-Port and PMI, Ghana
- Environmental Screening Study: Proposed Deepwater Port, Ponta Dobela, Mozambique.
- National Oil Spill Contingency Plan for Cameroon: World Bank Contract, Chad-Cameroon pipeline project
- Oil spill risk and response analysis: PetroSA, Coega Refinery, South Africa
- Environmental Impact Assessment for Oil Exploration Drilling Operations: Perenco, Block PH-69, Cameroon.
- Environmental Impact Assessment for Oil Exploration Drilling Operations: Phillips Petroleum Cameroon, Block PH-77, Cameroon.
- Environmental Impact Assessment for Oil Exploration Seismic survey Operations: Phillips Petroleum Cameroon, Block PH-77, Cameroon.
- Environmental Impact Assessment for Oil Exploration 2-D Seismic Survey Operations: Addax Petroleum Cameroon, Ngosso Permit, Cameroon.
- Environmental Impact Assessment for Oil Exploration Drilling Operations: Perenco Cameroon S.A., Block PH-69, Cameroon.
- Environmental Impact Assessment for Oil Exploration Drilling Activities: SNH Cameroon, Hinale-1 well Cameroon.
- Environmental Due Diligence: ChevronTexaco's Angola LNG project, Soyo, Angola
- Supplemental Data Acquisition Programme: Angola LNG project, Soyo, Angola.
- Environmental Due Diligence: Texaco LNG Project, Luanda, Angola.
- Environmental Due Diligence/Audit: Middle Timan Bauxite Mine, Komi Republic, Russia.
- Environmental impact assessment of Bauxite Import Terminal: Mozal Matola Terminal, Maputo, Mozambique.
- Environmental liability assessment: Mauritania's main power stations (World Bank funded).
- Formulation of environmental regulations for the energy and water sectors (incl. marine water quality standards) for the Government of Mauritania (World Bank funded).
- Strategic environmental assessment of a corridor development in Uruguay, South America.
- Environmental Liability Assessment: SFF Association's South African Fuel Storage Installations: PetroSA pre-merger investigation.
- Environmental Impact Assessment of Proposed Expansion of Oil Transfer Operations: Port of Saldanha Bay, South Africa.
- Environmental Impact Assessment of Proposed Commercialization of Oil Storage Tank Farm: SFF, Milnerton, South Africa.
- Environmental Management Programme Coastal Mining Operations: Alexkor, Alexander Bay, South Africa
- EIA capacity building training courses (various; e.g. Ethiopia): World Bank

RECENT PUBLICATION RECORD[2]

Burns, M., Allsopp, N. and van Wilgen, B. (Eds) (2009). Global Change Grand Challenge: Background Information Document for South Africa's National Science Plan. (Pretoria, Department of Science and Technology).

Burns, M. and Weaver, A. (Eds) (2008). *Exploring sustainability science: A southern African perspective*. (Stellenbosch, AFRICAN SUN MeDIA).

Burns, M. and Weaver, A. (2008). Introduction: Exploring sustainability science from a southern African perspective, in: M. Burns and A. Weaver (Eds), *Exploring sustainability science: A southern African perspective*. (Stellenbosch, AFRICAN SUN MeDIA).

Andersson, K., Burns, M. Bursztyn, M., Henry, A. D., Laudati, A., Matus, K. and McNie, E. (2008). The RuffoloCurriculum on Sustainability Science: 2008 Edition. CID Graduate Student and Research Fellow Working Paper No. 32. Center for International Development at Harvard University, December 2008.

Burns, M. (2007). Resilience theory as an approach to sustainability analysis. *International Journal of Environmental, Cultural, Economic and Social Sustainability* Vol. 3

Burns, M. (2007). Sustainability science: Bridging the knowledge producer-user divide. *South African Journal of Greenbuilding*. Available online at: http://www.greenbuilding.co.za

Muller, E. and Burns, M. (2007). Indicators: Are we on the right track? in: K. Govender and M. Audouin (Eds), *Enhancing the effectiveness of SEA in South Africa*. CSIR Report CSIR/NRE/RBSD/EXP/2007/0068/A. (Pretoria, CSIR). Pages 75-83.

Wright, A. and Burns, M. (2007). Trade-offs: What to choose and what to lose, in: K. Govender and M. Audouin (Eds), *Enhancing the effectiveness of SEA in South Africa*. CSIR Report CSIR/NRE/RBSD/EXP/2007/0068/A. (Pretoria, CSIR). Pages 84-102.

Burns, M., Audouin, M. and Weaver, A. (2006). Advancing sustainability science in South Africa. *South African Journal of Science* 102: 379-384.

Burns, M.E.R. and Hattingh, J.P. (2006). Locating policy within the taxonomy of sustainable development. *South African Journal of Environmental Law and Policy* 13(1). in press.

RECENT SYMPOSIA AND CONFERENCE PRESENTATIONS[3]

Burns, M. (2009). Exploring sustainability science: A southern African perspective. Invited paper presented at the 2009 International Conference on Sustainability Science, Tokyo, Japan, 5 – 7 February 2009.

Burns, M. (2008). Building research capacity in sustainability science. Keynote paper presented at the International Foundation for Science Advisers Forum, Antananarivo, Madagascar, 9 May 2008. (Presentation available on IFS website).

Burns, M. and James, G. (2008). Impact of the petroleum sector on the resilience of the Niger delta social-ecological system. Paper presented at the Annual Meeting of the Association of American Geographers, Boston, Massachusetts, 12-19 April 2008. Abstract available online at: http://communicate.aag.org/eseries/aag_org/program/AbstractDetail.cfm?AbstractID=15893

Burns, M.E.R. (2007) Resilience theory as an approach to sustainability analysis. 3rd Int. Conf. on Env. Cultural, Econ. and Social Sustainability. 4 - 7 January, 2007. Univ. of Madras, Chennai, India.

[2] Since retirement from the CSIR, my focus has been more on consulting than publishing and presenting research

[3] See above footnote

Burns, M.E.R. (2005). Managing natural resources for sustainability in artisanal and small-scale mining communities. 5th Annual General Meeting and Learning Event. Building Sustainable Communities through Small-scale Mining. Salvador, Bahia, Brazil. World Bank/DFID.

Burns, M.E.R. (2005). Africa's oil and gas sector: Switching allegiance from a conservative to an enlightened interpretation of sustainable development. Oil and Gas Africa 2005 conference. 22-24 February 2005. Johannesburg, South Africa.

Burns, M.E.R. (2004). Cameroon's oil and gas industry: Controlling project environmental performance beyond EIA. 24th Ann. Conf. International Association for Impact Assessment. 24-30 April 2004, Vancouver, Canada.

RECENT SEMINAR AND CURRICULUM PRESENTATIONS

Burns, M. and James, G. (2008). Impact of the petroleum sector on the resilience of the Niger delta social-ecological system. Seminar presentation, Harvard University Sustainability Science Programme, April 2008.

Burns, M.E.R. (2007) Transdiciplinarity and knowledge integration. Sustainability Science Curriculum Presentation. Harvard University Sustainability Science Programme, 27 November 2007

Burns, M.E.R. (2007) Resilience and vulnerability. Sustainability Science Curriculum Presentation. Harvard University Sustainability Science Programme, 9 October 2007.

Burns, M.E.R. (2007) Resilience analysis of Africa's oil and gas sector. Seminar presentation, Harvard University Sustainability Science Programme, September 2007.

Burns, M.E.R. (2006). The impact of Africa's oil and gas sector on social-ecological system resilience. Lecture presented to Arizona State University's IGERT program and the University of Wisconsin's Sustainability and the Global Environment (SAGE) Research Center.

QUALIFICATIONS AND ACADEMIC POSITIONS HELD

2011 - current	Professor (extraordinary) School of Public Policy and Management, Stellenbosch University, South Africa
2002	D.Phil. Environmental Philosophy, University of Stellenbosch, South Africa. Doctoral dissertation describes the co-evolutionary relationships between environmental assessment and environmental ethics.
1987	M.Sc. Plant Science, Rhodes University, Grahamstown, South Africa. Dissertation focuses on the synecological characteristics of South Africa's sub-tropical dune forests.
1978	B.Sc. Forestry, University of Stellenbosch.

EMPLOYMENT RECORD

2008 – 2014	**:** South Africa's Council for Scientific and Industrial Research (since 2012, as a consultant to the organisation)
2007/08	**:** Giorgio Ruffolo Research Fellow in Sustainability Science, Harvard University
1986-2007	**:** South Africa's Council for Scientific and Industrial Research
1978-1986	**:** South Africa's Department of Forestry: Conservation planning and management, St Lucia, KwazuluNatal and the Eastern Cape.

LANGUAGES

Language	Speaking	Reading	Writing
English	Excellent	Excellent	Excellent
Afrikaans	Excellent	Excellent	Excellent
French	Fair	Fair	None

Mike BURNS