

## Editorial

# Exploration and Environmental Exploitation (1908 – 2008)

As we celebrate *Janus* at the beginning of a new year at *African Journal of Environmental Science and Technology* (AJEST), it is important to reflect on the past, and their lessons for the future. The pace of activities suggests, in this case, the past 100 years. Most of the African landscape can still be described as “pristine” having escaped, so far, large scale industrial and agricultural projects that tend to permanently disfigure nature in other parts of the world. However, the mirage of pristine status has and continues to invite many adventure seekers to Africa, and in the interest of sustainable development, we must pay attention to the environmental consequences of contemporary exploration by visitors and indigenes alike. Today, explorers come as “tourists” and there is a well developed research literature on the cost-benefit analysis of tourism.

One hundred years ago, in February 1908, A. Robert Hottot (1884-1939) a French explorer, embarked on the “Mission Hottot” (also known as 'Mission ethnographique du Kanem-Chari-Logone) from his base in Antwerp in the Netherlands to the heart of Africa. The journey lasted a little over one year, and it is reasonably well-documented<sup>1</sup>. Hottot's interest in African travel had gradually evolved from *touriste* status to a *mission gratuite*, which allowed him to remove “objects” from the local environment for deposition in European vaults. Many explorers have since followed Hottot's footsteps, directly and figuratively, each selecting items for “discovery” and “recovery” and leaving a trail of environmental impacts.

Fast forward to 2008 – the biggest issues surrounding exploration and environmental exploitation today, is of course mining for resources, be it petroleum, diamonds, gold, or other precious metals and minerals. Africa is a very likely a net supplier of resources to other parts of the world. If environmental damage is included in the assessment of resource imbalance, the price of exploration will continue for generations to come. Somewhat ironically, according to the United States Geological Survey (USGS), there are more than 1,500 active mines in three major clusters in Africa<sup>2</sup> (Figure 1). Most of the mines also provide essential employment, and as such, they are near regions of heavy settlement and high population densities<sup>3</sup>. Thus, any environmental and ecological consequences associated with mining also have the potential to have lasting impacts on human health<sup>4</sup>.

One need not search too far or too deeply to find evidence of health impacts of exploration and mining in Africa. The lead mining and processing facility in Kabwe, Zambia was recently recognized as one of the ten worst polluted sites in the world. As far back as 1902, exploitable deposits of zinc and lead were discovered in the copper belt of Zambia, and the Kabwe mine operated for nearly a century, leaving a legacy of extreme environmental pollution in its wake<sup>5, 6</sup>.

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<sup>1</sup> Philip N. Grover and Christopher Morton, 'Hottot Collection', *Congo Journey: Photographs and Documents from Robert Hottot's Expedition to Central Africa, 1908-9* [website], (published online 12 January 2006) <<http://www.prm.ox.ac.uk/congojourney/robert-hottot-expedition-mission-collection-resources-bibliography.htm>>.

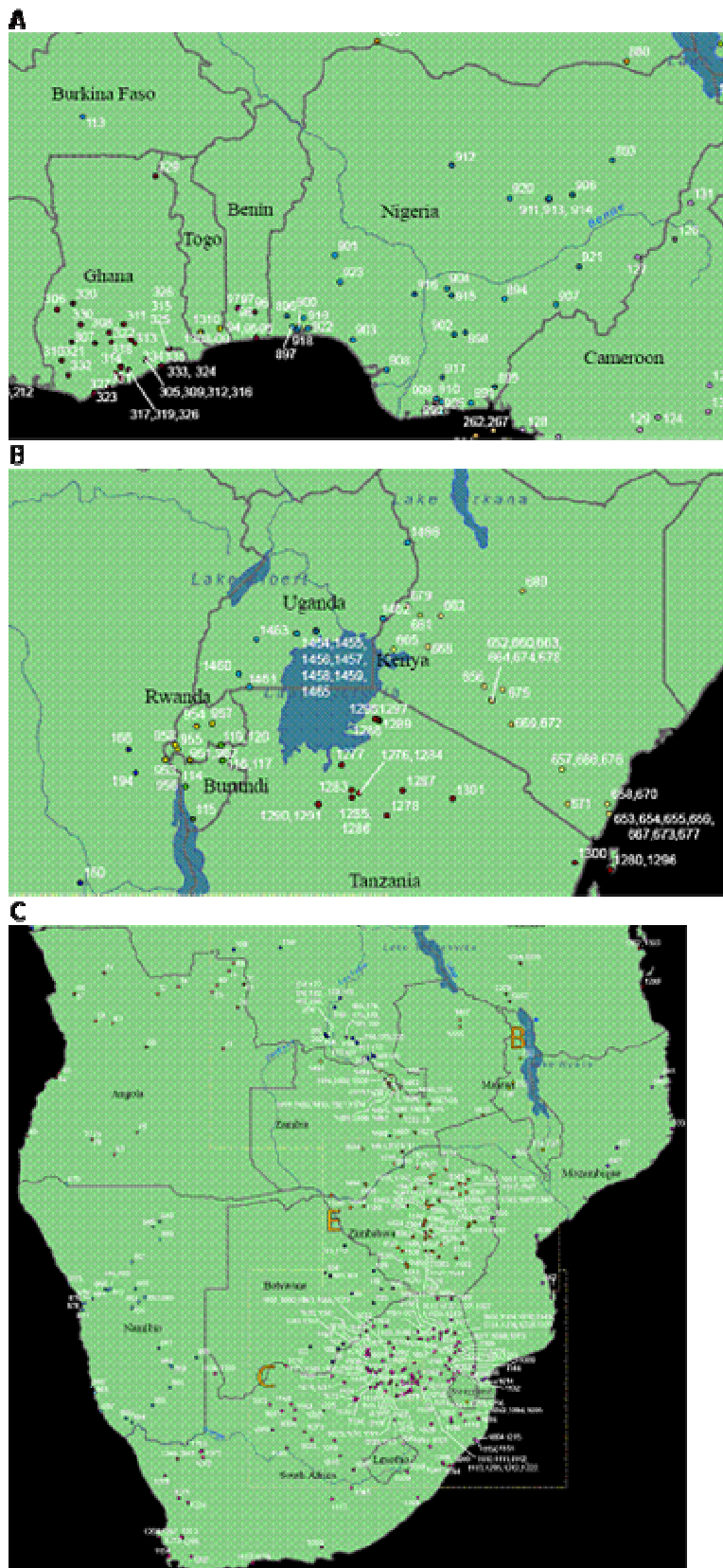
<sup>2</sup> Thomas R. Yager, Omayra Bermúdez-Lugo, Philip M. Mobbs, Harold R. Newman, and David R. Wilburn. 2005. The Mineral Industries of Africa. United States Geological Survey. <http://minerals.usgs.gov/minerals/pubs/country/2005/myb3-sum-2005-africa.pdf>.

<sup>3</sup> Mining and Sustainable Development and Job Creation: A Challenge for the African Century - <http://www.queensu.ca/samp/migdocs/Documents/2000/NUM.htm>

<sup>4</sup> Mining and Environmental Health in Africa. [http://www.frameweb.org/ev.php?ID=6872\\_201&ID2=DO\\_TOPIC](http://www.frameweb.org/ev.php?ID=6872_201&ID2=DO_TOPIC)

<sup>5</sup> “The Silent Death: Lead Poisoning in Kabwe, Zambia” Blacksmith Institute. 2001. <http://www.blacksmithinstitute.org/kabwe.shtml>

<sup>6</sup> B. D. Tembo, K Sichilongo, J. Cernak. 2006. Distribution of copper, lead, cadmium, and zinc concentrations in soils around Kabwe town in Zambia. *Chemosphere*, 63:497-501.



**Figure 1.** There are more than 1,000 mining and exploration sites in Africa, clustered in three main zones in Western, Eastern, and Southern Africa<sup>7</sup>.

<sup>7</sup> Charts by courtesy of United States Geological Survey – J.M. Eros and Luisette Candelario-Quintana. <http://pubs.usgs.gov/of/2006/1135/2006-1135.ai>.

Reportedly, the concentration of lead in some Kabwe children is ten times higher than the action level of 10 ug/dL. It will take millions of dollars to remediate the site, but the costs to human health and welfare is unfathomable.

Still explorations continue, with a dominant search for gold and other “precious” metals, all destined to produce considerable amount of toxic waste and landscape degradation, if the responsible corporations do not consciously adopt environmentally sustainable practices (Table 1). Even with appropriate technology, mining has a way of affecting local social ecology in unpredictable ways, as loosely documented in the 2006 movie “Blood Diamond” directed by Edward Zwick, and starring Djimon Hounsou and Leonardo DiCaprio. Similarly, the explosion of the electronic industry has intensified the demand for rare tantalum mined from coltan ore deposits in the Congo, fueling both civil and ecological conflicts. This is the time to integrate our knowledge base in environmental science, social science, and technological innovation to ensure that explorations do not necessarily lead to unsustainable exploitation of natural and social capital. We have what it takes to achieve this, at least until January 2108, when we will take stock again – on the pages of this journal.

**Table 1.** Selected exploration sites in Africa during 2005<sup>8</sup>

<b>COUNTRY</b>	<b>COMMODITY</b>	<b>COMPANY</b>
Botswana	Copper, Diamond	African Copper, plc. African Diamonds, plc.
Burkina Faso	Gold	Goldbelt Resources, Ltd. Orezon, Resources, Ltd.
Egypt	Gold	Centamin Egypt, Ltd.
Eritrea	Copper, Gold, Silver, Zinc	Sunridge Gold, Corp. Nevsun Resources, Ltd.
Ghana	Gold	Newmont Mining Corp.
Guinea	Gold	Cassidy Gold Corp.
Senegal	Gold	Mineral Deposits Ltd.
South Africa	Gold, Platinum Group Metals	AfriOre Ltd. Anooraq Resources, Corp. African Platinum, plc. Platinum Group Metals, ltd.
Tanzania	Gold	Barrick Gold Corp.
Zambia	Cobalt, Copper, Gold, Nickel, Platinum Group Metals	Albidon, Ltd.

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<sup>8</sup> Thomas R. Yager, Omayra Bermúdez-Lugo, Philip M. Mobbs, Harold R. Newman, and David R. Wilburn. 2005. The Mineral Industries of Africa. United States Geological Survey. <http://minerals.usgs.gov/minerals/pubs/country/2005/myb3-sum-2005-africa.pdf>.