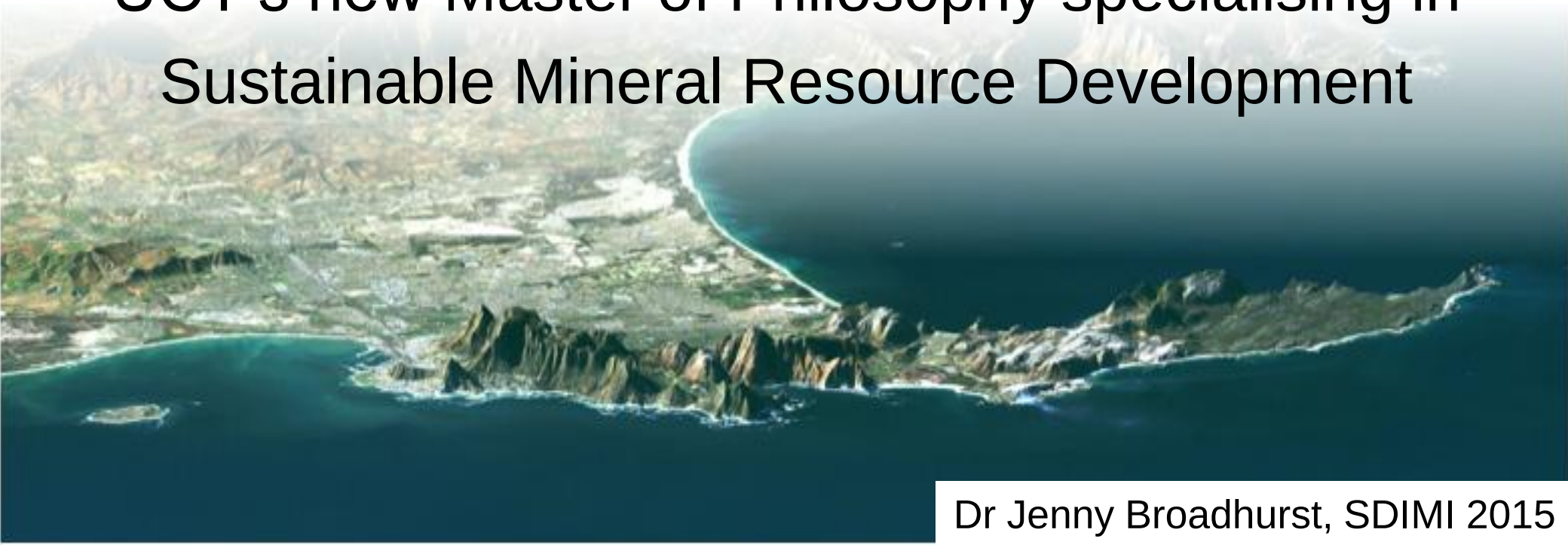
UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD

Educating Managers and Leaders for Sustainable and Socially Responsible Mining in Africa

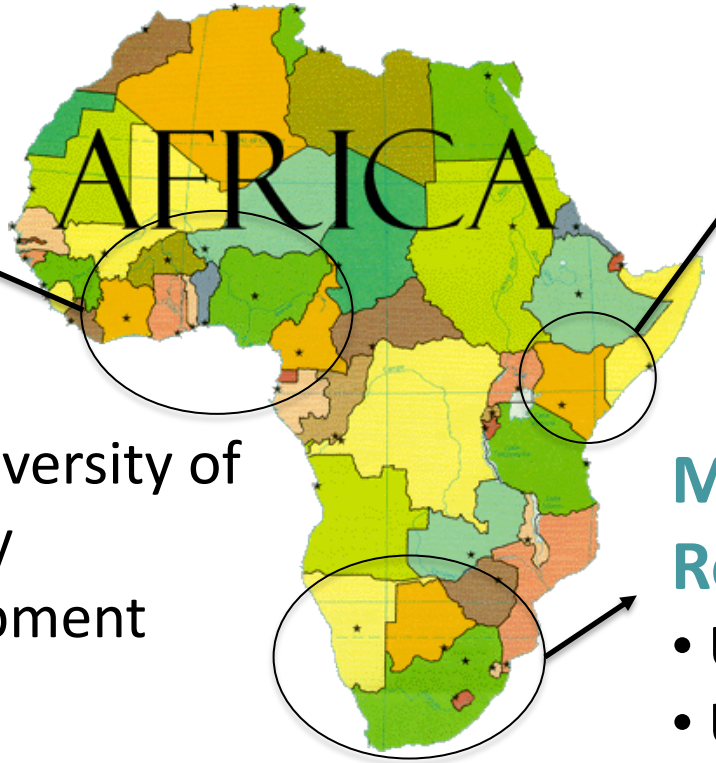
UCT's new Master of Philosophy specialising in Sustainable Mineral Resource Development



Dr Jenny Broadhurst, SDIMI 2015

So how did it come about?

Education for Sustainable Development in Africa (ESDA) Initiative



Sustainable Rural Development

- University of Ibadan
- University of Ghana
- Kwame Nkrumah University of Science & Technology
- University of Development Studies

Sustainable Urban Development

- Kenyatta University
- University of Nairobi

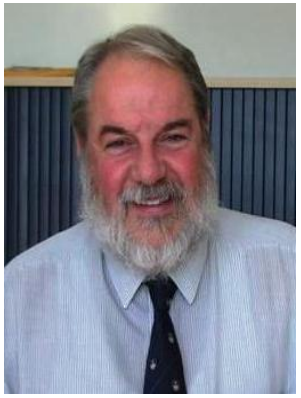
Mining & Mineral Resources (MMR)

- University of Cape Town
- University of Zambia

United Nations University
Institute for Sustainability and Peace


Symposium & Workshop on Education for Sustainable Development in Africa
UNITED NATIONS UNIVERSITY
Date: 1st - 2nd March, 2010
Venues: Silver Springs Hotel & United Nations Office, Gigiri, Nairobi
KENYATTA UNIVERSITY
UNEP
UN-HABITAT
UNESCO

MMR programme coordinators



Prof J-P Franzidis
Emeritus Professor: Minerals to Metals, UCT

Prof Sue Harrison
Centre for Bioprocess Engineering Research, UCT

Prof Harro von Blottnitz
Environmental & Process Systems Engineering Group, UCT

Dr Jenny Broadhurst
Acting Director: Minerals to Metals, UCT

Prof Stephen Simukanga
Vice Chancellor: UNZA

Dr Jewette Masinja
Head: Dept of Metallurgy & Mineral Processing, UNZA

Programme rationale

- Mineral wealth has the potential to serve as a vehicle for significant economic growth, but there are challenges
- A sustained programme of research and human capacity development is essential in meeting sustainability challenges facing the mining industry
- Of key importance is the need to generate managers and leaders, who have an understanding of the critical & inter-related issues involved and a sensitivity on how to project such in the context of different stakeholders

Aims & approach

- Integrate critical and inter-related factors for sustainable development in the context of mining and minerals beneficiation
- Provide opportunity to experiment with real-life case studies
- Bring together a diverse cohort of students from across a spectrum of disciplines
- Review and piloting of existing courses by three master's students: UCT, UNZA and Kyushu University

The new Master's degree programme

Master of Philosophy (MPhil)

specialising in

Sustainable Mineral Resource Development

offered at the

University of Cape Town (UCT)

and the

University of Zambia (UNZA)

Curriculum content

Course Description	Convening Institute	Credits
Introduction to Sustainable Development	Sustainability Institute, US	16
Strategic Social Engagement Practice	GSB, UCT	16
Environmental Stewardship in Mining & Minerals Beneficiation	School of Mines, UNZA	12
Research Communication & Methodology	EBE Faculty, UCT	16
Practical Training in SD/Internship	EBE Faculty, UCT	0
Master's Dissertation	EBE Faculty, UCT	120

1 credit is equivalent to 10 hours, with 1/5 hours as contact time

Introduction to Sustainable Development

- Professor Mark Swilling and Eve Annecke, Sustainability Institute at University of Stellenbosch
- How can the extraction, use and disposal of resources be reorganized to ensure greater levels of social equity, and the long-term survival of the eco-systems that sustain all life?

"Excellent, dynamic, life-changing, emergent"

"Made you hang out deeply"

Strategic Social Engagement Practice

- Convened by Corporate Learning Department at the UCT Graduate School of Business
  - Elspeth Donovan, A/Prof Chris Breen, Prof Ralph Hamann & A/Prof Mills Soko, guest lecturers
- How to engage with and manage the relationships between an organization and the communities and other social partners that populate its context?
  - Managing relationships and conflicts; the challenge of collaboration; the practice of dialogue; tensions and innovation (dealing with wicked problems); developing inclusive business models

Environmental Stewardship in Mining & Minerals Beneficiation

- New course at UNZA School of Mines, Lusaka
  - convened by Dr Jewette Masinja, with guest lectures from UCT
- Principles, criteria and practices for environmentally conscious development of mineral resources
  - cradle-to-grave mine design; cleaner production, eco-efficiency; industrial ecology; material stewardship , mine waste impacts & management, carbon neutrality, life cycle analysis, legislation.
- Mine site visit and case study

Research Communication & Methodology

- Modified course at the Faculty of Engineering & Built Environment, UCT
  - Professor Sue Harrison, Prof J-P Franzidis, Dr Jenny Broadhurst, guest lecturers
- How to execute meaningful research in a structured way, and report the results?
  - Literature review & writing skills
  - Research philosophy, methodologies & planning
  - Hypothesis development & research communication
  - Synthesis & application of programme learnings

The first student cohort (2014/2015)

- 15 students – 8 at UCT, 7 at UNZA
- 4 chemical engineers, 3 foresters, 2 lawyers, 2 mining engineers, 1 geologist, 1 geographer, 1 economist, 1 social anthropologist
- Represent 3 African countries & Australia
- 8 males, 7 females
- Ages 21 to 51

Research topics

- Community involvement in rehabilitation of degraded mine land
- Performance analysis & decision-making frameworks for mineral value chains
- Life cycle based indicators for eco-efficient processing of PGMs
- Entrepreneurship in communities around the mining & minerals beneficiation
- Measuring the sustainability signature of mining assets by integrating models
- A systemic approach to mining accident causality analysis
- Legal frameworks for encouraging sustainable communities post mining
- Broader implication of deforestation by mining companies
- Downstream uses of mine wastes: opportunities, challenges & implications
- Reconciling different stakeholders: A Zambian case study
- Challenges & opportunities for revenue collection from mining companies
- The effectiveness of EIA protocols and legislation in relation to mining

The second student cohort (2015/2016)

- 18 students- 10 at UCT, 8 at UNZA
- 1 mechanical engineer, 4 mining engineers, 1 civil engineer, 2 chemical engineers, 1 mineral processing engineer, 3 geologists, 1 forester, 1 lawyer, 2 social scientists, 1 psychologist, 1 business analyst
- Represent 4 African countries, Australia and Japan
- Middle to senior management: government, mining houses, consultancies, communities

Towards developing integrative knowledge

The Big Questions

- What were the key take-home messages from the courses and how are related?
- How can this integrative knowledge be used to develop an understanding of challenges and required responses to selected problems?

Selected Outcomes

- Enhanced self-awareness and personal growth
- Speaking a common language
- Respect for other viewpoints and perspectives

So what did the students learn?

- Understanding the complexity and inter-related nature of sustainability challenges
- The need for value-based leadership and governance
- Creating shared value as a business model
- Constructive and inclusive stakeholder engagement
- Respect for nature (deep ecology)
- Effective planning & monitoring – Go slowly upfront
- Adopt systemic perspectives and principles

Concluding remarks

- Students:
  - ✓ integrated learnings from different courses
  - ✓ developed a new appreciation of the complexity of sustainable mineral resource development
  - ✓ Recognised the need for value-based leadership and governance
- Academic staff: enhanced engagement with academics from other disciplines and external organisations
- University: new trans-disciplinary research activities and partnerships

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Thank you for your attention