Africa is a diverse and resources-rich continent: It hosts an estimated 30 per cent of global mineral reserves and several of the fastest growing economies.

Over 200 Australian exploration and mining companies operate in Africa.

Australia is a significant resources-led economy, and – through private sector, government, NGOs and universities – is partnering in Africa to create long-term, sustainable benefits to communities throughout the continent.
WA’s capital Perth is recognised as a mining knowledge hub supporting Australia’s vast investments in Africa. The University of Western Australia (UWA) continues to build its strategic African engagement.

UWA’s Energy and Minerals Institute (EMI) connects UWA’s talent and capability across the energy and minerals value chain, builds multidisciplinary networks and strengthens partnerships with industry and external stakeholders. Guided by a Board of Trustees of key industry leaders, EMI leads UWA’s engagement in key collaborations and provides strategic business development, governance, engagement and consultancy services across UWA.

This includes long-standing UWA Centres like the Australian Centre for Geomechanics and the Centre for Exploration Targeting which have been providing education and research outcomes for over a decade in Africa. More recently, UWA Centres like the International Mining for Development Centre (iM4DC) and the Centre for Social Impact have turned their efforts to understanding and supporting economic development through the mining sector.

As knowledge-intensive and innovation-led institutions, universities are addressing major global challenges through pooling expertise across disciplines and working collaboratively across borders.

UWA is a member of the Worldwide Universities Network (WUN) and the Australia-Africa Universities Network. WUN is a group of 19 research-intensive universities and spans 11 countries across six continents. They facilitate collaborative research and the exchange of research staff and students and bring together the expertise necessary to address issues that impact the planet and its people. This brochure highlights some of UWA’s researchers collaborating with partners in Africa.
Lifting the Quality of Life through Skills Development for Mining

In partnership with the Australian Government, UWA through its Energy and Minerals Institute (EMI) and The University of Queensland through its Sustainable Minerals Institute (SMI), have established the International Mining for Development Centre (IM4DC) to assist in lifting the quality of life in developing nations through a more sustainable use of mineral and energy resources.

Since commencing operations in 2011, IM4DC has conducted over 80 training courses and workshops across Africa, targeting key personnel within government, universities, research institutions and non-government organisations to bring about: improved policies and practices in the governance and management of mining industries and their interactions with society and the environment; improved legislative frameworks; improved knowledge of a country’s resources base; and the ability to build local capacity in minerals governance and mining.

Mr Ian Satchwell
ian.satchwell@im4dc.uwa.edu.au
International Mining for Development Centre - www.im4dc.org
Geophysics of the First Water

Water scarcity poses one of the most significant development challenges on the African continent, where 345 million people are without access to potable water. Non-governmental organisations (NGOs) are continuously trying to raise funds that will cover the costs of drilling boreholes in an attempt to access potable water that may be running below the surface. But without incorporating geophysical and geologic observations, they may miss the spot by as little as 100m and deliver unusable, salty water.

UWA’s Woodside Professor of Computational Geoscience Jeffrey Shragge believes the only way to make long-term changes is to give local geoscience professionals and students the tools to be able to conduct geophysical surveys themselves.

A grant from the Society for Exploration Geophysics (SEG) Foundation allowed him to conduct a pilot study with physics students from Jomo Kenyatta University for Agriculture and Technology in Kenya, where he not only taught geophysics classes to the students but also took them in the field to look for groundwater.

Associate Professor Shragge is an advocate for establishing a sustainable geophysical field camp based out of the Kenyan university to create a win-win-win situation: a win for the students, a win for the community and a win for the resource companies who would have a greater pool of local geoscientists to recruit.

Assoc/Prof Jeffrey Shragge  
School of Earth and Environment  
School of Physics  
jeffrey.shragge@uwa.edu.au

Enhancing Exploration Potential in West Africa

The West Africa Exploration Initiative (WAXI) is a 50-organisation strong public-private-partnership research and training program. Founded in 2005 by UWA’s Professor Mark Jessell, the not-for-profit initiative was established to provide exploration companies with the information required for optimal exploration success.

Bringing together major stakeholders in West Africa’s mineral exploration industry, WAXI assists exploration companies to focus their activities in highly-prospective areas such as the West African Craton.

The program operates in 9 countries (Ghana, Burkina Faso, Ivory Coast, Niger, Liberia, Senegal, Sierra Leone, Mauritania, Mali, Togo and Guinea) and has already delivered training to postgraduate students and post doctoral fellows (>40), research and management courses (>15), and new exploration knowledge from research, providing industry with the know-how to better manage their country’s resources.

W/Prof Mark Jessell  
Centre for Exploration Targeting (CET)  
School of Earth and Environment  
mark.jessell@uwa.edu.au
Sustainable Mining for the Future

UWA’s Centre for Social Impact prepares for Africa’s essential role in global mining

The UWA Business School Centre for Social Impact (CSI) is part of a national initiative that aims to create beneficial social impact through teaching, research, measurement and promotion of public debate. The Centre brings together the business, government, philanthropic and third (not-for-profit) sectors, in a collaborative effort to build community capacity and generate social innovation.

Supported by the Australian Department of Foreign Affairs and Trade (DFAT), CSI’s Director Winthrop Professor Paul Flatau and his team have published a report ‘New curriculum options for sustainable mining for community and economic development’ which aims to assist the development of teaching programs on sustainable economic and social development models for mining industries in Africa and overseas.

Like other reports relating to the mining sector prepared by CSI this one has a strong focus on Corporate Social Responsibility (CSR), community investment and community impacts of mining, and is informed by CSI’s extensive reach and collaboration with indigenous communities.

As mining investments continue to expand in Africa, strategies that maximise sustainable social and economic outcomes and CSR practices will become increasingly relevant.

The UWA CSI, along with the School of Indigenous Studies, hosts the Indigenous Business, Enterprise and Corporations Conference (iBECC) which in 2014 attracted well over 500 people to UWA over two days. iBECC is now recognised as the most important Indigenous business conference in Australia.

W/Prof Paul Flatau  
Centre for Social Impact  
paul.flatau@uwa.edu.au
More Time on the Computer to Help Improve Food Security in Africa

Knowledge generated (on the iVEC Supercomputer ‘Magnus’) by UWA Computational Biologist, Dr Laura Boykin, is providing new insights of great value to African farmers looking for ways to specifically target whiteflies (*Benisia tabaci*), a highly invasive pest causing food insecurity and millions of dollars of damage each year due to crop loss. These whiteflies are particularly hazardous in sub-Saharan Africa where they devastate vegetables, cassava and sweet potato yields.

Boykin’s computational work, known as species delimitation, distils how individuals and various populations of whiteflies fit into natural groups. Importantly, she connects the work of other scientists such as evolutionary biologists and identifies how the information can be integrated to make informed decisions about global biosecurity.

This information gives farmers insight into how to specifically target the whiteflies before they can cause mass devastation.

Dr Laura Boykin
Plant Energy Biology
laura.boykin@uwa.edu.au
www.lauraboykinresearch.com

Assessing the Economics of Poverty-Reducing Aid

International institutions such as the International Monetary Fund (IMF) and the World Bank have provided financial aid and low-interest loans to boost the African farming industry for decades now. After all, rural welfare and economic growth are heavily influenced by agricultural productivity. But have these measures had an impact on agricultural productivity?

This important question has been tackled by UWA’s Assistant Professor Amin Mugera and colleagues. Specifically, they explored the relationship between macroeconomic policy reforms, dubbed the structural adjustment programs (SAPs), and agricultural productivity growth across 33 African countries by examining statistics from 1981 to 2001. Their analysis took into consideration other important factors that influence productivity, such as natural resources, infrastructure, and effects of globalisation and civil violence. Their findings showed that countries which implemented the macroeconomic policy reforms achieved higher agricultural productivity compared to those which did not.

Given that many countries rejected the policy reforms instituted by the IMF and World Bank in the initial stages and only implemented them after they became prerequisites for receiving financial aid, the study provides strong support for linking financial aid to the implementation of macroeconomic policies.

Asst/Prof Amin Mugera
School of Agricultural and Resource Economics
amin.mugera@uwa.edu.au
There is consensus amongst climate scientists that climate change is happening. Marine scientists from the University of Cape Town and UWA are exploring the impact of climate change on the marine environment, through their research into the ecology of kelps. These large seaweeds are critically important to temperate coastal ecosystems in both South Africa and Western Australia.

Through their comparative experiments, Associate Professor Thomas Wernberg and colleagues are documenting how temperature and plant characteristics affect the ability of kelps to succeed in different and changing environments.

The successful partnership between these two coastal nations has led to new insights and positioned this team of researchers among global leaders in kelp research.

Assoc/Prof Thomas Wernberg
UWA Oceans Institute
thomas.wernberg@uwa.edu.au
http://wernberglab.org
Improved Mining Legislation to Benefit Developing Countries

Mining legislation can have a huge impact on a country’s resource management, and a researcher at UWA’s law school is working to bring about better legal options for regulating the mining sector in Africa.

Associate Professor Takele Soboka Bulto is an expert in international human rights law and environmental law and is pushing for reforms that will safeguard Africans’ right to fresh water and make foreign companies more responsible for using environmental and natural resources in a safe, sustainable way.

He works within a global consortium of academics and Human Rights organisations, ‘Extraterritoriality Consortium’, on clarifying the extraterritorial responsibilities of a company’s home country regarding human rights violations that their multinational companies cause overseas.

Associate Professor Bulto’s research explores how a company’s home country can promote a human rights-based approach, ensuring the company follows sustainable and environmentally sound practices in their overseas activities.

His focus on clarifying ways how this could be achieved represents a new direction in research and a solid foundation for improved collaboration and shared stewardship between companies, host countries and home countries.

Assoc/Prof Takele Bulto
UWA School of Law
takele.bulto@uwa.edu.au

Reaching for the Stars

South Africa and Western Australia to host the largest radio telescope in the world.

The Square Kilometre Array (SKA) will be the largest radio telescope the world has seen and UWA researchers at the International Centre for Radio Astronomy Research (ICRAR) are part of this groundbreaking research project.

Employing a wide range of technologies, the SKA will consist of several thousand smaller telescopes co-hosted between Africa and Australia. Within each site, these dishes and antennas will be electronically connected.

Sharing the SKA between Africa and Australia allows the project to benefit from the best of both sites and leverage from the substantial investment in infrastructure that both locations already have in place. A model example of collaboration to achieve maximum benefit, the project builds on strengths of Australian astronomy to survey large portions of the sky quickly and is complemented by South Africa’s dish-shaped telescopes designed to observe smaller sections of the sky in more detail.

Information gathered by the SKA will be used by scientists to investigate fundamental questions about the universe and will open new and unchartered areas of understanding.

Prof Lister Staveley-Smith
Deputy Director, Science/CAASTRO
Deputy Director International Centre for Radio Astronomy Research (ICRAR)
lister.stavely-smith@uwa.edu.au
www.icrar.org
Correct the Diagnosis and Save a Child’s Life

Acute fever is one of the leading causes of hospitalisation and death in West Africa and for a very simple reason: incorrect diagnoses. Historically, tropical childhood fevers are thought to be caused by malaria; however we now know this is not true. The majority of cases are in fact caused by non-malarial infections.

Current tests are limited and an incorrect diagnosis means that a child is unlikely to survive their illness.

UWA’s Dr Saskia Decuypere is developing a simple diagnostic tool that will change the statistics.

Using her expertise in metabolomics, the tool will be an easy-to-use bedside test that will allow healthcare workers to determine there and then whether a child is suffering from malaria, a bacterial infection, or both.

The rapid diagnostic test will provide a powerful tool for medical staff; they will be able to prescribe more targeted treatment and accurately treat these serious diseases.

Dr Saskia Decuypere
School of Paediatrics and Child Health
saskia.decuypere@telethonkids.org.au

Building greater engagement with Africa

With many African states experiencing a natural resources boom and impressive levels of economic growth, countries from all over the world are working on strengthening their engagement with the African continent.

Assistant Professor David Mickler, from UWA’s Political Science and International Relations Program, has been examining Australia’s own ‘new engagement’ with Africa, and has identified a range of factors which have shaped the way the Australian government has tried to develop relationships with African governments and institutions and position itself in this emerging market.

These factors include substantial resources sector investment from Australia and interest in managing a range of ongoing humanitarian, security and governance challenges that have both local and international implications. Deeper engagement has been constrained by Australia’s relative lack of ‘visibility’ and existing networks in Africa, under-investment in its diplomatic footprint on the continent, and low levels of knowledge about Africa at home.

Assistant Professor Mickler has introduced two new Africa-focused units at UWA to help build the knowledge base required for deeper and more sustainable engagement with the African continent.

Assist/Prof David Mickler
Political Science and International Relations
david.mickler@uwa.edu.au
Enhancing leadership in Kenya

Having strong, focused and value-driven leaders is important not only to mining in Africa but across all facets of industry, government and academia.

UWA’s Accelerated Learning Laboratory (ALL@UWA) is a world-class facility for developing leaders at all levels in all types of organisations.

ALL@UWA is engaged with a number of organisations in Kenya to advance the leadership among participants with a diverse range of backgrounds, including government officials, university leaders and private sector managers.

The innovative project has been rolled out in partnership with the Business School at Strathmore University and the Female Future Programs at the Federation of Kenya Employers.

As part of the study, ALL@UWA has designed and provided rigorous, 360-degrees leadership capability assessment for participating managers focused on behaviours shown to be critical for leadership effectiveness and performance.

Results from the assessments not only help to enhance self-awareness of Kenyan leaders - an important step in personal and leadership development - but also help strengthen ALL@UWA’s overall research programs on leadership, work performance and gender differences in the workplace, among others.

Dr Lena Wang
Accelerated Learning Laboratory
lena.wang@uwa.edu.au