

Riding the waves of opportunity from Limpopo to Europe

Born in a small village, Ha-Makhitha in Limpopo, he studied at some of Europe's best universities. Now Abel Ramoelo is back to make a difference and share his knowledge with the rest of South Africa's geo-information science and earth observation community.

MOST OF US HAVE SEEN IT. Few of us believe it and live it. It's a popular wall poster adorning many corporate offices. In the middle, a photo of arid agricultural land clearly in need of rain. Below the picture, the word **Opportunity** grabs your attention. This is followed by the phrase: "At the heart of every difficulty, lies opportunity." Abel Ramoelo, researcher within the CSIR earth observation (EO) research group, lives by this philosophy.

From humble beginnings, Abel has accomplished much in his relatively short life to date. The 26 year-old recently obtained his Master's degree in geo-information science (GIS) and earth observation (EO) for environmental modelling and management.

The degree was made possible by a scholarship from the European Union's Erasmus Mundus programme, which was granted while he was working as junior researcher at the CSIR in 2005.

Abel grew up in Ha-Makhitha village in the Limpopo Province, where he completed his elementary and senior schooling. In grade 11, he won a mathematics olympiad, the Kentucky Bursary Fund, bagging prize money of R750 for his efforts. As a sign of early maturity and clear ambition, he spent most of that money on postage costs applying to universities.

Financial constraints were to prevent him from going to any university until two years later. Ramoelo was undeterred.

In 2000, following what Abel refers to as a "concerted savings effort by my mother, aunt and uncle", he enrolled for a Bachelor's degree in environmental sciences at the University of Venda. He graduated top of his class and was named the best student in the School of Environmental Science. He obtained his BSc Hons in environmental science in 2003, passing with distinction.



Abel Ramoelo



The latest in GIS and EO - Abel Ramoela using an analytical spectral device (ASD) field spectroradiometer to collect field spectra. The spectroradiometer collects electro-magnetic (light) energy reflected from a target in the visible, near-infrared and shortwave-infrared domains. These data are used to simulate air and spaceborne remote sensing data towards assessment of vegetation systems, e.g. gauging plant water, nutrient and disease stress and for applications such as species differentiation

Having first heard about the CSIR in 2004 when the organisation's representatives visited his university, Abel started at the CSIR in 2004 as a junior researcher. A year later he was off to Europe to study for his Master's.

"I had been doing research on a suitable Master's project when my then research leader, Humbulani Mudau, informed me of a scholarship offered by the EU Erasmus Mundus programme," Abel recalls. "I did not hesitate to apply and fortunately, I was accepted," he adds.

Abel made his first European stop at the University of Southampton - United Kingdom - where he did some introductory courses. During this time he was chosen to represent South Africa at the 2005 International Youth Summit on Climate Change in Canada. By June 2006, he had crossed to Sweden, Lund University, where he undertook advanced courses in GIS and environmental modelling. He stayed there for a month before touching down in Poland for some field work at the University of Warsaw. His Master's was completed at the Dutch-based International Institute for GIS and EO in 2007.

His thesis, titled *An innovative method to map land cover changes at a country level utilising hyper-temporal satellite images: A case study of Portugal*, was among the best five out of a class of 28.

Now, back at the CSIR, Abel is involved in a research project on the mapping of

ecosystem services and benefit flows. The project, which will be mentored by CSIR earth observation research leader, Dr Jan van Aardt, focuses on building CSIR scientific capacity in this regard. Other objectives include identifying stakeholders and beneficiaries of ecosystem services and benefit flows, and developing a leading international profile through scientific outputs, such as peer-reviewed papers, post-graduate theses, as well as conference proceedings. On a scientific level, the project is focused on providing information targeted at demonstrating the links between human well-being and ecosystem integrity, making useful inputs into the policy debate around ecosystem management, and developing questions and studies that will lead to case studies for mainstreaming biodiversity at policy level.

Abel says the South African fields of GIS and EO need a hands-on approach to match European standards. "The infrastructure for practical assignments blew me away over there," he says. "I'm eternally indebted, not only to the CSIR, but to the country at large, for offering me this great opportunity. I now have the responsibility of imparting some of those lessons learned with the rest of the local scientific community."

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He stresses the need to build networks. "We can't develop in isolation," he says. "To harness the European expertise, we need to work closely with them." Abel is optimistic about South Africa's research prospects. "In some aspects, such as mentoring and lecture hall teaching, I think South Africa comes out tops," he says. He regards his former research manager, Humbulani Mudau, and his mother as the people who've inspired him most. "Considering my background, where resources were not always readily available, I've also had to do much self-motivation." The thought of doing his PhD soon motivates him. "I need to settle down, having just arrived from Europe, then I'll be set for this next challenge," he says. "The opportunity will soon present itself and I'm ready to grab it." You bet!

- Tlhogi Mokhema