

The West African Exploration Initiative (WAXI): 12 years of integrated research for development

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The eleven-year AMIRA International Project P934 'West African Exploration Initiative' (WAXI), now in its third phase, has the dual aims of scientific research focused on increasing our understanding of the tectonic and regolith settings of ore deposits, and the development of the research and training capacity of West African geological surveys and universities. We describe the drivers for the WAXI initiative, as well as key research and capacity building outcomes. The WAXI project is a public-private partnership that has brought together seventy of the principal stakeholders in the domain of minerals exploration in West Africa:

- The government surveys and departments of mines of eleven West African states (Burkina Faso, Ghana, Guinea, Ivory Coast, Liberia, Mali, Mauritania, Niger, Sierra Leone, Senegal and Togo)
- Seven West and South African universities (from Burkina Faso, Côte d'Ivoire, Ghana, Mali, Senegal and South Africa)
- Thirty-four international mining companies
- Researchers from twelve European and Australian research institutions
- AMIRA International, an independent association of minerals companies that develops, brokers and facilitates collaborative research projects
- NGOs based in Burkina Faso, Ghana and Luxembourg
- A professional training centre based in Burkina Faso.
- National research and aid agencies in South Africa, France and Australia

The shared challenges facing geoscientists wishing to undertake scientific research in West Africa (from industry, governments and academia) include the limited flow of scarce government resources to STEM activities in general, and geoscience research in particular. In 2014, the Science, Technology, Engineering, and Mathematics (STEM) sector made up only 29% of all research in Sub-Saharan Africa (excluding South Africa, [World Bank and Elsevier, 2014](#)). National research priorities across Africa do include a range of activities related to geoscience research, in particular Energy, Natural Resource Management and Information and Communications Technology. Nevertheless the low proportions of the Gross Domestic Product (GDP) spent on research in West Africa (often less than 1%) coupled with the overall low levels of GDP, mean that even as priority areas the available budgets are small, and funds available for basic research are limited. This contrasts with the significant revenue flow that many West African countries receive as the result of mining activity, and the costs of managing the environmental impacts of mining (and in particular by variably regulated artisanal mining).

The WAXI project has a series of overlapping research goals, and is globally aimed at improving our understanding of the tectonics, metallogenesis and landform evolution of the West African Craton. In parallel the project aims to support the development of geoscience capabilities in the short, medium and long term. Immediate support for company staff improves their capacity to undertake exploration in the region; training geological survey staff improves their ability to provide geoscience data to end users, and scholarships and access to equipment for graduate students prepares them for work in all sectors of minerals geoscience, and trains the next generation of university lecturers.

This initiative demonstrates the significant research and development achievements that can be made when the different stakeholders in the minerals sector (industry, academia, government and non-government organisations) work together to achieve their diverse goals.

The WAXI project in numbers:

- 12 countries
- 73 partners over 11 years
- 97 Postdoc, PhD, Masters and Honours personnel, 60% of them African

- 85 International Publications
- 650 GB exploration geoscience database
- 1800 person-days of technical training in West Africa
- 650,000 km² of geophysically constrained geological mapping

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