



DATE: 4 DECEMBER 2025

# Resources in Africa

# CONTENT

<b>PROGRAMME</b> .....	6
------------------------	---

## **ABSTRACTS KEYNOTE SPEAKER AND PANELS**

Keynote   Minehood: Placing the Witwatersrand between settlement and systems. ....	14
■ Hannah le Roux	
Panel   Resources under stress: Researching land and belonging in the African Great Lakes region .....	15
Panel   UNU-CRIS Panel - Cross-border resource management and regional cooperation .....	18

## **ABSTRACTS INDIVIDUAL PRESENTATIONS**

Evaluating the impact of integrated soil fertility management under deficit irrigation on subsurface flow dynamics ...	23
■ Abdu Yimer Yimam, Desale Kidane, Seifu A. Tilahun, Margaret Chen, Abebech Abera, Mekete Dessie, Kristine Walraevens, Enyew Adgo Tsegaye, Amaury Frankl, Wim Cornelis	
Capacité des produits cartographiques mondiaux à caractériser les écosystèmes arides du Bénin : Hétérogénéité écologique et performances des cartes globales. ....	25
■ Agassounon Mahougnon Bill, Assede Emeline S. P., Bastin Jean-François, Biaou S. S. Honoré	
Mechanism of monodominance of <i>Gilbertiodendron dewevrei</i> , a hyperdominant tree species in the Congo Basin .....	27
■ Alain Kadorho, Blanca Van Houtte, John Tshibamba, Seintsheng Ntamwira, Jean-Pierre Messina, Jan Van den Bulcke, Wannes Hubau	
Causes and processes of land degradation in the rural Eastern Cape of South Africa: Views and experiences from indigenous communities .....	29
■ Chenai Murata, Gladman Thondhlana	
Croissance urbaine planifiée et non planifiée : cartographie des frontières invisibles dans la ville en plein essor de Kasumbalesa .....	30
■ Christian Koba Fazili	
South Africa–Namibia green hydrogen corridor: Skills development .....	31
■ Craig McGregor, Paul Thiele, Cristina Trois, Lorenzo Squintani	
African resources in the reconstruction of Europe after the Second World War .....	32
■ Danelle van Zyl-Hermann	
(Im)materiality and polymorphous resources: The carceral life of things at the Makala Central Prison. ....	33
■ Denis Augustin Samnick	
Bantu Languages amid natural resource preservation strategies and ecosystem protection in Tanzania .....	34
■ Dietram Efrem Mgeni (author), Alphonse Jamal Sadiki (co-author)	
Knowledge networks and ceramic traditions in the Congo Basin: Indigenous technological decisions as historical resources. ....	35
■ Dirk Seidensticker	
(Rural) Resources and communities: Historical pathways of the cement industry in Katana and Kabimba, Eastern Democratic Republic of Congo .....	36
■ Divin-Luc Bikubanya	



What's in a crop? A contextual investigation of vulnerability and resilience within the organic (pyrethrum) industry in Tanzania .....	37
■ Edwin Otieno Ondiege	
Cattle and landscapes: Environmental legacies of the cattle industry in twentieth-century Katanga, Democratic Republic of the Congo .....	38
■ Elene Vernaeeve	
Assessing floristic diversity and carbon stock recovery along secondary succession in the Congo Basin forests .....	39
■ Eli Mutwedu Mwishingo, Nils Bourland, Isaac Ahanamungu Makelele, Déborah Waluvera Kahindo, Jean-Pierre Mate Mweru, Jean-Remis Makana, Wannes Hubau	
Traditional plant knowledge as a reservoir of resilience to address climate change challenges in Karamoja, Northeast Uganda .....	41
■ Emiel De Meyer	
Security governance in cobalt mining in Haut-Katanga and Lualaba, DRC: Actors, tensions, and resistance .....	42
■ Espérant Mwishamali Lukobo	
From the BantUGent Corpus to Kirundi on Google Translate: Mutualization made real .....	43
■ Ferdinand Mberamihigo	
Building on the back of nature: Assessing the environmental cost of aggregate mining in eastern DR Congo .....	44
■ Franck Mugisho Zahinda, Bossissi Nkuba, Sara Geenen, Lieven Bervoets	
Risk attitudes and preferences for solar-powered irrigation among rice farmers in northern Nigeria .....	45
■ Funminiyi Peter Oyawole, Mensah-Bonsu, A., Jatoe, J.D., Adaku, A.A., Cerjak, M.	
Entrepreneuriat foncier et urbanisation rapide à Lubumbashi : Étude de cas des quartiers Kyaluwaya et Maisha .....	46
■ Guy Masudi Mwana Mulenda, Oswald Devisch, Liesbeth Huybrechts, Regina John, César Khonde, Bonaventure Banza wa Banza	
Aligning extractive industries with the SDGs: Evaluating environmental protection practices of mining companies in Tanzania .....	47
■ Hanifa T. Massawe	
Whose language? Whose justice? Colonial legacies in Africa .....	48
■ Happyness Nokwatu Raselabe	
Diverse causes of extreme rainfall in November 2023 over equatorial Africa .....	49
■ Hermann N. Nana, Masilin Gudoshava, Roméo S. Tanessong, Alain T. Tamoffo, Derbetini A. Vondou	
Ethnobotanical survey of medicinal plants used by communities on the fringes of Budongo Central Forest Reserve, Uganda .....	50
■ Ivan Kahwa, Timothy Omara , Mercy Agaba , Upton Nuwagira, Clement O. Ajayi	
On <i>Jerabos</i> and <i>Kpo-Fire</i> : Extraction, infrastructural violence, and tistance on the Zambian Copperbelt and the Niger Delta .....	51
■ Jackson Tamunosaki Jack, Jabulani Shaba , Iva Peša	
The Diamond Floors of Rooifontein: Towards an environmental history of a post-industrial diamond mining site in Kimberley, South Africa .....	52
■ Jan-Bart Gewald	
Quantifying carbon emissions and their impact on mitigation intervention implementation in identified healthcare facilities hotspots: Case studies from Kenya, Zimbabwe, and South Africa .....	53
■ Jetina Tsvaki, Thabani Muronzie, Josh Rusike, Tapiwa Nyakabau, Fortunate Machingura, Jean Le Roux, Celeste Madondo, Shobna Sawry, Aquinius Mung'atia, Sohail Ally Baloch, Zeenat Sulaiman, Stanley Luchters	

Le séquençage armé à l'est du Congo : Scruter les acteurs armés dans les chaînes d'approvisionnement des ressources naturelles .....	55
■ Josaphat Musamba	
Mapping the construction minerals supply chains: Actors, power, and governance .....	56
■ Joseph Bahati Mukulu	
The Expropriation Without Compensation Act: Exposing the need for a paradigm shift .....	57
■ Josephine Vaccaro	
Environmental Impact Assessment (EIAs) and socio-ecological safeguards: A critical review of EIAs in Uganda's Albertine oil exploration zone .....	58
■ Juliet Musoke Nakabuye, Bosco Bwambale, Hendrik Schoukens	
Diamond rush: Securitization and de-militarization debate of the diamond fields in Chiadzwa Community, Zimbabwe ..	59
■ Knowledge Mwonzora	
Blood minerals and broken states: The politicisation of resource extraction in Africa's conflict zones .....	60
■ Lukong Stella Shulika, Ansem Wongibeh Adunimay	
AfCFTA's role in promoting sustainable intra-African timber trade for inclusive green growth .....	61
■ Lydia Afriyie-Kraft, Marie Louise Avana, Folaranmi Babalola, Thomas Breu, Daphine Gitonga, Moussa Massaoudou, Doris Mutta, Labode Popoola, Astrid Zabel	
The United Nations Development Programme's finance strategy for Greater Kruger of South Africa: Green extractivism disguised? .....	62
■ Magdalena Sophie Fröhlich, Chenai Murata	
Rethinking tales of the land and sea: Ecological epistemologies in Digo oral narratives, Kenya .....	63
■ Mark Obure-Morang'a, Peter Wasamba	
Oil discovery in Namibia and public governance arrangements: Can Namibia avoid the resource curse? .....	64
■ Mazarire Tichaona, Phago Kedibone Phago	
The development and validation of a PhD competency framework in Ethiopia: A modified Delphi study .....	65
■ Mieke Embo, Hanna Getachew Amare, Bekalu Ferede, Tibebu Alemu, Kasahun Eba, Taye Gebremariam, Bersissa Kumsa, Fiona Van de Velde, Teklu Gemechu Abessa, Bruno Leveck	
Rethinking women's marginalization through ICBT in the Uganda-Congo borderland regions .....	67
■ Naomi Nabami	
Community lands under siege: The rise of Egodina Osha youth land grabbers in Asaba and her neighbouring communities in Nigeria .....	68
■ Olisa Daniel Iweze	
Theorizing African agency in the political economy of global energy transition .....	69
■ Olusola Ogunnubi	
Land, livelihoods, and the limits of reform: The RUGA controversy in Nigeria .....	70
■ Olutomiwa Binuyo, Igbagbodayo Ogunkeye	
Nigeria's oral and cultural heritage in social cohesion and sustainable development .....	71
■ Oluwatosin Omobolanle Ogwezy	
Zircon and ilmenite extraction in Northern Senegal: Sand minerals that escalate ecocide .....	72
■ Papa Sow	
Is there a place for plant-based South African products on the world market? Lessons from practice .....	73
■ Patrick Van Damme	



“Plunder for profit?” Zimbabwe’s look east policy, Chinese firms, natural resources, and the environment since 2000...	74
Peter Uledi	
The making and unmaking of the Cattle Frontier in Madagascar, 1870s–1970s	75
Samuël Coghe	
How “responsible sourcing” enables green extractivism: Strategic (in)visibility in the cobalt sector in the Democratic Republic of Congo (DRC)	76
Sarah Katz-Lavigne, Sara Geenen, Hadassah Arian	
Contrasting patterns of denitrification product ratios ( $N_2O/(N_2O+N_2)$ ) in the Congo Basin	77
Serge Alebadwa, Marijn Bauters, Roxanne Daelman, Matti Barthel, Georg Willibald, Thomas Sibret, Dries Landuyt, Pascal Boeckx, Ralf Kiese	
Does scale matter? Comparative analysis of land-use/cover changes in industrial, artisanal and small-scale mining landscapes in the Democratic Republic of Congo	79
Serge Mugisho Mukotanyi, Christiane Migabo, Sara Geenen, Caroline Michellier, Bossissi Nkuba	
When governing sustainability transformations turn regressive: Contestations over seed legislation in Ghana	80
Siera Vercillo, Logan Cochrane	
Encadrer l’exploitation des ressources naturelles en contexte colonial : l’usage réglementé de la faune en Afrique équatoriale française (1910-1960)	81
Simplice Ayangma Bonoho	
‘We did not know it was abuse’: Empowering women with disabilities against gender-based violence	82
Sisa Ngabaza	
Depth of trade integration and trade margins of environmental goods in Africa	83
Socrates Kraido Majune, Christopher Lchukeyan Segelan, Owen Nyangoro, Davis Ombane, Angella Faith Montfaucon, Patricia Ssozi Naluwooza	
How reliable are satellite rainfall estimates in complex terrain? A case study from the Ethiopian Highlands	84
Solomon Sebesbew Ewnetu, Mekete Dessie, Mulugeta A. Belete, Ann van Griensven, Kristine Walraevens, Amaury Frankl, Enyew Adgo, Niko E. C. Verhoest	
The taxation of artisanal mining in conflict-affected contexts: from armed predation to ‘informal formalisation’	85
Steven Van Bockstael, Jeroen Cuvelier, Koen Vlassenroot, Josaphat Musamba Bussy	
De la course aux matières premières aux déplacements massifs des populations : comprendre la polycrise à l’Est de la RD Congo	86
Sylvie Imata Bulaya, Gabriel Kamundala	
Africa at the nexus of green colonialism: Geopolitics and governance of critical raw materials in the DRC and Namibia	87
Takudzwa Mharadze	
Extensive pig husbandry as a novel approach to primate conservation and sustainable use of African rainforest	88
Teresa Costa, Eduardo de la Peña, Pablo Manzano	
The political economy of wildlife	89
Théodore Trefon, Krossy Mavakala	
Community wellbeing and ghost biofuels projects: Abandoned Jatropha Curcas large-scale land deal plantations in East Africa	90
Wilson Omalenge Ndenyele	
Contested resources, politics and war	91
Zanele Vilakazi, Ntlantla Valtein	
Whose land is it anyway? – An evolutionary economics approach to land, institutions, and capital accumulation in Ethiopia, Ghana, and Tanzania	92
Zenebe Uraguchi	

# PROGRAMME



## THURSDAY 4 DECEMBER 2025

**8h00-9h00** Registration and coffee [Zaal Vos]

**9h00-9h30** Opening and words of welcome by the presidents of the Africa Platform [Zaal De Blauwe Vogel]

**9h30-11h00** Individual Oral Presentations – Session One

	<b>Session 1A</b> Chair: Stijn Dewaele [Zaal De Blauwe Vogel]	<b>Session 1B</b> Chair: Joost Dessein [Zaal Haas]	<b>Session 1C</b> <b>UNU-CRIS panel – Cross-border resource management and regional cooperation</b> Chairs: Frank Mattheis & Ine Lietaert [Zaal De Twistappel]	<b>Session 1D</b> Chair: Koen Bostoen [Zaal De Laatkamer]
<b>9h30</b>	<b>Jan-Bart Gewald</b> (African Studies Centre, Leiden University, The Netherlands)  The Diamond Floors of Rooifontein: Towards an environmental history of a post-industrial diamond mining site in Kimberley, South Africa	<b>Eli Mutwedu Mwishingo et.al.</b> (Ecole Régionale Post-Universitaire d'Aménagement et de gestion Intégrés des Forêts et territoires Tropicaux, DR Congo; Université Officielle de Bukavu, DR Congo; Université Catholique de Bukavu, DR Congo & Institut National pour l'Etude et la Recherche Agronomiques (INERA/Yangambi), DR Congo)  Assessing floristic diversity and carbon stock recovery along secondary succession in the Congo Basin forests  online	<b>Frank Mattheis</b> (UNU-CRIS & Ugent, Belgium) & <b>Ueli Staeger</b> (University of Amsterdam/UNU-CRIS, The Netherlands/Belgium)  Defending regional resources and norms: African regional organizations' sanctions against non-paying members	<b>Oluwatosin Omobolanle Ogwezy</b> (University of Port Harcourt, Nigeria)  Nigeria's oral and cultural heritage in social cohesion and sustainable development  online
<b>9h45</b>	<b>Divin-Luc Bikubanya</b> (Institute of Development Policy, University of Antwerp, Belgium)  (Rural) Resources and communities: Historical pathways of the cement industry in Katana and Kabimba, Eastern Democratic Republic of Congo	<b>Patrick Van Damme</b> (Czech University of Life Sciences Prague, Czech Republic & Ghent University, Belgium)  Is there a place for plant-based, South African products on the world market? Lessons from practice	<b>Nidhi Naglabatha et.al.</b> (UNU-CRIS & Ugent, Belgium), <b>Mahmoud Radwan</b> (University of Waterloo, Canada) & <b>Padmi Ranasinghe</b> (McMaster University, Canada)  Participatory negotiation support framework towards enhancing transboundary water security in the Congo Basin Region	<b>Denis Augustin Samnick</b> (Institute of Development Policy, University of Antwerp, Belgium)  (Im)materiality and polymorphous resources: The carceral life of things at the Makala Central Prison
<b>10h00</b>	<b>Danelle van Zyl-Hermann</b> (University of Basel, Switzerland)  African resources in the reconstruction of Europe after the Second World War  online	<b>Emiel De Meyer</b> (Staatliches Museum für Naturkunde Karlsruhe, Germany & Ghent University, Belgium)  Traditional plant knowledge as a reservoir of resilience to address climate change challenges in Karamoja, northeast Uganda	<b>Dereje Tesema Regasa</b> (Jimma University, Ethiopia & UNU-CRIS, Belgium)  From neighbours to rivals: Revisiting the politics of protective territoriality across Oromia-Somali regional states in Ethiopia  online	<b>Mark Obure-Morang'a et.al.</b> (Ghent University, Belgium & University of Nairobi, Kenya)  Rethinking tales of the land and sea: Ecological epistemologies in Digo oral narratives, Kenya  online

10h15	<b>Jackson Tamunosaki Jack et.al.</b> (University of Groningen, The Netherlands) <i>On Jerabos and Kpo-Fire: Extraction, infrastructural violence, and resistance on the Zambian Copperbelt and the Niger Delta</i>	<b>Edwin Otieno Ondiege</b> (Ghent University, Belgium) <i>What's in a crop? A contextual investigation of vulnerability and resilience within the organic (pyrethrum) industry in Tanzania</i> online	<b>Jamie Pring</b> (Universität Basel, Switzerland & UNU-CRIS, Belgium) <i>Restructuring the African peace and security architecture: Streamlining resources or limiting responsiveness?</i> online	<b>Dietram Efrem Mgeni et.al.</b> (University of Dar es Salaam, Tanzania) <i>Bantu languages amid natural resources preservation strategies and ecosystem protection in Tanzania</i> online
10h30	<b>Hanifa T. Massawe</b> (Mzumbe University, Tanzania & Advocate of the High Court of Tanzania and Subordinate Courts thereto) <i>Aligning extractive industries with the SDGs: Evaluating environmental protection practices of mining companies in Tanzania</i> online	<b>Ivan Kahwa et.al.</b> (Mbarara University of Science and Technology, Uganda) <i>Ethnobotanical survey of medicinal plants used by communities on the fringes of Budongo Central Forest Reserve, Uganda</i> online	<b>Amalie Ravn Weinrich</b> (University of Copenhagen, Denmark) <i>Regional citizenship and mobility as political resources: Implications of the current fragmentation of ECOWAS' free movement regime</i>	<b>Happyess Nokwatu Raselabe</b> (University of the Western Cape, South Africa) <i>Whose language? Whose justice? Colonial legacies in Africa</i> online
10h45	<b>Sarah Katz-Lavigne et.al.</b> (Institute of Development Policy, University of Antwerp, Belgium & Centre d'Expertise en Gestion Minière, Université Catholique de Bukavu, DR Congo) <i>How "responsible sourcing" enables green extractivism: Strategic (in)visibility in the cobalt sector in the Democratic Republic of Congo (DRC)</i>	<b>Siera Vercillo et.al.</b> (Wageningen University and Research, The Netherlands) <i>When governing sustainability transformations turn regressive: Contestations over seed legislation in Ghana</i>	<b>Chibuzor Charles Ubah et.al.</b> (Alliance of Bioversity International & UNU-CRIS, Belgium & Nidhi Nagabhatla (UNU-CRIS & Ugent, Belgium) <i>Bridging policy and practice: How far has the Regional Malabo Declaration taken Africa in the fight against hunger?</i>	<b>Ferdinand Mberamihigo</b> (Université du Burundi, Burundi; Centre de recherche en Langues, Cultures et Sociétés (CRELACS), Burundi & Ghent University, Belgium) <i>From BantUgent Corpus to Kirundi on Google Translate: Mutualization made real</i> online

**11h00-11h30** Coffee break [Zaal Vos]

**11h30-12h30** Keynote lecture by Hannah le Roux (University of Sheffield): Minehood: Placing the Witwatersrand between settlement and systems [Zaal De Blauwe Vogel]

**12h30-14h00** Lunch break [Krook café – ground floor]

**13h00-14h00** Africa Forum – General Assembly of the Africa Platform (for AUGent staff) [Zaal Haas]

**14h00-15h30** Individual Oral Presentations – Session Two



<b>Session 2A</b> Chair: Stijn Dewaele [Zaal De Blauwe Vogel]		<b>Session 2B</b> Chair: Piet Cools [Zaal Haas]	<b>Session 2C</b> Chair: Ine Liettaert [Zaal De Twistappel]	<b>Session 2D</b> Chair: Koen Bostoen [Zaal De Laatkoker]	<b>Session 2E</b> <b>Panel: Resources under Stress: Researching Land and Belonging in the African Great Lakes Region</b> Chair: An Ansoms [Zaal Vergeten Straat]
<b>14h00</b>	<b>Samuël Coghe</b> (Ghent University, Belgium) The making and unmaking of the Cattle Frontier in Madagascar, 1870s-1970s	<b>Solomon Sebesbew Ewnetu et al.</b> (Ghent University, Belgium & Bahir Dar University, Ethiopia) How reliable are satellite rainfall estimates in complex terrain? A case study from the Ethiopian Highlands	<b>Lydia Atrivie-Kraft et al.</b> (University of Bern, Switzerland) AfCFTA's role in promoting sustainable intra-African timber trade for inclusive green growth	<b>Dirk Seidensticker</b> (Goethe University Frankfurt, Germany) Knowledge networks and ceramic traditions in the Congo Basin: Indigenous technological decisions as historical resources	<b>Patient M. Polepole</b> (Université Catholique de Louvain, Belgique) Sécurisation foncière décentralisée : Genre, autorité publique et luttes dans l'arène coutumière au Sud-Kivu (RDC)
<b>14h15</b>	<b>Elene Vernaeve</b> (Ghent University, Belgium) Cattle and landscapes: Environmental legacies of the cattle industry in twentieth century Katanga, Democratic Republic of the Congo	<b>Abdu Yimer Yimam et al.</b> (Ghent University, Belgium & Bahir Dar University, Ethiopia) Evaluating the impact of integrated soil fertility management under deficit irrigation on subsurface flow dynamics	<b>Socrates Kraido Majune et al.</b> (University of Nairobi, Kenya) Depth of trade integration and trade margins of environmental goods in Africa online	<b>Chenai Murata et al.</b> (University of Vienna, Austria) Causes and processes of land degradation in the rural Eastern Cape of South Africa: Views and experiences from indigenous communities	<b>Vedaste Cifuli</b> (Université Catholique de Louvain, Belgique) Creating protected areas during armed conflict: Inter-communal power relations and conflict in the Hauts Plateaux of Fizi in South Kivu, DR Congo
<b>14h30</b>	<b>Espérant Mwishamali Lukobo</b> (Ghent University, Belgium) Security governance in cobalt mining in Haut-Katanga and Lualaba, DRC: Actors, tensions, and resistance	<b>Hermann N. Nana et al.</b> (University of Yaounde 1, Cameroon) Diverse causes of extreme rainfall in November 2023 over equatorial Africa online	<b>Magdalena Sophie Fröhlich et al.</b> (University of Vienna, Austria) The United Nations Development Programme's finance strategy for Greater Kruger of South Africa: Green extractivism Disguised?	<b>Mazarire Tichaona et al.</b> (North-West University, South Africa) Oil discovery in Namibia and public governance arrangements: Can Namibia avoid the resource curse? online	<b>Yanaelle Ntwa-nese-Akensone Bompa</b> (Université Catholique de Louvain, Belgique) Rooted resilience: Agroecological pathways in Central Africa amid climate crisis
<b>14h45</b>	<b>Papa Sow</b> (Nordic Africa Institute, Sweden) Zircon and ilmenite extraction in northern Senegal: Sand minerals that escalate ecocide online	<b>Agassounon Mahougnon Bill et al.</b> (Université de Liège, Belgique & Université de Parakou, Bénin) Capacité des produits cartographiques mondiaux à caractériser les écosystèmes arides du Bénin : Hétérogénéité écologique et performances des cartes globales	<b>Mieke Embo et al.</b> (Ghent University, Belgium & Artevelde University of Applied Sciences, Belgium) The development and validation of a PhD competency framework in Ethiopia: a modified Delphi study	<b>Théodore Trefon et al.</b> (Africa Museum, Belgium & Ecole Régionale Postuniversitaire d'Aménagement et de Gestion intégrés des Forêts et Territoires tropicaux (ERAIFT), DR Congo) The political economy of wildlife	<b>Mbuluku Faïda Andreita</b> (Université Catholique de Louvain, Belgique) Between adaptation and hegemony: Dynamics and controversies around climate-smart agriculture in Tshopo, Kwilu and Kongo Central

15h00	<b>Simplicie Ayangma Bonoho</b> (Université de Montréal, Canada) Encadrer l'exploitation des ressources naturelles en contexte colonial : l'usage réglementé de la faune en Afrique équatoriale française (1910-1960)	<b>Alain Kadorho et.al.</b> (Ghent University, Belgium; Université Officielle de Bukavu, RD Congo & Ecole Régionale d'Aménagement et de gestion Intégrées de Forêts et Territoires tropicaux, RD Congo) Mechanism of monodominance of <i>Gilbertiodendron dewevrei</i> , a hyperdominant tree species in the Congo Basin online	<b>Christian Koba Fazili</b> (Ghent University, Belgium) Croissance urbaine planifiée et non planifiée : cartographie des frontières invisibles dans la ville en plein essor de Kasumbalesa	<b>Naomi Nabami</b> (University of Antwerp, Belgium) Rethinking women's marginalization through ICBT in the Uganda-Congo borderland regions	<b>Midagu Kabumba Alain</b> (Université Catholique de Louvain, Belgique) Happily ever after? – Conservation, compensations et reconfigurations communautaires autour du Parc Virunga (RDC)
15h15	<b>Teresa Costa et.al.</b> (Ghent University, Belgium) Extensive pig husbandry as a novel approach to primate conservation and sustainable use of African rainforest	<b>Serge Alebadwa et.al.</b> (Karlsruhe Institute of Technology, Garmisch-Partenkirchen, Germany) Contrasting patterns of denitrification product ratios (N2O/(N2O+N2)) in the Congo Basin		<b>Sisa Ngabaza</b> (University of the Western Cape, South Africa) ‘We did not know it was abuse’: Empowering women with disabilities against gender-based violence online	

15h30-16h00 Coffee Break [Zaal Vos]  
16h00-17h30 Individual Oral Presentations - Session Three



	<b>Session 3A</b> Chair: Amaury Frankl [Zaal De Blauwe Vogel]	<b>Session 3B</b> Chair: Nick Rahier [Zaal Haas]	<b>Session 3C</b> Chair: Michel De Paepe [Zaal De Twistappel]	<b>Session 3D</b> Chair: Karen Büscher [Zaal De Laatkamer]
<b>16h00</b>	<b>Franck Mugisho Zahinda et.al</b> (University of Antwerp, Belgium & Université Catholique de Bukavu, DR Congo) Building on the back of nature: Assessing the environmental cost of aggregate mining in eastern DR Congo online	<b>Guy Masudi Mwana Mulenda et.al.</b> (University of Hasselt, Belgium & Université de Lubumbashi, DR Congo) Entrepreneuriat foncier et urbanisation rapide à Lubumbashi: études de cas des quartiers Kyaluwaya et Maisha online	<b>Olusola Ogunnubi</b> (Queen's University, Kingston, Canada) Theorizing African agency in the political economy of global energy transition	<b>Peter Uledi</b> (University of the Free State, South Africa) "Plunder for profit?" Zimbabwe's look east policy, Chinese firms, natural resources, and the environment since 2000 online
<b>16h15</b>	<b>Steven Van Bockstael et.al.</b> (University of Groningen, The Netherlands) The taxation of artisanal mining in conflict-affected contexts: from armed predation to 'informal formalisation'	<b>Olisa Daniel Iweze</b> (University of Benin, Nigeria) Community lands under siege: The rise of Egodina Osha youth land grabbers in Asaba and neighbouring communities in Nigeria online	<b>Craig McGregor et.al.</b> (University of Stellenbosch, South Africa) South Africa – Namibia green hydrogen corridor: Skills development online	<b>Joseph Bahati Mukulu</b> (Institute of Development Policy, University of Antwerp, Belgium & CEGEMI, Université Catholique de Bukavu, DR Congo) Mapping the construction minerals supply chains: actors, power and governance online
<b>16h30</b>	<b>Josaphat Musamba</b> (Ghent University, Belgium) Le séquençage armé à l'est du Congo : Scruter les acteurs armés dans les chaînes d'approvisionnement des ressources naturelles	<b>Serge Mugisho Mukotanyi et.al.</b> (Institute of Development Policy, University of Antwerp, Belgium; Université Catholique de Bukavu, DR Congo & Africa Museum, Belgium) Does scale matter? Comparative analysis of land-use/cover changes in industrial, artisanal and small-scale mining landscapes in the Democratic Republic of Congo	<b>Fuminiyi Peter Oyawole et.al.</b> (University of Ghana, Ghana & Federal University of Agriculture, Nigeria) Risk attitudes and preferences for solar powered irrigation among rice farmers in northern Nigeria online	<b>Takudzwa Mharadze</b> (Zimbabwe Open University, Zimbabwe & University of Johannesburg, South Africa) Africa at the nexus of green colonialism: Geopolitics and governance of critical raw materials in the DRC and Namibia online
<b>16h45</b>	<b>Knowledge Mwonzora</b> (Nelson Mandela University, South Africa) Diamond rush: Securitization and de-militarization debate of the diamond fields in Chidzwa Community in Zimbabwe online	<b>Olutomiwa Binuyo et.al.</b> (University of the Western Cape, South Africa) Land, livelihoods, and the limits of reform: The RUGA controversy in Nigeria online	<b>Wilson Omalenge Ndenyele</b> (Technical University of Mombasa, Kenya) Community wellbeing and ghost biofuels projects: Abandoned Jatropha Curcas large scale land deal plantations in East Africa online	<b>Josephine Vaccaro</b> (Universidad Complutense de Madrid, Spain) The Expropriation Without Compensation Act: Exposing the need for a paradigm shift
<b>17h00</b>	<b>Sylvie Imata Bulaya et.al.</b> (Université de Gand, Belgique & Institut Supérieur de Bukavu, RD Congo) De la course aux matières premières aux déplacements massifs des populations : comprendre la polycrise à l'Est de la RD Congo	<b>Zenebe Uraguchi</b> (Bern University of Applied Sciences, Switzerland) Whose land is it anyway? – An evolutionary economics approach to land, institutions, and capital accumulation in Ethiopia, Ghana, and Tanzania	<b>Jetina Tsvaki et.al.</b> (Centre for Sexual Health and HIV AIDS Research Zimbabwe (CeSHHAR), Zimbabwe & Aga Khan Health Services, Kenya) Quantifying carbon emissions and their impact on mitigating intervention implementation in identified healthcare facilities hotspots: Case studies from Kenya, Zimbabwe, and South Africa	<b>Juliet Musoke Nakabuye et.al.</b> (Ghent University, Gent, Belgium & Uganda Martyrs University, Uganda) Environmental Impact Assessment (EIAs) and socio-ecological safeguards: A critical review of EIAs in Uganda's Albertine oil exploration zone



17h15	<b>Lukong Stella Shulika et.al.</b> (IIE Varsity College, South Africa) Blood minerals and broken states: The politicisation of resource extraction in Africa's conflict zones online	<b>Zanele Vilakazi et.al.</b> (University of the Western Cape, South Africa) Contested resources, politics and war online	
-------	---	---	--

**19h30-21h30** Ghent University Nelson Mandela Lecture, with South African Ambassador to Belgium HE Tokozile Xasa, former Namibian Ambassador to Belgium Mekondjo Kaapanda-Girrus, impact investment professional and author Loïc De Cannière and Lieselot Declercq, entrepreneur and director of d-teach - moderated by Mo\* journalist John Vandaele and opened by UGent pro-vice-rector Mieke Van Herreweghe  
With guest performances by Tutu Puoane and Jolyn Phillips  
[Zaal De Blauwe Vogel]  
**21h30-23h00** Reception [Krook café – ground floor]

# ABSTRACTS KEYNOTE SPEAKER AND PANELS

# Keynote | Minehood: placing the Witwatersrand between settlement and systems

---

Hannah le Roux  
(University of Sheffield, UK)

South Africa's Witwatersrand, home to over ten million people, is also a *technical land*, a place of abundant measurement, logistics and extraction. Since its founding in the late 19th century by Western capitalists to extract gold from below lightly settled land, it has become a hyper-scaled version of what many resource regions in Africa might yet become: places of densely lived urbanity created through and despite the application of distant and abstract technical knowledge. Tracking this history over the last 140 years in mining, architecture and social archives, as well as in its deep inequalities and material mess today, we can see the problems that separating settlement and systems over time create.

Drawing on Boelen et al's (2022) articulation of *riverhoods* as potential commons that overlap similarly split ontologies, this talk suggests using *minehood* to describe the Witwatersrand towards an integrated future. A *minehood*—stressing the possessive second meaning of *mine*, so signalling belonging—would also enfold reparative imaginaries that some designers and activists have used to suggest its future. Such representations cross the boundaries of historical split knowledge systems. They hint at this alternative Witwatersrand as a common place in which overground settlements respond to underground strata and movement; where infrastructural servitudes coexist with wasteland reclamation; and in which urban developers address and repair their creation of sacrifice zones.

## Keywords

Witwatersrand, Resource cities, Mining archives, Post-extraction

## Panel | Resources under stress: Researching land and belonging in the African Great Lakes region

Coordination:

An Ansoms

(Université Catholique de Louvain, Belgique – [an.ansoms@uclouvain.be](mailto:an.ansoms@uclouvain.be))

In a context of an intensifying rush for natural resources combined with the challenges of climate change, two main discourses have come to dominate natural resource policy. On the one hand, there is the emphasis on facilitating the productive management of resources to provide development opportunities. On the other hand, there is the focus on protecting vulnerable ecosystems to safeguard global biodiversity and sustainability.

However, on the ground, conflict-generating inequalities persist or are worsening, disproportionately affecting specific marginalized social groups with considerable violence. For these populations, issues of access to natural resources—including water, forests, land, and subsoil—do not stem solely from land grabbing. They are deeply linked to structural and socio-historical conditions embedded within society, which have historically pushed them to the margins.

Addressing poverty among these groups therefore requires a closer examination of their specific situations, struggles, vulnerabilities, and forms of agency and resistance. The various papers in this panel explore these themes in depth.

### Keywords

Resources, Climate change, Inequality, Violence, Central Africa

### Sécurisation foncière décentralisée :

### Genre, autorité publique et luttes dans l'arène coutumière au Sud-Kivu (RDC)

Patient M. Polepole (Université Catholique de Louvain, Belgique – [patient.polepole@uclouvain.be](mailto:patient.polepole@uclouvain.be))

Au Sud-Kivu, la terre constitue une ressource vitale et source de conflits, au cœur des enjeux dans un contexte marqué par des crises récurrentes, des déplacements de population et des dynamiques foncières complexes. Face à l'insécurité foncière persistante, les acteurs cherchent à renforcer la reconnaissance des droits fonciers par la formalisation.

Cependant, les approches étatiques centralisées de délivrance de titres individuels peinent à résoudre les conflits locaux, tandis que la gouvernance coutumière, bien que décentralisée, n'apporte pas toujours de réponses légitimes et efficaces. Dans ce contexte, une « troisième voie » émerge sous la forme de dispositifs hybrides de sécurisation foncière, portés par des organisations non gouvernementales, des agences des Nations unies et des acteurs de la coopération. Ces initiatives sont expérimentées dans plusieurs chefferies de la province.

Toutefois, elles génèrent de nouvelles tensions : elles redéfinissent les autorités locales, ravivent des conflits latents et suscitent des luttes de reconnaissance, en particulier parmi les groupes marginalisés, tels que les femmes et les jeunes. S'appuyant sur une recherche conduite entre 2019 et 2024 dans les territoires de Kabare, Kalehe et Uvira, cette contribution examine les effets de ces dispositifs sur les rapports de pouvoir, les dynamiques sociales et les formes de résistance dans l'arène foncière coutumière.



## **Creating protected areas during armed conflict: Inter-communal power relations and conflict in the Hauts Plateaux of Fizi in South Kivu, DR Congo**

Vedaste Cituli (Université Catholique de Louvain, Belgique – [Vedaste.cituli@uclouvain.be](mailto:Vedaste.cituli@uclouvain.be))

This article examines the politics of establishing protected areas in regions affected by armed conflict. While existing literature often highlights how conservation can serve as a tool of state counter-insurgency in so-called “violent environments”—used to control populations and territory—this study explores a different dynamic. We focus on cases where competing ethnic groups, themselves in conflict, mobilize the creation of protected areas as a means of advancing inter-ethnic struggles.

Our analysis centers on the Ngandja Wildlife Reserve in Fizi, South Kivu, in the eastern Democratic Republic of Congo. In this context, the establishment of the reserve has been shaped not only by environmental concerns but also by deeply rooted local tensions. International actors involved in its creation have, often unknowingly, become entangled in these conflicts, which are closely linked to powerful political and economic elites. Their top-down approach has overlooked the local motivations and political calculations driving the push for protection.

This article argues that the classification of community forests as protected areas can function as a strategy to displace marginalized communities and assert the authority of dominant local leaders. In this sense, conservation becomes a continuation of armed conflict by other means. The analysis draws on ethnographic fieldwork conducted in 2017 and from 2022 to 2023.

## **Rooted resilience: Agroecological pathways in Central Africa amid climate crisis**

Yanaelle Ntwa-nese-Akensone Bompaa (Université Catholique de Louvain, Belgique – [yanaelle.ntwa@uclouvain.be](mailto:yanaelle.ntwa@uclouvain.be))

In response to growing criticism of the Green Revolution—particularly regarding its environmental and social unsustainability—this doctoral research explores how ancestral and emerging agroecological practices in Central Africa contribute to the resilience of farming systems amid the climate crisis. Focusing on two key crops in the Democratic Republic of Congo—palm (in Bandundu and Mayombe) and sorghum (in South Kivu)—the study investigates marginalized yet ecologically significant local farming practices.

The research draws on three intersecting bodies of literature: agrarian resilience under climate change, indigenous knowledge systems, and agroecology as a science, practice, and social movement. Methodologically, it combines the FAO’s Tool for Agroecology Performance Evaluation (TAPE) with participatory sociological methods, including focus groups, to assess the ecological, social, and economic dimensions of agroecological practices in diverse contexts.

This study offers an original contribution by identifying both the limitations and potential of agroecological strategies rooted in traditional knowledge and local innovation. It argues that these practices can serve as viable pathways toward more resilient and sustainable agri-food systems. Ultimately, the research aims to inform context-sensitive agroecological transitions in Africa and to support inclusive, grounded agricultural policies that reflect the lived experiences of small-scale farmers.

## Between adaptation and hegemony: Dynamics and Controversies around climate-smart agriculture in Tshopo, Kwilu and Kongo Central

Mbuluku Faïda Andreita (Université Catholique de Louvain, Belgique – [andreita.mbuluku@student.uclouvain.be](mailto:andreita.mbuluku@student.uclouvain.be))

In the early 2000s, agriculture was widely identified as one of the major contributors to greenhouse gas emissions, contributing to an unprecedented climate crisis. This discourse has since evolved: agriculture is no longer seen merely as a source of problems, but is now recognized as a sector directly exposed to the negative effects of climate change and a bearer of adaptation and mitigation solutions.

In the provinces of Tshopo, Kwilu, and Kongo Central in the Democratic Republic of Congo, initiatives seek to promote so-called “climate-smart” agricultural practices, combining innovation, resilience, and environmental efficiency. At the same time, these approaches raise questions about how local knowledge and traditional agrarian practices are integrated, recognized, or marginalized within scientific discourse and practical implementation.

The concept of Climate-Smart Agriculture (CSA), introduced in 2010, quickly gained support from donors and governments but remains criticized for its ambiguity and potential for hegemony, particularly by farmers' organizations such as Via Campesina. This research aims to analyze the encounter between innovations promoted in the name of climate and the experiences of rural communities, in order to evaluate the real impact of CSA on food security and the well-being of small-scale producers in Tshopo, Kwilu, and Kongo Central.

## Happily ever after? – Conservation, compensations et reconfigurations communautaires autour du Parc Virunga (RDC)

Midagu Kabumba Alain (Université Catholique de Louvain, Belgique – [alain.midagu@uclouvain.be](mailto:alain.midagu@uclouvain.be))

Dans le contexte des défis contemporains liés à la conservation des écosystèmes, cette recherche interroge les tensions entre les modèles de conservation autoritaire et participatif. Alors que le premier repose sur une logique descendante, le second implique les communautés locales dans la gouvernance des aires protégées (AP). Ces dynamiques génèrent des formes de résistance et des mécanismes de compensation, notamment pour les populations autochtones et communautés locales (PACL), dont les liens avec les ressources naturelles sont profonds.

La restitution des terres, bien que rarement mise en œuvre de manière légale, constitue un enjeu central dans les débats sur la justice environnementale. Ce projet s'inscrit dans une approche interdisciplinaire, croisant les littératures sur la conservation forestière, le foncier et les conflits socio-environnementaux. Il vise à analyser les expériences communautaires de restitution spatiale – qu'elle soit formelle ou symbolique – comme manifestation de justice dans un contexte de conservation.

L'étude se focalise sur le Parc national des Virunga (PNVi), situé dans la province du Nord-Kivu en République Démocratique du Congo, pour explorer les vécus des PACL riveraines face à la restitution de leurs espaces forestiers. Elle met en lumière les tensions persistantes entre les communautés et les gestionnaires du parc, notamment autour des mécanismes de compensation et des reconfigurations sociales induites. Ce travail souligne l'urgence d'une relecture critique des politiques de conservation à l'aune de la justice environnementale, dans un contexte marqué par les effets du changement climatique et les enjeux de développement durable.

## Panel | UNU-CRIS Panel - Cross-border resource management and regional cooperation

**Chairs:**

**Frank Mattheis**

(UNU-CRIS & UGent)

**Ine Lietaert**

(UNU-CRIS & UGent)

Regional cooperation and resource management are closely intertwined in several ways. Firstly, the management of natural resources—from waterways to forests—requires authorities to cooperate at both transnational and sub-national levels. Secondly, most African countries lack the scale needed to fully develop economic sectors and leverage their natural resources. Transnational regional cooperation is therefore crucial for developing value chains, ensuring efficient energy production and distribution, and managing natural reserves. Thirdly, different types of regional organisations rely on the pooling of national resources (e.g., finances, human resources, equipment) by their members to carry out mandates and provide regional public goods.

Aiming to increase insights into the link between cross-border resource management and regional cooperation (both transnational and subnational), this panel brings together presentations focusing on various forms of regional cooperation and on diverse types of resources from multiple contexts.

### **Key words**

Regional cooperation, Cross border resources management, Regional resources, Regional organisations

### **Defending regional resources and norms:**

#### **African regional organizations' sanctions against non-paying members**

**Frank Mattheis** (UNU-CRIS & UGent, Belgium – [fmattheis@cris.unu.edu](mailto:fmattheis@cris.unu.edu))

**Ueli Staeger** (University of Amsterdam, The Netherlands/UNU-CRIS, Belgium)

Sanctions as coercive behaviour in multilateral politics constitute a complex phenomenon. Beyond the current focus on states' coercive measures, one understudied form involves regional organizations (ROs) collectively sanctioning member states for delayed payment of assessed contributions. A steady flow of financial resources is indispensable for ROs. While many ROs use earmarked funding, assessed contributions from member states remain the preferred modality. A recurrent issue in African ROs is that member states frequently fall behind on these contributions. Yet, surprisingly little is known about why African ROs vary in their responses to such arrears.

This article theorizes the significant variation in how African ROs sanction non-payment of assessed contributions. We argue that budgetary resilience and norm contestation explain ROs' reactions to unpaid assessed contributions. Higher budgetary resilience enables an RO to absorb unpaid contributions without resorting to sanctions, while less contested norms position an RO to assert itself more effectively against non-paying members through sanctions. These mechanisms capture distinct causal pathways of resource mobilization governance in ROs and jointly account for the strength of an RO's sanctioning response. By shedding light on states' resourcing practices to enforce their own rules for reliable funding, this paper contributes to research on RO resourcing and international sanctions.

## Participatory negotiation support framework towards enhancing transboundary water security in the Congo Basin Region

Nidhi Naglabatha (UNU-CRIS & UGent, Belgium – [nnagabhatla@cris.unu.edu](mailto:nnagabhatla@cris.unu.edu))

Mahmoud Radwan (University of Waterloo, Canada)

Padmi Ranasinghe (McMaster University, Canada)

Africa's abundant natural resources, particularly its transboundary water systems, present both challenges and opportunities for regional stability and sustainable development. The Congo Basin—the world's second-largest tropical rainforest and a vital hydrological system spanning nine countries—epitomizes the complexities of cross-border resource management. Despite holding nearly 30% of Africa's freshwater reserves, the region faces acute water insecurity: over half of the Democratic Republic of Congo's population lacks access to safe drinking water and sanitation.

This paradox is intensified by climate change, rapid population growth, urbanization, and fragmented governance. Shared resources such as the Congo River are essential for livelihoods, agriculture, and hydropower, yet also serve as flashpoints for diplomatic tensions among riparian states. Cross-border water management is hampered by disparities in institutional capacity, political instability, and divergent national policies. Cooperative efforts, such as the International Commission of the Congo-Oubangui-Sangha Basin (CICOS), exist but are often constrained by limited funding and coordination. The DRC, despite its resource wealth, continues to struggle with infrastructure deficits, socio-political unrest, and health crises, further exacerbating water insecurity and hindering regional collaboration.

However, these challenges also offer opportunities for transformative action. Our research introduces the Water Security-Oriented Indicators Cluster Matrix (WOSCIM), a multidimensional, indicator-based framework rooted in the UN-Water Security Conceptual Framework (2013). WOSCIM could enable riparian states to collaboratively assess, negotiate, and implement water security measures by integrating localized data, supporting participatory engagement, and fostering informed decision-making.

We argue that effective cross-border resource management in Africa requires a paradigm shift towards regional cooperation, participatory governance, and evidence-based frameworks. The WOSCIM model provides a scalable, adaptable tool for policymakers and stakeholders, facilitating the translation of water security challenges into actionable policy recommendations. Fostering regional cooperation through innovative frameworks, tools, and inclusive dialogue is critical for transforming resource-related tensions into opportunities for sustainable development and resilience in the Congo Basin and beyond.

## From neighbours to rivals: Revisiting the politics of protective territoriality across Oromia-Somali regional states in Ethiopia

Dereje Tesema Regasa (Jimma University, Ethiopia & UNU-CRIS, Belgium – [derejetesema2011@gmail.com](mailto:derejetesema2011@gmail.com))

Across Africa, subnational politics and resource governance have long attracted academic and policy attention due to their influence on national governance and regional integration. In Ethiopia's ethnocentric governance, ethnic regionalization and the resulting ethnically defined internal borders are frequently mobilized by elites, fueling conflicts over resources. Understanding ethnonational movements and the internal politics of territory requires moving beyond colonial narratives of intercommunal violence and situating interethnic relations within the broader national political-economic context.

Drawing on the case of the Oromia-Somali internal border in Ethiopia, this study unpacks how the politics of territoriality have evolved over time and are shaped by shifting alliances between ethnic groups and the state. Relations between the two neighboring ethnic groups have shifted from co-existence and socio-economic interdependence to increasing contestation under a governance system that re-mapped administrative boundaries along ethnolinguistic lines. The involvement of national and local elites in negotiating recurrent tensions over graz-

ing land, contested administrative boundaries, and water resources often exacerbates cycles of dispossession and counter-dispossession, contributing to tenure insecurity, particularly in rangeland areas.

This underscores the need to rethink and contextualize the impacts of growing political decentralization, which creates new resource borders and redefines property rights.

### **Restructuring the African peace and security architecture: Streamlining resources or limiting responsiveness?**

Jamie Pring (Universität Basel, Switzerland & UNU-CRIS, Belgium – [jpring@cris.unu.edu](mailto:jpring@cris.unu.edu))

In 2016, the African Union launched a series of structural reforms aimed at making the Union fit for purpose and enabling the efficient use of resources. Under these reforms, the AU sought to bolster its peace and security structures, as outlined in the APSA Roadmap 2016–2020, Agenda 2063, the Roadmap to Silence the Guns, and the “Kagame Report” on AUC reforms. Moreover, the AU revitalized its Peace Fund, which channels United Nations contributions to AU peace operations. However, in 2023, the reform procedures were disrupted, halting several peace and security instruments, including the Mediation Support Unit and the Continental Early Warning System, from fulfilling their mandates.

This paper aims to analyze the extent to which the AU, with its current structural configuration, fulfills its peace and security objectives, including its goal to maximize resources from member states and international organizations. The study finds that current institutional fragmentation presents both opportunities and new obstacles in conducting early warning, preventive diplomacy, and mediation.

### **Regional citizenship and mobility as political resources: Implications of the current fragmentation of ECOWAS' Free Movement Regime**

Amalie Ravn Weinrich (University of Copenhagen, Denmark – [amalie.weinrich@jur.ku.dk](mailto:amalie.weinrich@jur.ku.dk))

On 29 January 2025, Niger, Mali, and Burkina Faso formally withdrew from the Economic Community of West African States (ECOWAS), consolidating the formation of the Alliance of Sahel States (AES). This political rupture challenges not only one of the world's oldest regional blocs but also the cooperative governance of a key cross-border resource in West Africa: human mobility. The ECOWAS citizenship regime, established with the ratification of ECOWAS's Free Movement Protocol in 1979, has long served as the official framework for transnational labour, trade, and security cooperation among member states. The recent fragmentation therefore raises urgent questions about the management of mobility across borders and the viability of regional cooperation as a strategy for inclusive development, both nationally and regionally.

Based on qualitative fieldwork conducted at border posts between Ghana, Togo, Burkina Faso, and Côte d'Ivoire (October 2024–April 2025), this paper examines how state and non-state actors navigate overlapping and contested mobility regimes in a context of institutional breakdown. It argues that citizenship and mobility, often overlooked as intangible resources, are central to regional integration models, and that their disruption has implications for broader questions of political legitimacy, socio-economic interdependence, and the production of regional public goods. The paper offers empirical insights relevant to debates on African regionalism, regional cooperation, and border governance by analysing how new configurations of cooperation and exclusion are reshaping regional political geographies in West Africa.



## **Bridging policy and practice:**

### **How far has the Regional Malabo Declaration taken Africa in the fight against hunger?**

Chibuzor Charles Ubah (Alliance of Bioversity International & UNU-CRIS, Belgium – [ccubah@cris.unu.edu](mailto:ccubah@cris.unu.edu))  
Nidhi Nagabhatla (UNU-CRIS & UGent, Belgium)

The Malabo Declaration commits African Union member states to eliminating hunger by 2025, yet progress toward this goal has been uneven and remains poorly understood. While several countries have made advances in areas such as finance, trade, climate resilience, and governance, the extent to which these improvements translate into hunger reduction remains unclear. This study examines the relationship between performance in these thematic areas—measured using Comprehensive Africa Agriculture Development Programme (CAADP) Biennial Review C-scores—and outcomes under Commitment 3, which specifically targets hunger reduction.

Using a random-effects panel regression model across 55 African countries from 2017 to 2023, we identify five significant predictors of hunger reduction: agricultural GDP and poverty reduction (PC 4.1), foreign private investment (PC 2.3), multi-stakeholder coordination (PC 1.2), inclusive public–private partnerships (PC 4.2), and trade policies (PC 5.2). Investment in resilience (PC 6.2) and capacity for planning and monitoring (PC 7.1) show only marginal associations. Our findings indicate that the mere presence of institutional mechanisms is insufficient to drive hunger reduction. Rather, the structure, inclusiveness, and functionality of these mechanisms—such as whether investments reach food-insecure populations, coordination platforms influence decision-making, and policies adapt to local contexts—are what matter most.

We conclude that high performance in certain categories does not necessarily translate into tangible hunger reduction when implementation is fragmented or disconnected from local realities. These insights challenge current approaches to measuring and interpreting regional progress. As the region prepares for a post-2025 agenda, our findings underscore the need for future strategies that directly link agricultural transformation to hunger reduction through targeted interventions and accountable institutions at both regional and national levels.

# ABSTRACTS INDIVIDUAL PRESENTATIONS

# Evaluating the impact of integrated soil fertility management under deficit irrigation on subsurface flow dynamics

**Abdu Yimer Yimam**

(Department of Environment, Ghent University, Belgium; Faculty of Civil and Water Resource Engineering, Bahir Dar Institute of Technology, Bahir Dar University, Ethiopia)

**Desale Kidane**

(Department of Natural Resource Management, Bahir Dar University, Ethiopia)

**Seifu A. Tilahun**

(Faculty of Civil and Water Resource Engineering, Bahir Dar Institute of Technology, Bahir Dar University, Ethiopia; International Water Management Institute (IWMI), Cantonments, Accra, Ghana)

**Margaret Chen**

(Hydrology and Hydraulic Engineering, Vrije Universiteit Brussel, Belgium)

**Abebech Abera**

(Faculty of Civil and Water Resource Engineering, Bahir Dar Institute of Technology, Bahir Dar University, Ethiopia)

**Mekete Dessie**

(Faculty of Civil and Water Resource Engineering, Bahir Dar Institute of Technology, Bahir Dar University, Ethiopia)

**Kristine Walraevens**

(Laboratory for Applied Geology and Hydrogeology, Department of Geology, Ghent University, Belgium)

**Enyew Adgo Tsegaye**

(Department of Natural Resource Management, Bahir Dar University, Ethiopia)

**Amaury Frankl**

(Department of Geography, Ghent University, Belgium)

**Wim Cornelis**

(Department of Environment, Ghent University, Belgium)

In the face of climate change and a rapidly growing global population, the efficient utilization of resources is essential to achieve food security. In this context, integrating soil management with deficit irrigation practices represents a promising strategy to enhance crop productivity. This study aimed to investigate the effects of Integrated Soil Fertility Management (ISFM) and Deficit Irrigation (DI) on soil water flow dynamics in the Lake Tana sub-basin.

Field experiments were conducted during two irrigation seasons (2018/19 and 2019/20) in the Koga irrigation scheme, located in northern Ethiopia. Wheat was grown as a test crop on clay-textured Nitisol soil. The experiment followed a randomized complete block design, incorporating five ISFM and DI treatments. ISFM treatments included liming at rates of 1430, 1150, and 860 kg ha<sup>-1</sup> (L1, L2, and L3, respectively), manuring at 3000 kg ha<sup>-1</sup> (M), and a non-amended control (C). The DI levels were based on crop evapotranspiration (ET<sub>c</sub>) at 80% ET<sub>c</sub>, 60% ET<sub>c</sub>, and 50% ET<sub>c</sub>, with 100% ET<sub>c</sub> used as the control. Irrigation was administered using a calibrated partial flume installed at the inlet of each experimental plot. Soil samples were collected from the field, and hydraulic properties were determined in the laboratory. Soil water content was measured gravimetrically at various growth stages. All collected data were used to calibrate and validate the Hydrus 1D model, which simulated soil water flow and root water uptake. A high coefficient of determination ( $R^2 > 0.94$ ), a low sum of squared differences ( $SSQ < 0.1 \text{ m}^3 \text{ m}^{-3}$ ), and a low RMSE ( $< 0.025 \text{ m}^3 \text{ m}^{-3}$ ) for soil water content across all five soil fertility treatments demonstrated good model

performance during calibration. The model also performed well during validation, with low RMSE ( $< 0.025 \text{ m}^3 \text{ m}^{-3}$ ), high  $R^2$  ( $> 0.7$ ), and a high Willmott index of agreement ( $d > 0.7$ ) for all ISFM treatments.

Results indicated that root water uptake increased by 11%, 10%, 8%, and 6% in the ISFM treatments L1, L2, L3, and M, respectively, compared with the control during the first irrigation season when irrigation was supplied at full crop requirement. Similarly, in the second irrigation season, root water uptake increased by 5–14% across ISFM treatments compared to the control, confirming the potential of ISFM to improve root water uptake.

Under deficit irrigation (80% ETc), root water uptake declined by 15–17% in the limed and manured plots compared with full irrigation, while in the control (unamended soil), uptake was reduced by 18%. Further reductions in irrigation water to 60% ETc and 50% ETc decreased root water uptake by 31–35% and 34–38%, respectively, across ISFM treatments in both irrigation seasons. Correspondingly, ISFM enhanced relative yield under full irrigation by 7–12% in the first season and 6–15% in the second season compared with the control. Under deficit irrigation, yield reductions became more pronounced as stress increased: at 80% ETc, relative yield declined by 25–31% across ISFM treatments, while at 60% ETc and 50% ETc, the reductions reached 38–44% and 44–49%, respectively, compared with full irrigation.

Wheat sensitivity to water stress depended on its developmental stage. Across all irrigation scenarios, the crop did not experience stress during the first 20 days. The study found that the 12-day irrigation interval proposed by the Koga Water User Association was not appropriate. Under full irrigation, the crop experienced 6–8 days of water stress during the developmental to late growth stages, with only 4–6 days of optimal root water uptake per irrigation cycle. Under 80% ETc, optimal root water uptake occurred for only 3–5 days per cycle (7–9 stress days), while under 60% ETc and 50% ETc, optimal uptake was achieved for no more than two days per cycle. For optimal root water uptake throughout the crop period, irrigation should be applied every six days under full irrigation, every three days under 80% ETc, and every two days under 60% ETc and 50% ETc. The results of this study provide valuable insights for stakeholders to support sustainable water resource management in the Lake Tana Basin and beyond.

#### Keywords

Drought Stress, Hydrus 1D, Inverse Modelling, Relative Yield, Root Water Uptake

# Capacité des produits cartographiques mondiaux à caractériser les écosystèmes arides du Bénin : Hétérogénéité écologique et performances des cartes globales

## Agassounon Mahougnon Bill

(Unité Biodiversité et Paysage, Gembloux Agro-Bio Tech, Université de Liège, Belgique; Laboratoire d'Ecologie, de Botanique et de Biologie Végétale (LEB), Université de Parakou, Bénin – [mbagassounon@uliege.be](mailto:mbagassounon@uliege.be) & [billagassounon@gmail.com](mailto:billagassounon@gmail.com))

## Assede Emeline S. P.

(Laboratoire d'Ecologie, de Botanique et de Biologie Végétale (LEB), Université de Parakou, Bénin; Département des Sciences des Plantes et du Sol, Université de Pretoria, Pretoria, Afrique du Sud – [assedeemeline@gmail.com](mailto:assedeemeline@gmail.com))

## Bastin Jean-François

(Unité Biodiversité et Paysage, Gembloux Agro-Bio Tech, Université de Liège, Belgique – [jfbastin@uliege.be](mailto:jfbastin@uliege.be))

## Biaou S. S. Honoré

(Laboratoire d'Ecologie, de Botanique et de Biologie Végétale (LEB), Université de Parakou, Bénin – [hbiaou@gmail.com](mailto:hbiaou@gmail.com))

Les écosystèmes forestiers du nord du Bénin, caractérisés par une végétation clairsemée et à feuillage caduc, constituent des formations écologiques essentielles mais vulnérables face aux pressions anthropiques croissantes. Toutefois, leur cartographie précise demeure problématique en raison de leur hétérogénéité spatiale et structurale. Cette étude propose une analyse comparative de cartes de végétation mondiales afin d'évaluer leur capacité à caractériser les écosystèmes arides du Bénin, en tenant compte des facteurs d'hétérogénéité verticale, horizontale et de biodiversité. Notre recherche s'appuie sur l'évaluation de quatre produits cartographiques disponibles sur Google Earth Engine : *Global Forest Change* (GFW), *Vegetation Continuous Fields* (VCF), *Dynamic World* (DW) et *Copernicus Global Land Cover* (CGLS-LC100). Les données de terrain ont été collectées sur 62 placettes de 4 900 m<sup>2</sup>, sélectionnées en fonction des différentes classes d'occupation du sol dans le complexe forestier des Monts Kouffé, de Wari-Marô et de l'Ouémé Supérieur. La quantification du couvert arboré, arbustif et ligneux a été réalisée à l'aide de la méthode d'échantillonnage par points d'interception. Le couvert ligneux a été calculé comme la somme des couvertures arborée et arbustive. Pour chaque placette, toutes les espèces présentes ont été identifiées, et le diamètre à hauteur de poitrine (DBH) ainsi que la hauteur totale de chaque arbre ont été mesurés. L'analyse statistique a combiné des modèles de régression bêta mixtes pour évaluer l'influence des classes d'occupation du sol et des types de satellites sur les estimations de couverture, des régressions linéaires pour comparer les données satellitaires aux mesures de terrain, ainsi que des analyses de corrélation entre les indices de biodiversité, les métriques structurelles et les erreurs d'estimation. Les résultats révèlent une variabilité significative dans la précision des estimations selon le type de couverture végétale et le produit cartographique. Pour la couverture arborée, DW et CGLS-LC100 présentent les meilleures performances ( $R^2 = 0,54$  ; MAEr = 0,20), tandis que VCF montre la corrélation la plus faible ( $R^2 = 0,08$  ; MAEr = 0,30). Concernant la couverture arbustive, les performances sont globalement plus faibles, CGLS-LC100 affichant un  $R^2$  modeste de 0,20. C'est pour la couverture ligneuse totale que les estimations s'avèrent les plus fiables, DW se distinguant particulièrement ( $R^2 = 0,78$  ; MAEr = 0,08). L'analyse démontre également que les classes d'occupation du sol, les types de satellites et leur interaction influencent significativement les estimations. Les modèles à effets mixtes surpassent systématiquement les modèles à effets fixes, soulignant l'importance de prendre en compte la variabilité spatiale entre parcelles. De même, les placettes présentant une faible variabilité en hauteur et en DBH, associée à une diversité spécifique réduite, montrent les meilleures précisions d'estimation cartographique. Cette observation suggère que l'homogénéité structurelle et la simplicité floristique facilitent la détection et l'interprétation satellitaire. Ces résultats mettent en évidence la



nécessité de développer des approches cartographiques adaptées aux spécificités des écosystèmes arides d'Afrique de l'Ouest, afin de corriger les biais d'estimation induits par les méthodes conventionnelles.

#### **Mots-clés**

Couverture arborée, Couverture arbustive, Couverture ligneuse, Télédétection, Bénin

# Mechanism of monodominance of *Gilbertiodendron dewevrei*, a hyperdominant tree species in the Congo Basin

## Alain Kadorho

(UGent-Woodlab, Laboratory of Wood Technology, Department of Environment, Ghent University, Coupure Links 653, B-9000 Gent, Belgium; Université Officielle de Bukavu, Faculté des Sciences, Département de Biologie, B.P. 570, Bukavu, Democratic Republic of Congo; Ecole Régionale d'Aménagement et de gestion Intégrées de Forêts et Territoires tropicaux, Kinshasa, RDC – [Sheria.Kadorho@UGent.be](mailto:Sheria.Kadorho@UGent.be))

## Blanca Van Houtte

(UGent-Woodlab, Laboratory of Wood Technology, Department of Environment, Ghent University, Coupure Links 653, B-9000 Gent, Belgium; Royal Museum for Central Africa, Wood Biology Service, Leuvensesteenweg 13, B-3080 Tervuren, Belgium – [Blanca.VanHoutteAlonso@UGent.be](mailto:Blanca.VanHoutteAlonso@UGent.be))

## John Tshibamba

(Université Officielle de Mbuji-Mayi, Faculté des Sciences appliquées, Mbuji-Mayi, Democratic Republic of Congo – [johntshibamba@gmail.com](mailto:johntshibamba@gmail.com))

## Seintsheng Ntamwira

(Université Officielle de Bukavu, Faculté des Sciences, Département de Biologie, B.P. 570, Bukavu, Democratic Republic of Congo – [yagirwa@gmail.com](mailto:yagirwa@gmail.com))

## Jean-Pierre Messina

(Ecole Régionale d'Aménagement et de gestion Intégrées de Forêts et Territoires tropicaux, Kinshasa, RDC; Université Notre Dame du Kasayi, Kasayi, Democratic Republic of Congo, – [jmessina0@gmail.com](mailto:jmessina0@gmail.com))

## Jan Van den Bulcke

(UGent-Woodlab, Laboratory of Wood Technology, Department of Environment, Ghent University, Coupure Links 653, B-9000 Gent, Belgium – [Jan.VandenBulcke@UGent.be](mailto:Jan.VandenBulcke@UGent.be))

## Wannes Hubau

(UGent-Woodlab, Laboratory of Wood Technology, Department of Environment, Ghent University, Coupure Links 653, B-9000 Gent, Belgium; Royal Museum for Central Africa, Wood Biology Service, Leuvensesteenweg 13, B-3080 Tervuren, Belgium – [Wannes.Hubau@UGent.be](mailto:Wannes.Hubau@UGent.be))

*Gilbertiodendron dewevrei* is the most hyperdominant tree species in the Congo Basin and forms monodominant patches within otherwise diverse old-growth mixed tropical forests. Despite its abundance, the ontogeny of its monodominance remains surprisingly poorly understood. Here, we present charcoal identification results from 611 charcoal fragments obtained from 49 radiocarbon-dated charcoal assemblages, sampled in 30 trenches excavated near permanent forest inventory plots in both mixed forests and *G. dewevrei*-dominated forests within the Yangambi Reserve (central Democratic Republic of the Congo).

We find that *G. dewevrei* is absent from present-day mixed forests in Yangambi but occupies 60–90% of the basal area in monodominant forest patches. These patches are very small (<20 ha) and confined to hydromorphic soils. However, the upper charcoal assemblages in *G. dewevrei* forests are significantly younger than those in mixed-species forests (119 vs. 314 cal yr BP, respectively;  $p < 0.001$ ). Only 41 charcoal fragments were identified as *G. dewevrei*, and these were restricted to deeper (>100 cm) and older (>4000 cal yr BP) charcoal assemblages.

Our results from Yangambi contrast with previous analyses from Ituri, where *G. dewevrei* monodominant forests occupy larger areas (up to 1000 ha) and are much older (>700 cal yr BP). Yet, in both sites, *G. dewevrei* is almost absent from the palaeorecord. Our findings contribute to understanding the mechanisms underlying the estab-

lishment and expansion of *G. dewevrei* monodominant stands. We propose that they originate as small stands along river valleys (as in Yangambi) following significant disturbance (e.g., fire) of mixed forests, and subsequently expand toward plateaus and drier soils (as in Ituri) if left undisturbed for centuries. We postulate the new hypothesis that patch size may serve as an indicator of the age of *G. dewevrei* monodominant stands, a proposition that warrants further testing through additional forest inventory and charcoal analyses.

#### Keywords

Congo basin, Rainforest ecology, Mechanism of monodominance, *Gilbertiodendron dewevrei*, Hyperdominance, Single-species dominance, Tropical forest

# Causes and processes of land degradation in the rural Eastern Cape of South Africa: Views and experiences from indigenous communities

**Chenai Murata**

(Department of African Studies, University of Vienna, Austria – [Chenai.murata@univie.ac.at](mailto:Chenai.murata@univie.ac.at))

**Gladman Thondhlana**

(Department of Environmental Science, Rhodes University, South Africa)

The re-emergence of indigenous knowledge in the late 20th century—gaining recognition in both academia and policy—coincided with the intensification of environmental challenges across the globe. In South Africa's Eastern Cape province, land degradation has long been, and continues to be, the most pressing environmental problem, manifesting in several forms including deteriorating freshwater resources, soil erosion, declining pasturelands, and disappearing forests. Land degradation has triggered a series of chain-reaction effects, including deagrarianization and the collapse of livestock farming—directly affecting rural communities.

Since the mid-20th century, with the implementation of the Betterment Program, the South African government and numerous private-sector organizations have predominantly relied on scientific knowledge to understand the causes and processes of degradation and to design intervention initiatives. However, land degradation in the rural Eastern Cape persists, showing no signs of abatement.

Historically, local communities have tended to resist externally designed interventions. During the apartheid era, resistance was largely active, with communities boycotting intervention initiatives. In the democratic era, resistance has become more passive: communities accept and implement intervention strategies only for the duration of externally funded projects, but revert to their traditional environmental management practices once project implementers leave.

Through in-depth interviews and life histories, we collected data on local people's perceptions of the causes and processes of land degradation from 83 participants drawn from three villages: Colana, Gogela, and Nozitshena. We found that indigenous communities possess extensive knowledge of land degradation, which revolves around a biophysical–cultural complex situated within a historicized flow of events. The cultural dimension, shaped by local worldviews and epistemologies, is often ignored in scientific studies of land degradation.

We argue that within traditional communities, scientific knowledge alone is insufficient to develop an accurate understanding of the phenomenon of land degradation and of how local people interact with it. Integrating indigenous knowledge not only helps to develop a more holistic understanding of the phenomenon, but also aligns research more closely with local perspectives and lived experiences, thereby bridging the gap between theory and reality. Moreover, it has the potential to reveal culturally embedded and historically rooted anthropogenic factors that contribute to, or exacerbate, land degradation.

## Keywords

Indigenous knowledge, Land degradation, South Africa, Conservation, Eastern Cape

# Croissance urbaine planifiée et non planifiée : cartographie des frontières invisibles dans la ville en plein essor de Kasumbalesa

Christian Koba Fazili

(Department of Conflict and Development Studies, Ghent University, Belgium – [Koba.fazili@UGent.be](mailto:Koba.fazili@UGent.be))

La libéralisation du secteur minier congolais et l'ouverture de la douane aux petits commerçants transfrontaliers à la frontière entre la RDC et la Zambie ont entraîné une croissance urbaine rapide et souvent anarchique dans la ville de Kasumbalesa. L'expulsion massive des mineurs artisanaux des mines industrielles de l'ex-Katanga a provoqué des déplacements internes, de nombreux individus changeant d'activité, fuyant l'insécurité et la pauvreté des sites miniers et des zones environnantes. Dans ce contexte, le corridor « Bilanga », un passage conçu pour réguler et permettre la circulation des petits commerçants transfrontaliers à Kasumbalesa, domine l'économie de la ville et de ses quartiers, mettant en évidence le contraste entre les dynamiques planifiées et non planifiées qui se sont déroulées au cours des trois dernières décennies.

À travers une approche cartographique, cet article retrace la croissance urbaine et révèle simultanément les frontières invisibles qui émergent dans cette ville frontalière en plein essor — des frontières spatiales, sociales et politiques qui ne sont pas toujours visibles physiquement, mais qui structurent profondément l'organisation urbaine. L'émergence d'interactions entre les politiques officielles d'urbanisme et les pratiques informelles des habitants influence l'accès aux services et les relations sociales. L'article analyse l'impact de ce modèle de croissance divergent sur la population de Kasumbalesa, soulignant l'importance d'intégrer les dimensions invisibles dans la planification urbaine afin de promouvoir un développement plus inclusif. L'enquête de terrain s'est déroulée entre 2018 et 2025.

## Mots clés

Urbanisme, Frontière invisible, Migration, Déplacement interne, Kasumbalesa



# South Africa–Namibia green hydrogen corridor: Skills development

**Craig McGregor**

(University of Stellenbosch, South Africa – [craigm@sun.ac.za](mailto:craigm@sun.ac.za))

**Paul Thiele**

(University of Stellenbosch, South Africa – [pault@sun.ac.za](mailto:pault@sun.ac.za))

**Cristina Trois**

(University of Stellenbosch, South Africa – [cristinatrois@sun.ac.za](mailto:cristinatrois@sun.ac.za))

**Lorenzo Squintani**

(University of Stellenbosch, South Africa)

The favourable meteorological conditions for green hydrogen production in South Africa and Namibia open up new economic pathways and can significantly support the energy transition. Consequently, a corridor connecting production hubs in Lüderitz, Boegoebaai, Prieska, and Saldanha Bay was initiated in 2024 through a cross-border pipeline system.

This study identifies critical skills gaps essential for establishing a successful hydrogen economy, categorized into five areas: technical, managerial, digital, ecosystem, and societal embedding. The development of the corridor is structured in three phases:

1. Development of individual production hubs
2. Implementation of the north–south corridor
3. Expansion into a west–east connection to industrial consumers

To meet these evolving demands, the establishment of hydrogen corridor skill centres at each cluster location is recommended. These centres would address skills requirements by bridging the gap between industry needs and educational outcomes, while also supporting the Just Energy Transition through the prioritization of local employment.

## Keywords

Green hydrogen skills development, Hydrogen corridor, Just energy transition

# African resources in the reconstruction of Europe after the Second World War

Danelle van Zyl-Hermann

(Department of History, University of Basel, Switzerland – [danellevanzyl-hermann@unibas.ch](mailto:danellevanzyl-hermann@unibas.ch))

After 1945, faced with devastated cities, infrastructure, industries, and economies in the wake of the Second World War, European imperial powers such as Britain, France, and Belgium turned to their African colonies as sources of raw materials and revenue to support metropolitan reconstruction. While scholars widely acknowledge that European postwar needs were a key factor in the subsequent “second colonial occupation” of Africa, the actual relationship between postwar reconstruction and late-colonial development remains poorly understood.

This paper proposes using specific African commodities as a lens to investigate the political economy of African resources in relation to European reconstruction. It first provides a wide-ranging historiographical critique: scholarship on late-colonial Africa overwhelmingly focuses on development and decolonisation, yet its rich explorations of European-directed development plans, practices, and their consequences risk reifying this period solely in terms of the flow of resources (funds, expertise, and equipment) from the global North, without acknowledging the counterflows of raw materials from Africa. Narratives of European postwar reconstruction, meanwhile, remain overwhelmingly West- and Eurocentric, seemingly oblivious to this imperial dimension. Although recent scholarship has begun to highlight the colonial aspects of postwar European integration, material elements remain neglected. As long as these two historiographies remain disconnected, postwar European development appears as largely self-generated, while late-colonial African development is understood primarily as the product of external interventions. Such understandings may inadvertently reinforce longstanding racial stereotypes in the present.

This paper addresses this gap by examining the role of African resources in the reconstruction of Europe after WWII through a focus on three commodities: West African timber, Southern African asbestos, and Central African copper. These resources were crucial to physical reconstruction and significant foreign exchange earners; all were either unavailable (asbestos, copper) or insufficiently available (timber) in Europe. My primary analytical focus is on tracing the debates, strategies, and contestations surrounding access to and distribution of these key resources during the immediate postwar decade, amid ongoing shortages, soaring demand, and multiple domestic and international pressures. I offer preliminary findings on interactions within and between different state actors (departments, ministries, committees) and international actors (organisations, specialist bodies), as well as their relations with commercial actors involved in resource extraction and supply.

I argue that this focus on African commodities reveals multiple processes of postwar reconstruction at various scales (domestic, imperial, continental, and international) demonstrating how different actors configured themselves as allies or rivals across these projects and how the same actors struggled with conflicting priorities. This project is the first to pursue an integrative, multiscale analysis of the postwar period, a foundational moment for the subsequent political and economic trajectories of both Europe and Africa. By using strategic African commodities as a lens, it clarifies the often-stated yet seldom-investigated relationship between European reconstruction and African development, challenges conventional understandings of mid-century development in both regions, and foregrounds the role of African resources in shaping the postwar order.

## Keywords

Postwar, Reconstruction, Development, Raw materials, Coloniality

# (Im)materiality and polymorphous resources: The carceral life of things at the Makala Central Prison

**Denis Augustin Samnick**

(Institute of Development Policy, University of Antwerp, Belgium – [denisaugustinsamnick@uantwerpen.be](mailto:denisaugustinsamnick@uantwerpen.be))

Within Makala Central Prison in Kinshasa, a variety of material objects circulate. Taking advantage of the porous nature of the prison walls, these objects sometimes evade security surveillance, find their way into administrative offices, and move between detention wards before being used and misused by inmates. They trigger fights, foster, separate, and repair friendships, and provoke enmities. They are the subject of prayers, incantations, strategies, and numerous interactions. They are used to feed and starve, to trade and assist, to escape from prison, to kill and stab, but also to heal, reward, and build circumstantial solidarity.

When appropriated by inmates, magistrates, prison guards, humanitarian workers, and visitors, the objects circulating within Makala prison become social and economic resources and instruments of power. In their absence, they inspire fantasies, covetousness, and social tactics aimed at appropriating them. How do interactions within prisons strip objects of their originally intended use as defined by manufacturers or official standards, thereby transforming them into markers of carcerality? What are the socioeconomic circumstances in which objects are exchanged, appropriated, fantasized about, mythologized, or mystified by those living and working in prison?

Addressing these questions requires a Congolese, African, and prison-centered re-reading of the seminal work edited by Arjun Appadurai (1988) on the social life of things. By highlighting the carceral life of objects, this study elucidates the ways in which objects are conceptualized, used, and appropriated in Congolese prisons. It demonstrates that prison, as a sociopolitical laboratory of organized scarcity, blurs the line between materiality and immateriality. Objects become vital resources imbued with an almost mystical potential: some inmates possess, sell, share, or exchange them, while others wait in vain, steal, loot, hoard, or suffer from their absence.

This study shows that objects circulating in Makala prison are polymorphous resources that shape the carceral ecology. They are subject to multiple forms of animism (Ménard, 2020), flourishing and evolving according to inmates' imaginations. They are also central to both a value economy (Le Marcis and Faye, 2019) and a symbolic economy (Lassègue, 2009), carrying context-specific meaning inseparable from the political realities of the Congolese landscape. Empirically, this research is based on eight months of participant observation and more than 80 in-depth interviews with inmates, prison guards, magistrates, and humanitarian workers at Makala Central Prison. These interviews were supplemented by collective research involving all aforementioned actors. Fieldwork was conducted in January–February 2022, July–August 2022, January–February 2023, October 2023, and January 2024.

## Keywords

Polymorphous resources, Carcerality, Carceral life of things

# Bantu Languages amid natural resource preservation strategies and ecosystem protection in Tanzania

**Dietram Efrem Mgeni**

(Linguistics and resources, University of Dar es Salaam, Tanzania – [dietrammgeni1@gmail.com](mailto:dietrammgeni1@gmail.com)  
& [dietram.mgeni@muce.ac.tz](mailto:dietram.mgeni@muce.ac.tz))

**Alphonse Jamal Sadiki**

(Linguistics and resources, University of Dar es Salaam, Tanzania – [alphonse.jamal@gmail.com](mailto:alphonse.jamal@gmail.com)  
& [alphonse.sadiki@duce.ac.tz](mailto:alphonse.sadiki@duce.ac.tz))

In today's rapidly changing world, Bantu languages are increasingly pushed to the brink of extinction, losing their essential role from one generation to the next. One often overlooked aspect of Bantu languages is their potential contribution to sustainable development, particularly in advancing the 13th and 15th United Nations Sustainable Development Goals (SDGs): *Climate Action* ("to combat climate change") and *Life on Land* ("to protect, restore, and promote sustainable terrestrial ecosystems, manage forests, combat desertification, and halt biodiversity loss").

This research paper focuses on uncovering the value that Bantu languages can offer in the fight against climate change and in the protection of natural resources in Tanzania. The study was conducted around major mining sites: Geita (gold), Chunya (gold), Namtumbo (uranium), and Mererani Hills (tanzanite), and their surrounding environments. A mixed-methods approach was used, combining purposive sampling with ethnolinguistic fieldwork, to explore how Bantu languages encode ecological knowledge related to natural resource management.

Findings reveal, on the one hand, that English and Swahili are the dominant languages in Tanzania's mining and environmental sectors, as most knowledge and technical concepts are expressed in these languages, while Bantu languages lack equivalent vocabularies and terminologies. On the other hand, Bantu languages currently make only a limited contribution to natural resource protection. This situation reflects the fact that most Bantu languages are neither well documented nor fully integrated into all domains of social and economic life.

The results suggest that unless urgent measures are taken to integrate local community languages into broader frameworks for environmental protection, both in mining and biodiversity management, sustainable development will remain an unattainable ideal for developing countries such as Tanzania. The study therefore calls for collective efforts to engage all local languages in advancing the Sustainable Development Goals.

## Keywords

Bantu languages, Natural resources, Ecology, Biodiversity and climate change

# Knowledge networks and ceramic traditions in the Congo Basin: Indigenous technological decisions as historical resources

Dirk Seidensticker

(Goethe University Frankfurt, Germany – [dirk.seidensticker@gmail.com](mailto:dirk.seidensticker@gmail.com))

The transformation and eventual disappearance of pottery production in the Congo Basin, both in the near and distant past, had a significant impact on community identities, territoriality, and regional interaction networks. This presentation examines knowledge transmission encoded in pottery production techniques, raw material choices, and vessel typologies within prehistoric potters' communities.

Drawing on novel petrographic and geochemical analyses from multiple archaeological sites in the Congo Basin, this research—which was funded by the FWO from 2021 to 2024—demonstrates how communities relied predominantly on distinct clay sources, such as fluvial clays rich in sponge spicules, reflecting sophisticated local knowledge of natural resources. These materials, regularly used without tempering, challenge assumptions of low technological complexity and reveal an enduring yet nuanced understanding of environmental sourcing and pottery technology. Primary shaping techniques, including various approaches to the ring-drawing technique, not only signal trans-generational knowledge transfer but also mark distinct chaînes opératoires that differentiate regional groups.

The archaeological record indicates an initial disruption of these knowledge systems as early as the 5th to 6th century CE, coinciding with a supra-regional setback in human activity across Central Africa. The subsequent disappearance of pottery groups and lack of continuity in stylistic and technological traditions suggest a breakdown in the social mechanisms underpinning knowledge retention and transmission. This disjunction, interpreted through the lens of archaeological data, illustrates how indigenous knowledge systems were historically vulnerable to demographic pressures.

By centering the analysis on indigenous knowledge systems—here embedded in the materiality of pottery production techniques—this research reframes archaeological ceramics not merely as chronological markers but as dynamic expressions of resource use, social learning, and communal identity. In doing so, it contributes to broader discussions on how locally rooted, practice-based knowledge can be valorized in modern cultural heritage preservation efforts. It further invites a reconsideration of how we categorize and value “knowledge,” emphasizing the need to highlight indigenous knowledge systems, while also drawing attention to their fragility in the face of systemic disruptions and the importance of safeguarding them through interdisciplinary, community-engaged research.

## Keywords

Indigenous knowledge systems, Pottery technology, Congo Basin archaeology, Knowledge transmission, Cultural heritage preservation

# (Rural) Resources and communities: Historical pathways of the cement industry in Katana and Kabimba, Eastern Democratic Republic of Congo

---

**Divin-Luc Bikubanya**

(Institute of Development Policy, University of Antwerp, Belgium – [divin-luc.bikubanya@uantwerpen.be](mailto:divin-luc.bikubanya@uantwerpen.be))

The historical links between resources and local communities remain under-researched in the existing empirical literature on extractive industries. This is particularly evident in the case of industrial minerals such as limestone and sand, which are extensively used in the production of an essential modern material: cement. This paper examines the development and decline of the cement industry in Katana and Kabimba in eastern Democratic Republic of Congo (DRC) since the mid-1950s.

The analysis draws on a comprehensive dataset sourced from archival records, complemented by 43 in-depth interviews and five focus groups with diverse stakeholders in Katana and Kabimba. In these areas, the growth and contraction of industries have impacted rural communities in multiple ways. Traces of the past influence not only construction practices—such as building with cement versus building with planks or mud—but also local institutional governance, including interactions between local authorities and investors. At the same time, the collective memory of workers serves as a source of hope, grounded in the industrial prosperity of the 1980s. The insights provided by these intertwined historical dynamics offer an important basis for understanding present and future community aspirations and needs.

## **Keywords**

Cement, Resources communities, Industrialisation, Katana, Kabimba



# What's in a crop? A contextual investigation of vulnerability and resilience within the organic (pyrethrum) industry in Tanzania

Edwin Otieno Ondiege

(Center for Anthropological Research of Affect and Materiality, Department of Languages and Cultures, Ghent University, Belgium – [edwin.otieno@ugent.be](mailto:edwin.otieno@ugent.be))

This paper draws on ten months of ethnographic fieldwork to examine the trajectory of pyrethrum production in Tanzania, a colonial-era crop first introduced in the 1930s. Initially restricted to white settler farmers, pyrethrum production has experienced fluctuations in fortunes, most recently experiencing a resurgence driven by rising global demand for natural insecticides. The economy of Tanganyika developed primarily through the expansion of cash crops for export, among which pyrethrum—known as *Pareto* in Kiswahili—was prominent.

Pyrethrum production has nearly doubled over the last five years due to increased farmer responsiveness, expanded processing capacity, and government interventions facilitating the sector's liberalisation through privatization. The revival of the industry offers a viable opportunity for small-scale farmers to earn a steady income, enhancing livelihood stability. However, these narratives of revival are contestable given the identity, market, and political complexities within the pyrethrum value chain, which raise questions about fairness, transparency, and benefit distribution. Its position remains contested amid what I describe as relational frictions, manifested in culturally, socially, politically, and economically situated entanglements that complicate claims to legitimacy and advantage.

The industry is largely shrouded in secrecy and dominated by multinational companies. Locals often describe pyrethrum as *zao la ziada* ("surplus crop"), *poison ya mzungu* ("the white man's poison"), *Pareto ni kama maziwa ya ng'ombe* ("Pareto is like cow's milk"), or *inalipa kama benki* ("it pays like a bank"). These vernacular expressions reveal the crop's ambiguous status within local agrarian imaginaries. Unlike staple crops such as maize or beans, and other cash crops like avocado or tobacco—which are embedded in subsistence cycles, kinship economies, and seasonal routines—pyrethrum occupies an elusive position, resisting the normative agro-logics that structure the cultivation, exchange, and meaning of other crops.

This contrast also reflects differing perceptions of pyrethrum's value: global biopesticide producers and local off-takers view it as a crop of considerable economic potential. Yet this potential remains partially obscured, as the processes and profits from value creation beyond the powder extract for export are discretely controlled by opaque networks of brokers, processors, and exporters. This paper explores pyrethrum's entanglement in historical and contemporary tensions surrounding identity, hope, exploitation, and ecological value within Tanzania's agrochemical landscape. It traces how various actors—including local communities, government bodies, and transnational organizations—imagine, negotiate, and contest pyrethrum's viability through everyday conversations about the crop's future, policy frameworks, market-driven cooperatives, and shifting transnational networks.

## Keywords

Viability, Pareto, Ecological futures, Agrarian imaginaries, Relational frictions

# Cattle and landscapes: Environmental legacies of the cattle industry in twentieth-century Katanga, Democratic Republic of the Congo

Elene Vernaeve

(Department of History, Ghent University, Belgium – [Elene.Vernaeve@UGent.be](mailto:Elene.Vernaeve@UGent.be))

This paper examines the long-term ecological effects of colonial cattle farming in Katanga, a region primarily known for its mining activities. Whereas existing research on colonial food production for growing labour forces and urban populations has mainly focused on crop production, this study shifts attention to cattle introduced to provide meat and dairy products. Drawing on archival materials and fieldwork conducted in Katanga in 2025 and 2026, the paper traces colonial attempts to create a self-reliant meat supply system. Tens of thousands of cattle were imported into a region where only small African herds had previously been maintained by communities in the Haut-Lomami district and along the Angolan border.

The establishment of a cattle industry was marked by trial and error and profoundly transformed the environment in long-lasting ways. Cattle companies received vast land concessions, ranging from 10,000 to 300,000 hectares, although much of this land was initially considered unsuitable for cattle farming. This prompted both short- and long-term environmental modifications. Deforestation and removal of low-productive flora occurred to provide construction materials and create pastures, often restructuring indigenous land-use systems under the guise of “protecting” the land from “unsustainable” and “inefficient” activities. Companies also introduced high-yielding non-native grasses and fodder crops to enhance productivity. These processes can be situated within broader colonial extractivist logics, where European cattle were raised to maximize productivity in the shortest time possible. Meanwhile, native species—including wildlife, insects, and indigenous cattle—were perceived by colonial actors as disease vectors, resource competitors, or economic disruptors. These non-human animals were monitored and, in some cases, eradicated in efforts to engineer landscapes for capitalist development, accelerating habitat destruction, biodiversity loss, and soil exhaustion.

Yet the environmental transformations following the introduction of cattle ranching were not merely top-down impositions of colonial power, but contested and dynamic processes shaped by the interactions of multispecies actors. Through long-distance herding and livestock mobility across varied terrains, cattle reshaped the landscape in multiple ways. Insects emerged as particularly transformative agents: locusts decimated pastures, mosquitoes propagated zoonotic diseases, and termites compromised ranching infrastructure. Preliminary findings indicate that insects often exceeded colonial control mechanisms, continuously reshaping human decisions, business trajectories, and spatial occupation.

By situating cattle activities within broader histories of extractivism, this paper explores how colonial livestock regimes were central to environmental change and became entangled with processes of globalizing capitalism. Colonial extractivism is thus framed not solely as an economic system but as a multispecies encounter. This approach opens discussions on the long-term ecological legacies of colonial livestock regimes and the resilience or disappearance of life in the wake of extractive economies.

## Keywords

Cattle farming, Colonial extractivism, Multispecies interactions, Environmental change, Belgian Congo

# Assessing floristic diversity and carbon stock recovery along secondary succession in the Congo Basin forests

## Eli Mutwedu Mwishingo

(Ecole Régional Post-Universitaire d'Aménagement et de gestion Intégrés des Forêts et territoires Tropicaux, Kinshasa, Democratic Republic of the Congo; Université Officielle de Bukavu, Domain of Agricultural and Environmental Sciences, Bukavu, Democratic Republic of the Congo; Université Catholique de Bukavu, Faculty of Agricultural Sciences, Bukavu, Democratic Republic of the Congo; Wood laboratory of Yangambi, Institut National pour l'Étude et la Recherche Agronomiques (INERA/Yangambi), Democratic Republic of the Congo – [mutwedueli@gmail.com](mailto:mutwedueli@gmail.com))

## Nils Bourland

(Royal Museum for Central Africa (RMCA), Service of Wood Biology, Tervuren, Belgium – [nilsbourland@gmail.com](mailto:nilsbourland@gmail.com))

## Isaac Ahanamungu Makelele

(Université Officielle de Bukavu, Department of Biology, Bukavu, Democratic Republic of the Congo; Université Officielle de Bukavu, Centre de Recherche en Ecologie et Gestion des Ecosystèmes Terrestre, Bukavu, Democratic Republic of the Congo – [isaacmakelele1@gmail.com](mailto:isaacmakelele1@gmail.com))

## Déborah Waluvera Kahindo

(Wood laboratory of Yangambi, Institut National pour l'Étude et la Recherche Agronomiques (INERA/Yangambi), Democratic Republic of the Congo; Université de Kisangani, Faculty of Renewable Resources, Department of Agricultural Sciences, Kisangani, Democratic Republic of the Congo; Université Catholique du Graben, Faculty of Agricultural Sciences, Department of Water and Forest, Butembo, Democratic Republic of the Congo – [debowalu@gmail.com](mailto:debowalu@gmail.com))

## Jean-Pierre Mate Mweru

(Ecole Régional Post-Universitaire d'Aménagement et de gestion Intégrés des Forêts et territoires Tropicaux, Kinshasa, Democratic Republic of the Congo; Université de Kinshasa, Faculté Des Sciences et Technologies, Department of Biology, Kinshasa, Democratic Republic of the Congo – [jpmatemweru@gmail.com](mailto:jpmatemweru@gmail.com))

## Jean-Remis Makana

(Université de Kisangani, Faculty of Science, Kisangani, Democratic Republic of the Congo – [jeanremymakana@gmail.com](mailto:jeanremymakana@gmail.com))

## Wannes Hubau

(Wood laboratory of Yangambi, Institut National pour l'Étude et la Recherche Agronomiques (INERA/Yangambi), Democratic Republic of the Congo; Royal Museum for Central Africa (RMCA), Service of Wood Biology, Tervuren, Belgium; Gent University, Faculty of Bioscience Engineering, Department of Environment, Laboratory of Wood Technology (UGent-Woodlab), Gent, Belgium – [Wannes.Hubau@ugent.be](mailto:Wannes.Hubau@ugent.be))

The Congo Basin forests face increasing threats, primarily from shifting cultivation practices involving slash-and-burn techniques. With Africa's population expected to rise sharply in the coming decades, these pressures are likely to intensify. In this context, understanding forest regeneration processes following agricultural abandonment (particularly in terms of floristic diversity and carbon stock recovery) represents a crucial ecological and applied research challenge.

This study investigated the dynamics of floristic diversity and assessed the trajectory of aboveground carbon stock recovery. Twenty permanent 50 m × 50 m plots were established in Mukumari (Sankuru Province, Democratic Republic of Congo) along a chronosequence of 5, 10, 20, and 60 years after abandonment, as well as in an old-growth forest (OG) used as a reference. Structural attributes, including quadratic mean diameter, Lorey's height, Gini coef-

ficient, and aboveground biomass, were measured, while floristic diversity was evaluated using Shannon, Simpson, Pielou, Fisher's alpha, and rarefaction indices.

A total of 2,309 individuals from 135 genera and 41 families were recorded. Structural attributes revealed a clear successional trajectory with stand age. Floristic diversity recovered relatively rapidly, with diversity indices showing a marked increase in species richness within the first decades of succession. However, aboveground carbon recovery was considerably slower, primarily due to the scarcity of large trees in regenerating forests, which play a critical role in the carbon storage of old-growth forests.

These findings highlight the rapid recovery potential of floristic diversity after agricultural abandonment, contrasted with the slower regeneration of carbon stocks. Protecting old-growth forests while promoting natural succession emerges as a cost-effective, long-term strategy for ecological restoration.

#### **Keywords**

Secondary succession, Floristic diversity, Carbon stock recovery, Natural regeneration, Sankuru

# Traditional plant knowledge as a reservoir of resilience to address climate change challenges in Karamoja, Northeast Uganda

**Emiel De Meyer**

(Botany Department, Staatliches Museum für Naturkunde Karlsruhe, Germany; Department of Plants and Crops, Faculty of Bioscience Engineering, Ghent University, Belgium – [emiel.demeyer@ugent.be](mailto:emiel.demeyer@ugent.be))

Intact mobile pastoralist systems support biodiversity conservation like no other food production system. For pastoralist communities, knowledge of this biodiversity is crucial for ensuring food security, healthcare, and informed decision-making in navigating the landscape. Yet, threats to these socio-ecosystems such as climate change and mobility restrictions increasingly endanger the preservation and transmission of this knowledge, thereby weakening both ecological and cultural resilience. Given that pastoralists heavily rely on plant biodiversity and its associated knowledge for survival, the ongoing erosion of these resources could push already fragile societies to the brink of collapse.

This study explores the role of traditional plant knowledge in climate change adaptation among the Karimojong and Tepeth agro-pastoralists in the Moroto District of Uganda's Karamoja region, a landscape characterized by high ecosystem integrity and a rich yet underdocumented biocultural heritage. It examines how livelihood disruptions shape pastoralists' ability to use traditional knowledge to adapt to changing climatic conditions.

This presentation shares preliminary insights from ongoing research. Early results indicate that traditional knowledge is being actively adapted to the changing realities faced by the Karimojong and plays a crucial role in their climate adaptation strategies. The Karimojong case provides a globally relevant example, illustrating the interconnectedness of food production, biodiversity conservation, and adaptive resilience in pastoralist systems facing contemporary environmental challenges. Findings will inform biodiversity conservation and pastoralist policy by emphasizing the integration of biocultural heritage into climate adaptation frameworks.

## Keywords

Pastoralism, Traditional knowledge, Climate change adaptation, Karamoja, Ethnobiology

# Security governance in cobalt mining in Haut-Katanga and Lualaba, DRC: Actors, tensions, and resistance

Espérant Mwishamali Lukobo

(Department of Criminology, Ghent University, Belgium – [Esperant.MwishamaliLukobo@UGent.be](mailto:Esperant.MwishamaliLukobo@UGent.be))

The mining sector in the Lualaba and Haut-Katanga provinces of the Democratic Republic of Congo (DRC) constitutes a major economic pillar but also a focal point of security tensions, governance conflicts, and resource-based rivalries. This study analyzes the dynamics of security governance in these provinces, focusing on interactions among state actors, private security forces, mining multinationals, artisanal miners, and local communities. Drawing on the theoretical framework of *nodal governance*—which posits a dispersion of authority and regulatory functions among multiple interconnected actors or “nodes” (Shearing & Wood, 2003; Dupont, 2004; Janssens, 2015)—the research explores how these actors, with divergent interests and capacities, negotiate, contest, and resist security arrangements in mining areas.

Historically marked by colonial exploitation and weak post-independence state management, contemporary mining governance in the DRC is characterized by institutional fragmentation, extensive privatization, and limited regulatory enforcement. The decline of Gécamines (the state mining company) and the liberalization of the sector through the 2002 and 2018 Mining Codes have intensified competition over resource access. These dynamics have led to recurrent clashes between industrial operators and artisanal miners, the militarization of corporate security, and widespread human rights violations. This study examines the emergence of these conflicts, the co-production of security by multiple nodes (state, private, and community), and the shortcomings of existing governance mechanisms in preventing violence. Corporate security forces and state authorities often collaborate to protect industrial concessions, while artisanal miners and local communities resist their exclusion through informal—and sometimes violent—means.

This research contributes to security studies by offering a critical perspective on pluralistic policing within a strategic resource context. It challenges the notion of collaborative governance by demonstrating how conflictual interactions between nodes undermine coordination and accountability. Although data collection is still forthcoming, the compilation of reported security incidents from diverse sources already fuels ongoing debates on mining regulation, corporate responsibility, and community rights in resource-rich yet conflict-prone regions. By linking forthcoming empirical findings from the DRC to theoretical debates on nodal governance, this study highlights the complex interconnections between contested resource governance, security, and resistance on Africa's mining frontiers.

## Keywords

Cobalt Mining Governance, State-Corporate Security Governance, DR Congo, Plural Policing, Conflicts

# From the BantUGent Corpus to Kirundi on Google Translate: Mutualization made real

## Ferdinand Mberamihigo

(Université du Burundi, Bujumbura, Burundi; Centre de recherche en Langues, Cultures et Sociétés (CRELACS), Burundi; Associate member of BantUGent-UGent Centre for Bantu Studies, Ghent University, Belgium – [fmbaramihigo@gmail.com](mailto:fmbaramihigo@gmail.com))

This presentation describes how collaboration between Ghent University (UGent) and the University of Burundi has enabled the development of a project to include Kirundi among the languages supported by Google Translate—an initiative that is currently ongoing. The origins of this project, which is crucial for enabling automatic translation to and from Kirundi, lie in a doctoral dissertation conducted at Ghent University within BantUGent, the UGent Centre for Bantu Studies.

The dissertation, titled *L'expression de la modalité en kirundi. Exploitation d'un corpus électronique*, was authored by Ferdinand Mberamihigo, who now serves as the project's technical coordinator for Google Translate. Under the supervision of Gilles-Maurice de Schryver and Koen Bostoen, he was introduced to corpus linguistics and compiled a Kirundi corpus as the basis for his linguistic analyses. At the time, the corpus contained 1.9 million tokens; by 2018, it had expanded to 3.5 million tokens and became part of the broader BantUGent Corpus.

The methodology developed during this doctoral research now underpins the ongoing effort to integrate Kirundi into Google Translate. Currently, parallel sentence lists are being compiled to train the translation system to recognize Kirundi for machine translation. Although the original corpus was not parallel, segments that contained parallel versions were preserved for later use and are now being incorporated. Additional parallel texts are being added to further strengthen the dataset for the Kirundi project.

The presentation outlines the steps taken, the progress achieved, and the anticipated outcomes. It highlights how the project builds on the scientific resources and expertise developed during the doctoral research at Ghent University. The inclusion of Kirundi on Google Translate represents an important milestone for African languages, which continue to face the challenge of establishing their presence on the web and in natural language processing technologies. This process of resource mutualization is ongoing, with the next objective being the collaborative creation of a monolingual Kirundi dictionary based on the same corpus resources.

## Keywords

Corpus linguistics, BantUGent, Google Translate, Parallel corpus, Machine translation

## References

- Mberamihigo, Ferdinand. 2014. *L'expression de la modalité en kirundi. Exploitation d'un corpus électronique*. Bruxelles/Gand: Université libre de Bruxelles (ULB), Université de Gand (UGent) PhD dissertation.
- Van der Veken, Anneleen & de Schryver, Gilles-Maurice. 2003. Les langues africaines sur la Toile. Étude des cas haoussa, somali, lingala et isixhosa. *Cahiers du RIFAL* 23, pp. 33-45.



# Building on the back of nature: Assessing the environmental cost of aggregate mining in eastern DR Congo

## Franck Mugisho Zahinda

(ECOSPHERE, Department of Biology, University of Antwerp, Belgium; Centre d'Expertise en Gestion Minière (CEGEMI), Université Catholique de Bukavu, DR Congo – [franck.mugisho@uantwerpen.be](mailto:franck.mugisho@uantwerpen.be))

## Bossissi Nkuba

(Institute of Development Policy (IOB), University of Antwerp, Belgium; Centre d'Expertise en Gestion Minière (CEGEMI), Université Catholique de Bukavu, DR Congo – [bossissi.nkuba@uantwerpen.be](mailto:bossissi.nkuba@uantwerpen.be))

## Sara Geenen

(Institute of Development Policy (IOB), University of Antwerp, Belgium; Centre d'Expertise en Gestion Minière (CEGEMI), Université Catholique de Bukavu, DR Congo – [sara.geenen@uantwerpen.be](mailto:sara.geenen@uantwerpen.be))

## Lieven Bervoets

(ECOSPHERE, Department of Biology, University of Antwerp, Belgium – [lieven.bervoets@uantwerpen.be](mailto:lieven.bervoets@uantwerpen.be))

Africa's mineral wealth has long attracted international attention. Much of the discussion has focused on export-oriented resources such as cobalt, lithium, and gold. Far less visible—but equally vital—are the construction minerals that underpin urban growth: sand, stone, clay, and other building materials. These materials rarely appear in global debates on raw materials, even though they sustain the daily realities of Africa's rapidly expanding cities.

Their extraction supports local employment and housing supply but also leaves lasting impacts on landscapes, ecosystems, and the climate. Across sub-Saharan Africa, accelerating urbanization fuels the growing demand for construction materials, accompanied by significant environmental costs

This study was conducted in Bukavu and Goma, two mid-sized cities in eastern Democratic Republic of Congo that illustrate both the environmental consequences of unplanned urbanization and the urgent need for sustainable development. Drawing on building footprint data, field interviews, and a life cycle assessment of locally sourced materials, we traced the environmental impacts of urban construction from extraction to material use.

Results show that the combined city-scale consumption of construction materials in Bukavu and Goma has generated an estimated 4.7 million tons of CO<sub>2</sub>-equivalent emissions based on current building stock—exceeding levels observed in many similarly sized cities in lower-income regions. While a minority of stakeholders acknowledge the environmental consequences of aggregate extraction, most overlook them given the sector's critical role in providing local employment and driving economic activity. Weak institutional capacity and persistent political instability further constrain the enforcement of environmental policies governing urbanization and resource extraction.

Addressing these challenges requires participatory planning in both the mining and construction sectors, alongside the promotion of sustainable building techniques. Situating Bukavu and Goma within broader regional urbanization trends underscores the pressing need to integrate construction materials into wider debates on sustainable cities, climate policy, and resource governance.

### Keywords

Construction material, Environmental impact, Climate, Urbanization, Governance

# Risk attitudes and preferences for solar-powered irrigation among rice farmers in northern Nigeria

**Funminiye Peter Oyawole**

(Department of Agricultural Economics and Agribusiness, University of Ghana, Legon, Ghana; Department of Agricultural Economics and Farm Management, Federal University of Agriculture, Abeokuta, Nigeria – [fpoyawole@st.ug.edu.gh](mailto:fpoyawole@st.ug.edu.gh))

**Mensah-Bonsu, A.**

(Department of Agricultural Economics and Agribusiness, University of Ghana, Legon, Ghana)

**Jatoo, J.D.**

(Department of Agricultural Economics and Agribusiness, University of Ghana, Legon, Ghana)

**Adaku, A.A.**

(Department of Agricultural Economics and Agribusiness, University of Ghana, Legon, Ghana)

**Cerjak, M.**

(Department of Marketing and Innovation in Agribusiness, University of Zagreb, Croatia)

Solar energy is the most abundant renewable energy source globally, making it a key alternative in the ongoing transition away from fossil fuels. Solar-powered irrigation (SPI) has emerged as an economically and environmentally sustainable solution for water abstraction and conveyance, particularly in sub-Saharan African (SSA) countries such as Nigeria, where most farmers lack access to electricity and rely on manual or fossil fuel-powered pumps. While the technical suitability of SPI in Nigeria has been demonstrated, there remains a notable gap in understanding farmers' preferences for adopting the technology. Moreover, understanding farmers' risk attitudes is crucial for predicting their economic behaviour and has become a key factor in analysing agricultural technology adoption.

This study examines the influence of risk attitudes on rice farmers' preferences for solar-powered irrigation in northern Nigeria. Using primary data collected from 432 rice farmers in Kano and Jigawa States, the study elicited farmers' preferences for SPI and their risk attitudes through a Discrete Choice Experiment (DCE) and a Multiple Price List (MPL) risk experiment, respectively. Data were analysed using descriptive statistics and Random Parameter Logit (RPL) models.

Results show that most farmers (67.7%) were risk-averse, with an average Constant Relative Risk Aversion (CRRA) coefficient of 0.12. The RPL estimates indicate that the Alternative Specific Constant (ASC) was negative and significant, reflecting a general preference for adopting SPI over the status quo. As expected, cost had a negative and significant effect, indicating farmers' sensitivity to pricing. Farmers also showed strong preferences for mobile SPI systems, individual ownership, high pump capacity (3 HP), and flexible financing arrangements allowing 50% upfront payment with the balance spread over five years.

However, when interactions with risk attitudes were included, risk-averse farmers preferred lower-capacity pumps (1.5 HP), favoured group ownership models, displayed stronger negative reactions to cost, and were less likely to adopt SPI over the status quo. These findings provide important insights into the heterogeneous nature of farmers' risk attitudes and how these influence SPI adoption decisions.

Based on these results, the study recommends developing mobile, high-capacity (3 HP) SPI systems that can be relocated across different plots, aligning with the realities of smallholder land fragmentation in SSA. Given the high upfront costs of SPI, flexible financing schemes with extended repayment periods should be introduced to encourage adoption. Additionally, group ownership through cooperative arrangements can reduce individual financial burdens, particularly for risk-averse farmers. Finally, targeted government and donor subsidies are needed to address farmers' price sensitivity and facilitate broader SPI uptake.

## Keywords

Solar-powered irrigation, Risk attitudes, Discrete choice experiment, Technology adoption, Smallholder farmers

# Entrepreneuriat foncier et urbanisation rapide à Lubumbashi : Étude de cas des quartiers Kyaluwaya et Maisha

**Guy Masudi Mwana Mulenda**

(Architecture Faculty, University of Hasselt, Belgium; Architecture Faculty, Université de Lubumbashi, D.R. Congo – [guy.masudi@uhasselt.be](mailto:guy.masudi@uhasselt.be))

**Oswald Devisch**

(Architecture Faculty, University of Hasselt, Belgium)

**Liesbeth Huybrechts**

(Architecture Faculty, University of Hasselt, Belgium)

**Regina John**

(School of Architecture, Ardhi University, Dar es Salam, Tanzania)

**César Khonde**

(Architecture Faculty, Université de Lubumbashi, D.R. Congo)

**Bonaventure Banza wa Banza**

(Architecture Faculty, Université de Lubumbashi, D.R. Congo)

Face à une croissance démographique accélérée, la ville de Lubumbashi connaît une expansion urbaine rapide, notamment dans ses quartiers périphériques. Cette dynamique exerce une forte pression sur le foncier et favorise l'émergence de pratiques d'entrepreneuriat foncier qui transforment profondément les modes d'accès et de gestion des terres.

Cette étude analyse l'interaction entre l'entrepreneuriat foncier et les processus d'urbanisation à Lubumbashi, à travers deux quartiers périphériques : Maisha et Kyaluwaya. En mobilisant une approche méthodologique mixte (combinant questionnaires structurés, entretiens semi-directifs, observation directe et cartographie participative) la recherche met en évidence une pluralité d'acteurs fonciers (traditionnels, formels et informels) dont les interventions imbriquées engendrent une fragmentation institutionnelle et une insécurité juridique croissante.

Les résultats révèlent la prédominance des autorités coutumières (50,69 %) dans l'attribution des terres avant la municipalisation, progressivement remplacées par des intermédiaires informels tels que les courtiers (41,78 %). Les conflits fonciers, notamment les doubles attributions (19,18 %), les litiges de limites et les différends successoraux non résolus, demeurent fréquents, tandis que les titres fonciers formels restent quasi inexistantes (0,68 %).

L'étude montre que l'urbanisation rapide reconfigure la gouvernance foncière locale et engendre un marché foncier hybride et faiblement régulé. Elle appelle à un renouvellement des politiques publiques intégrant les normes coutumières aux cadres institutionnels formels, afin de promouvoir un développement urbain plus inclusif, cohérent et durable.

## Mots-clés

Urbanisation rapide, Entrepreneuriat foncier, Conflits fonciers, Gouvernance hybride, Lubumbashi, Maisha, Kyaluwaya

# Aligning extractive industries with the SDGs: Evaluating environmental protection practices of mining companies in Tanzania

---

**Hanifa T. Massawe**

(Faculty of Law, Mzumbe University, Morogoro, Tanzania & Advocate of the High Court of Tanzania and Subordinate Courts thereto – [hmassawe@mzumbe.ac.tz](mailto:hmassawe@mzumbe.ac.tz))

Despite the growing importance of environmental protection globally, comprehensive assessments of how mining companies in Tanzania operationalize and implement environmental laws and regulations in the context of the UN Sustainable Development Goals (SDGs) remain limited. While Tanzania has made significant strides in mainstreaming the SDGs into national development plans and regulatory frameworks, challenges persist in monitoring enforcement across different sectors, including mining.

This paper evaluates how Tanzanian mining companies align with the UN Sustainable Development Goals, focusing on environmental protection (SDG 13 and SDG 15) within the country's broader drive for sustainable resource extraction. The study draws on national laws, regulatory frameworks, corporate practices, and case studies from northwestern Tanzania to examine gaps and opportunities in implementing environmental standards.

Although the SDGs have been integrated into policy and legal instruments, monitoring and enforcement challenges remain, particularly regarding corporate accountability in the mining sector. Using qualitative documentary review and targeted case studies, the research assesses mining companies' environmental compliance, practical measures, and corporate strategies. Triangulation of data from reports, policies, and stakeholder interviews highlights patterns, gaps, and best practices in operationalizing environmental SDG targets. The findings inform recommendations to strengthen corporate and regulatory responses, providing targeted insights for stakeholders engaged in extractives and sustainable development policy.

## **Keywords**

Environmental Protection, Mining Sector, SDGs, Corporate Accountability, Tanzania

# Whose language? Whose justice?

## Colonial legacies in Africa

**Happyness Nokwatu Raselabe**

(University of the Western Cape, South Africa – [Happynesskarabo36@gmail.com](mailto:Happynesskarabo36@gmail.com))

The role of colonial languages in postcolonial African countries remains a complex and contested issue, particularly in relation to justice, education, healthcare, socio-economic development, and cultural identity. In South Africa, English and Afrikaans—languages of former colonial and apartheid regimes—continue to dominate key institutions, as is the case in many African countries. This raises a central paradox: can the languages of former oppressors genuinely serve as tools for justice and socio-economic liberation in a multilingual and multicultural society seeking decolonization and equity?

Zimbabwean scholar Chimhundu (1998:63) questions the effectiveness of democracy and development in Africa when citizens cannot fully understand or engage with laws, education, or information due to language barriers. He argues that without proficiency in the language of governance and law, people cannot participate meaningfully in society or reach their full potential, highlighting the critical role of indigenous languages in national development.

Proponents of maintaining colonial languages contend that they provide access to global markets, higher education, and international discourse, making them practical tools for development. English, for example, has become the lingua franca in business, government, and the judiciary across much of Africa. However, this comes at a cost: fluency in colonial languages often determines access to justice, education, and opportunities, effectively marginalizing speakers of indigenous languages and limiting access to vital information and rights.

This situation fosters a two-tiered system. Firstly, language acts as a gatekeeper to opportunity and power. Secondly, it undermines African languages, perpetuating the myth that they are inadequate for legal, intellectual, or economic use. The argument is not for rejecting colonial languages but for reimagining multilingualism and linguistic justice, calling for meaningful investment in the development and institutional support of indigenous languages and African knowledge systems to ensure true inclusivity and empowerment, in line with the South African constitution.

### Keywords

African languages, Justice versus law, multilingualism, decolonisation, Indigenous knowledge systems.

# Diverse causes of extreme rainfall in November 2023 over equatorial Africa

**Hermann N. Nana**

(Laboratory for Environmental Modelling and Atmospheric Physics (LEMAP), Physics Department, University of Yaounde 1, Yaounde, Cameroon – [nanahermann100@yahoo.com](mailto:nanahermann100@yahoo.com))

**Masilin Gudoshava**

(IGAD Climate Prediction and Applications Centre (ICPAC), Nairobi, Kenya)

**Roméo S. Tanessong**

(Department of Meteorology and Climatology; Higher Institute of Agriculture, Forestry, Water and Environment; University of Ebolowa, Ebolowa, Cameroon; Laboratory for Environmental Modelling and Atmospheric Physics (LEMAP), Physics Department, University of Yaounde 1, Yaounde, Cameroon)

**Alain T. Tamoffo**

(Climate Service Center Germany (GERICS), Helmholtz-Zentrum Hereon, Hamburg, Germany)

**Derbetini A. Vondou**

(Laboratory for Environmental Modelling and Atmospheric Physics (LEMAP), Physics Department, University of Yaounde 1, Yaounde, Cameroon)

Understanding the atmospheric factors that lead to extreme rainfall events is essential for improving climate forecasting. This study aims to diagnose the physical processes underlying the extreme rainfall event of November 2023 in Equatorial Africa (EA), using the ERA5 reanalysis dataset. Composite, spatio-temporal, and correlation analyses were employed to elucidate the relationship between the November 2023 extreme precipitation events and various associated atmospheric and oceanic factors.

The analysis reveals that these extreme rainfall events were primarily influenced by multiple factors occurring simultaneously in the Pacific, Atlantic, and Indian Oceans. Key drivers included strong sea surface temperature (SST) anomalies in the Niño-3.4, North Tropical Atlantic, Equatorial Atlantic, and Indian Ocean Dipole (IOD) regions, as well as changes in zonal winds, the Walker circulation, anomalous moisture flux and its divergence, easterly jets, and the activity of the Madden-Julian Oscillation (MJO). The convergence of these moisture flows entered the EA region through its western and eastern boundaries, originating from the equatorial Atlantic and Indian Oceans, respectively.

The interplay of these factors produced strong positive rainfall anomalies in EA, with the highest totals recorded over southern Ethiopia, Somalia, Kenya, and Tanzania, exceeding 430 mm during the month. These findings highlight the need to consider multiple dynamic atmospheric processes jointly to anticipate such extreme events. The study contributes to the improvement of sub-seasonal to seasonal rainfall forecasts, supporting national meteorological services in enhancing the resilience of local populations to extreme weather conditions.

## Keywords

Equatorial Africa, IOD, Atmospheric circulation, SST, Rainfall variability

# Ethnobotanical survey of medicinal plants used by communities on the fringes of Budongo Central Forest Reserve, Uganda

**Ivan Kahwa**

(Department of Pharmacy, Faculty of Medicine, Mbarara University of Science and Technology, Mbarara, Uganda; Pharm-Biotechnology and Traditional Medicine Center, Mbarara University of Science and Technology, Mbarara, Uganda – [kahwa@must.ac.ug](mailto:kahwa@must.ac.ug))

**Timothy Omara**

(Department of Chemistry, College of Natural Sciences, Makerere University, Uganda)

**Mercy Agaba**

(Department of Plant Sciences, Microbiology & Biotechnology, College of Natural Sciences, Makerere University, Kampala, Uganda)

**Upton Nuwagira, Clement O. Ajayi**

(Department of Pharmacy, Faculty of Medicine, Mbarara University of Science and Technology, Mbarara, Uganda; Pharm-Biotechnology and Traditional Medicine Center, Mbarara University of Science and Technology, Mbarara, Uganda)

**Introduction:** The resurgence of interest in traditional medicine, amid growing antimicrobial resistance, underscores the need to document and preserve indigenous ethnobotanical knowledge. Budongo Forest Reserve in western Uganda is a biodiversity hotspot, with surrounding communities whose traditional medicinal practices remain underexplored.

**Aim:** This study aimed to document medicinal plants used by communities around Budongo Forest and their associated ethnomedicinal practices.

**Materials & Methods:** A cross-sectional ethnobotanical survey was conducted in December 2023 among 25 respondents selected via snowball and purposive sampling. Data were collected using semi-structured questionnaires and open interviews, focusing on plant use, preparation methods, and disease treatment. Voucher specimens were identified and authenticated. Data were analysed using descriptive statistics, citation frequency, and preference ranking.

**Results:** Seventy medicinal plant species, belonging to 34 families and 66 genera, were documented for the treatment of 43 health conditions. Dominant families included Asteraceae (15.7%) and Fabaceae (8.6%). The most cited species were *Erythrina abyssinica*, *Agapanthus africanus*, and *Hoslundia opposita*, used to manage syphilis, ulcers, erectile dysfunction, and malaria. Leaves (56.2%) were the most commonly used plant parts, with remedies prepared primarily by squeezing (34.7%), decoction (31.9%), or infusion (22.2%), and administered mainly orally (70.3%).

**Conclusion:** Communities around Budongo Forest Reserve possess rich ethnomedicinal knowledge and rely heavily on native flora. Certain species' high citation and preference scores underscore their cultural and therapeutic importance. Bioactivity-guided research is recommended to validate the therapeutic claims, particularly for under-investigated species with high local use values.

## Keywords

Ethnobotany, Traditional medicine, Medicinal plants, Budongo Forest, Uganda



# On *Jerabos* and *Kpo-Fire*: Extraction, infrastructural violence, and resistance on the Zambian Copperbelt and the Niger Delta

**Jackson Tamunosaki Jack**

(University of Groningen, The Netherlands – [j.t.jack@rug.nl](mailto:j.t.jack@rug.nl))

**Jabulani Shaba**

(University of Groningen, The Netherlands – [j.shaba@rug.nl](mailto:j.shaba@rug.nl))

**Iva Peša**

(University of Groningen, The Netherlands – [i.pesa@rug.nl](mailto:i.pesa@rug.nl))

Global extraction of oil and mineral resources has generated diverse forms of extractive and infrastructural violence in Africa, exemplifying David Harvey's concept of "accumulation by dispossession," which highlights how capitalist extractivism displaces local communities from their land, natural resources, and well-being. This paper draws on ethnographic, archival, and photographic data from gold mine dumps in the Black Mountain of Mufulira on the Zambian Copperbelt and oil pipelines in the Niger Delta, examining these sites as loci of extractive and infrastructural violence.

Shifting from scholarship that primarily addresses the impacts of extractive infrastructures and capitalist violence, this paper employs multiple case studies to analyze the politics of resistance within extractive geographies. The study demonstrates that communities, as a response to extractive violence and historical dispossession, often reclaim and 'legitimize' local natural resources through artisanal mining practices. By framing artisanal mining as a form of resistance to global capitalist extractivism, this paper contributes to broader debates on extractive resistance and the socio-political dynamics of resource governance in Africa.

## Keywords

Extraction, Infrastructure, Violence, Resistance, Niger Delta, Zambia

# The Diamond Floors of Rooifontein: Towards an environmental history of a post-industrial diamond mining site in Kimberley, South Africa

---

**Jan-Bart Gewald**

(African Studies Centre, Leiden University, The Netherlands – [J.b.gewald@asc.leidenuniv.nl](mailto:J.b.gewald@asc.leidenuniv.nl))

The richest diamond deposits ever discovered were found by chance under a Camelthorn tree on a small hillock in South Africa in 1871, triggering the rapid development of Kimberley. The city later became the seat of De Beers Consolidated Diamond Mines, underpinning the economic and political power of Cecil John Rhodes, who by 1890 controlled approximately 90% of the world's diamond production.

A map of Kimberley and its surroundings from 1892 depicts the “Diamond Floors” surrounding the mines, and in one case, abandoned floors became the site of the Rooifontein Wildlife Reserve. Today, Rooifontein serves as a physical buffer zone around the diamond processing area of Ekapa Diamond Mining Company.

This paper employs an experimental historical methodology, combining archival materials, oral histories, photographs, and “walking the land”—literally traversing the landscape to observe and document its historical transformation. Features such as rubbish tips, trolley rails, exotic trees, artillery shells, and company bricks reveal the industrial past of Rooifontein. By tracing these material traces, the paper uncovers hidden histories of industrial diamond mining in Kimberley, highlighting the environmental and cultural legacies of this post-industrial landscape.

## **Keywords**

Diamonds, Mining, Multi-species history, South Africa, Heritage

# Quantifying carbon emissions and their impact on mitigation intervention implementation in identified healthcare facilities hotspots: Case studies from Kenya, Zimbabwe, and South Africa

**Jetina Tsvaki**

(Centre for Sexual Health and HIV AIDS Research Zimbabwe (CeSHHAR), Zimbabwe – [jetinaj.tsvaki@ceshhar.org](mailto:jetinaj.tsvaki@ceshhar.org))

**Thabani Muronzie**

(Centre for Sexual Health and HIV AIDS Research Zimbabwe (CeSHHAR), Zimbabwe – [Thabani.Muronzie@ceshhar.org](mailto:Thabani.Muronzie@ceshhar.org))

**Josh Rusike**

(Centre for Sexual Health and HIV AIDS Research Zimbabwe (CeSHHAR), Zimbabwe – [Joshpanashe3@gmail.com](mailto:Joshpanashe3@gmail.com))

**Tapiwa Nyakabau**

(Centre for Sexual Health and HIV AIDS Research Zimbabwe (CeSHHAR), Zimbabwe – [tapiwa.nyakabau@ceshhar.org](mailto:tapiwa.nyakabau@ceshhar.org))

**Fortunate Machingura**

(Centre for Sexual Health and HIV AIDS Research Zimbabwe (CeSHHAR), Zimbabwe – [fortunate.machingura@ceshhar.org](mailto:fortunate.machingura@ceshhar.org))

**Jean Le Roux**

(Wits RHI, South Africa – [jleroux@wrhi.ac.za](mailto:jleroux@wrhi.ac.za))

**Celeste Madondo**

(Wits RHI, South Africa – [cmadondo@wrhi.ac.za](mailto:cmadondo@wrhi.ac.za))

**Shobna Sawry**

(Wits RHI, South Africa – [ssawry@wrhi.ac.za](mailto:ssawry@wrhi.ac.za))

**Aquinius Mung'atia**

(Aga Khan Health Services, Kenya – [aquinius.mungatia@akhkenya.org](mailto:aquinius.mungatia@akhkenya.org))

**Sohail Ally Baloch**

(Aga Khan Health Services, Kenya – [sohail.baloch@akhkenya.org](mailto:sohail.baloch@akhkenya.org))

**Zeenat Sulaiman**

(Aga Khan Health Services, Kenya – [zeenat.sulaiman@akhst.org](mailto:zeenat.sulaiman@akhst.org))

**Stanley Luchters**

(Centre for Sexual Health and HIV AIDS Research Zimbabwe (CeSHHAR), Zimbabwe; Liverpool School of Tropical Medicine, UK; Ghent University, Belgium – [stanley.luchters@ceshhar.org](mailto:stanley.luchters@ceshhar.org))

**Background:** The healthcare sector accounts for approximately 5% of global greenhouse gas emissions. Measuring carbon emissions in healthcare facilities is increasingly critical for addressing climate change, informing accountability, and guiding sustainable operations. Within the HIGH Horizons project, this study examines the cost-effectiveness of carbon mitigation interventions in selected healthcare facilities across Kenya, Zimbabwe, and South Africa, focusing on strategies that reduce environmental impact while maintaining operational efficiency.

**Methods:** Baseline carbon emissions were measured monthly using the Aga Khan Development Network (AKDN) Carbon Management Tool, capturing scope 1, 2, and 3 emissions from two private facilities in Kenya and six public facilities in South Africa and Zimbabwe. Following data collection, stakeholder engagement informed the design of context-specific mitigation interventions. Interventions were integrated into CARBOMICA, a resource-allocation tool that helps healthcare facilities in resource-limited settings select from a vetted pool of strategies. Implementation planning began in September 2024, and endline assessments to evaluate the effectiveness of tailored interventions are underway.

**Results:** Baseline data showed variability in emission sources and volumes. Scope 1 emissions—mainly from refrigerants, vehicle fuel, and liquid fuels—were high contributors across all sites. Scope 2 emissions, largely from grid electricity, were dominant in most facilities, while scope 3 emissions from business travel, waste, and inhalers were significant. Stakeholder engagement ensured interventions were feasible and aligned with national policies. In Kenya, interventions focused on energy-efficient lighting, solar adoption, improved waste management, and upgraded cooling systems. South African interventions emphasized electricity reduction and efficient on-site energy generation, while Zimbabwe prioritized cleaner energy transitions, waste management improvements, and energy efficiency measures.

**Conclusion:** Quantifying carbon emissions in healthcare facilities enables the development of “carbon-smart” interventions that mitigate the sector’s ecological footprint while maintaining or enhancing service quality. Context-specific strategies informed by robust emission data and stakeholder collaboration are essential for sustainable healthcare operations in sub-Saharan Africa.

#### Keywords

Carbon emissions, Low-carbon-healthcare, Mitigation interventions, Resource allocation, CARBOMICA

# Le séquençage armé à l'est du Congo : Scruter les acteurs armés dans les chaînes d'approvisionnement des ressources naturelles

---

Josaphat Musamba

(Ghent University, Belgium – [Josaphat.MusambaBussy@UGent.be](mailto:Josaphat.MusambaBussy@UGent.be))

Cet article introduit le concept de « séquençage armé » pour analyser les pratiques sécuritaires dans le secteur des ressources naturelles dans les États à sécurité fragile. Dans l'est de la RDC, les forces de défense et de sécurité loyalistes ainsi que les groupes armés non étatiques jouent un rôle central dans la régulation de la sécurité, notamment dans les activités minières. Au-delà de l'insécurisation, l'institution militaire (AFRIDEX) contribue à la formation et à la transmission de compétences spécialisées, tandis que la DMIAP lutte contre la fraude aux minerais. L'analyse montre que la politique de défense territoriale crée des zones d'exploitation où la présence armée est indispensable.

La collecte de données, réalisée selon la méthode dite « écureuil », met en évidence que, malgré leur exclusion par le code minier révisé de 2018, les forces armées étatiques restent essentielles pour sécuriser les exploitations artisanales, semi-industrielles et industrielles. Parallèlement, les groupes armés non étatiques participent également à la sécurisation des chaînes d'approvisionnement à travers leurs pratiques propres. Les études de cas menées à Djugu, Fizi, dans le Nord-Kivu et dans la chefferie des Bafuliru au Sud-Kivu illustrent la complexité des interactions entre ces acteurs dans le maintien de l'ordre et la régulation de l'accès aux ressources. Ces résultats soulignent la nécessité de repenser le rôle des forces de défense et de sécurité, étatiques et non étatiques, dans la gouvernance des chaînes d'approvisionnement des ressources naturelles en RDC.

# Mapping the construction minerals supply chains: Actors, power, and governance

**Joseph Bahati Mukulu**

(Institute of Development Policy, University of Antwerp, Belgium; CEGEMI, Université Catholique de Bukavu, DR Congo – [joseph.bahatimukulu@uantwerpen.be](mailto:joseph.bahatimukulu@uantwerpen.be))

Since the early 1990s, eastern Democratic Republic of the Congo (DRC) has experienced rapid urbanisation, particularly in Bukavu, driven by long-standing political and economic crises. This urban expansion has heightened demand for housing and, consequently, for construction minerals—also referred to as low-value minerals (LVM). While high-value mineral (HVM) value chains such as 3Ts, gold, and diamonds are well-studied in the DRC, research on LVM supply chains remains limited despite their growing contribution to global mining production.

This study employs a systematic mapping approach to analyse the governance of three construction mineral supply chains: gravel, sand, and clay bricks. The research identifies key actors, segments, and power relations underpinning these chains. Except for sand, which lacks a processing stage, all chains comprise extraction, processing, and sale segments. Stakeholders include landowners, managers, workers, and brokers, with brokers playing a pivotal role across chains. Gendered labour divisions persist: women occupy low-wage, insecure roles, often marginalised by men, while children's participation reflects the intergenerational transmission of skills. Actors frequently organise into associations or cooperatives to enhance bargaining power, and some operate across multiple chains.

The study demonstrates the sector's importance for local livelihoods but highlights persistent risks of discrimination and exploitation. By mapping actors, segments, and governance structures, this research provides a taxonomy of the construction minerals sector and calls for closer attention to social inequalities, labour dynamics, and the critical role of intermediaries in Bukavu's construction economy.

## Keywords

Development minerals, Local value chain, Bargaining power, Systematic mapping supply chain, Local labor control regime

# The Expropriation Without Compensation Act: Exposing the need for a paradigm shift

**Josephine Vaccaro**

(Universidad Complutense de Madrid, Spain – [accaro.josie@gmail.com](mailto:accaro.josie@gmail.com))

On 23 January 2025, the Expropriation Without Compensation Act was signed into law, reigniting debates over South Africa's "land question," particularly following the earlier failure to amend the constitution to allow expropriation without compensation. This paper contributes to the literature on land reform by critically examining the implications, effectiveness, and limitations of the Act.

The study begins with a historical overview of apartheid-era legislation that structured population and land along racial lines, highlighting land as a central instrument of social and spatial control. It then examines the current legal framework and the socio-economic realities underpinning contemporary land reform debates. The paper interrogates whether moral, social, and economic imperatives for justice remain adequately addressed nearly three decades into South Africa's democracy, and considers alternative approaches where the current provisions may fall short.

Arguing for a paradigm shift, the paper advocates moving from a metanarrative of "loss and restoration" toward a pragmatic, context-specific developmental framework, in line with academic and policy debates. This approach is illustrated through case studies based on primary sources, complemented by secondary literature and an interdisciplinary methodology. While the ultimate outcomes of the Act remain uncertain, this research underscores the importance of rethinking land reform strategies to align with contemporary social, economic, and developmental realities in South Africa. Given the recentness of the events, this paper speculates on alternatives to expropriation without compensation. Concerning the outcome, time will tell.

## Keywords

Africa, South Africa, Land question, Land reform, Expropriation without compensation



# Environmental Impact Assessment (EIAs) and socio-ecological safeguards: A critical review of EIAs in Uganda's Albertine oil exploration zone

---

## Juliet Musoke Nakabuye

(Faculty of Law and Criminology, Ghent University, Gent, Belgium; School of Arts and Social Sciences, Faculty of Business Administration, Uganda Martyrs University, Kampala, Uganda – [Juliet.NakabuyeMusoke@UGent.be](mailto:Juliet.NakabuyeMusoke@UGent.be))

## Bosco Bwambale

(Department of Agronomy and Natural Resources, Uganda Martyrs University, Kampala, Uganda; Environmental and Sustainability Studies, Thrive Scientific Research Institute (TRISU), THRAIF, Fort Portal, Uganda)

## Hendrik Schoukens

(Faculty of Law and Criminology, Ghent University, Gent, Belgium)

Environmental Impact Assessment (EIA) constitutes a globally recognized legal instrument to evaluate the environmental, social, and economic implications of development projects prior to approval. In Uganda, EIAs are mandated under the National Environment Act and regulated by the National Environment Management Authority (NEMA). Internationally, obligations under the Convention on Biological Diversity (CBD, 1993) and African regional protocols further reinforce the integration of EIAs into decision-making processes. Jurisprudence has elevated the importance of EIAs: the International Court of Justice, in *Pulp Mills on the River Uruguay* (2010), affirmed EIA as a requirement under customary international law, while the African Commission on Human and Peoples' Rights, in *Centre for Minority Rights Development (Endorois) v. Kenya* (2009), emphasized meaningful consultation and environmental safeguards for development projects affecting indigenous peoples.

Despite this framework, Uganda's Albertine Graben—an ecologically rich yet resource-intensive region—presents a critical case study. This research employs a doctrinal legal methodology to analyze Uganda's statutory provisions and international obligations, complemented by a socio-legal review of EIA reports and stakeholder interviews. Findings reveal persistent enforcement gaps, particularly regarding displacement, land rights, and the protection of vulnerable groups. The study concludes with recommendations to align Uganda's EIA practices with evolving international and regional jurisprudence, thereby ensuring substantive environmental justice.

## Keywords

Environmental Impact Assessment (EIA), Uganda, Albertine Graben, International and regional jurisprudence, Biodiversity and socio-ecological safeguards

# Diamond rush: Securitization and de-militarization debate of the diamond fields in Chiadzwa Community, Zimbabwe

**Knowledge Mwonzora**

(Centre for Security, Peace and Conflict Resolution and Centre for the Advancement of Non-racialism and Democracy at Nelson Mandela University, South Africa – [kmwonzora@gmail.com](mailto:kmwonzora@gmail.com))

In many African contexts characterized by weak governance, extractive sectors often become arenas of chaos and violence. The discovery of diamonds in the Chiadzwa community of eastern Zimbabwe in 2006 exemplifies this dynamic, sparking debates on securitization, displacement, and subsequent community relocation to the Odzi area. The diamond rush attracted illegal miners, syndicates, and buyers from neighboring countries and beyond.

This study critically examines the government's securitization of the Chiadzwa area through deployment of military, police, and state security agents to regulate illegal mining activities. It investigates the associated human rights abuses, including the loss of over 300 civilian lives, and situates these events within the broader nexus of political interests, violence, livelihoods, and the political economy of natural resources. By focusing on the Chiadzwa case, the paper engages with debates on the resource curse, the politicization of natural resources, state repression, and the impact of political elites' vested interests on peace and stability in mineral-rich communities.

The analysis employs Greed and Grievance theory to interpret triggers for securitization and to critically assess the argument that local populations should benefit from resources within their locality. Methodologically, the study relies on qualitative content analysis of existing sources, offering insights into the complex interplay between natural resource governance, human security, and political economy in Zimbabwe's diamond fields.

## **Keywords**

Securitization, Human rights abuse, Illegal panners, Diamonds, Natural resources

# Blood minerals and broken states: The politicisation of resource extraction in Africa's conflict zones

---

**Lukong Stella Shulika**

(IIE Varsity College, South Africa – [lukongshulika@gmail.com](mailto:lukongshulika@gmail.com))

**Anslem Wongibeh Adunimay**

(University of Johannesburg, South Africa)

Mineral resources in Africa have long been sites of both economic potential and violent contestation. This paper examines the politicisation of access to high-value minerals, specifically gold, diamonds, and coltan, and its role in entrenching conflict and undermining state authority in fragile African states. Through a comparative study of the Democratic Republic of Congo (DRC), Central African Republic (CAR), and South Sudan, the research unpacks how mineral wealth exacerbates political instability by reshaping power dynamics and governance structures at multiple levels. Using a political ecology framework, the study explores how elite appropriation, exclusionary governance structures, and entrenched informal economies surrounding mineral extraction intensify local grievances and perpetuate cycles of violence. Resource access is rarely neutral; it is deeply embedded in asymmetric power relations and often manipulated to serve the strategic interests of ruling elites and external actors. The paper highlights how control over resource sites becomes a mechanism of political dominance, fueling militarised competition and weakening national cohesion. It further examines the global dimensions of resource-based violence, showing how international demand for strategic and precious minerals sustains illicit extraction, empowering non-state armed groups while undermining formal institutions. By challenging the simplistic 'greed versus grievance' dichotomy, this paper offers a nuanced analysis of the interplay between natural wealth, political agency, and institutional erosion. It posits that mineral resources are not mere triggers of conflict but instruments through which political legitimacy is negotiated or undermined. Finally, the study underscores the urgency of rethinking mineral governance in conflict-affected contexts, highlighting the need to decouple resource wealth from violent patronage networks, strengthen institutional capacity, and address historical and geopolitical conditions that sustain resource-fuelled state fragility.

## Keywords

Mineral governance, Armed mobilisation, Political ecology, State fragility, Resource conflict

# AfCFTA's role in promoting sustainable intra-African timber trade for inclusive green growth

**Lydia Afriyie-Kraft**

(Centre for Development and Environment, University of Bern, Bern, Switzerland – [lydia.afriyie@unibe.ch](mailto:lydia.afriyie@unibe.ch))

**Marie Louise Avana**

(African Forest Forum, Nairobi, Kenya)

**Folaranmi Babalola**

(African Forest Forum, Nairobi, Kenya)

**Thomas Breu**

(African Forest Forum, Nairobi, Kenya)

**Daphine Gitonga**

(African Forest Forum, Nairobi, Kenya)

**Moussa Massaoudou**

(African Forest Forum, Nairobi, Kenya)

**Doris Mutta**

(African Forest Forum, Nairobi, Kenya)

**Labode Popoola**

(African Forest Forum, Nairobi, Kenya)

**Astrid Zabel**

(African Forest Forum, Nairobi, Kenya)

African timber producers face significant challenges in scaling up intra-African timber trade. Weak governance systems, limited processing infrastructure, excessive bureaucracy, and high tariffs hinder the expansion of trade within the continent. These challenges are further compounded by concerns that environmental trade policies, such as the EU Regulation on Deforestation-free Products (EUDR), may create inequalities and disadvantage producer countries. Moreover, tariffs and trade policies under the current US administration could generate trade tensions and disrupt global supply chains.

The African Continental Free Trade Area (AfCFTA), a trade agreement among 54 African countries, aims to encourage internal trade and facilitate the free movement of people. This study investigates the potential of the AfCFTA to promote sustainable intra-African timber trade and foster inclusive green growth. Data were collected through a 10-day series of focus group discussions, organized within a Community of Practice, engaging 146 stakeholders from the timber sector representing 24 African countries.

The study identifies key constraints and implementation barriers to the AfCFTA, including weak governance, policy and regulatory gaps, infrastructure deficiencies, limited capacities for value addition, restricted investment, and the marginalization of informal small and medium-sized enterprises (SMEs). It proposes strategies to leverage the AfCFTA for sustainable timber trade, including: (1) green-incentivized trade policies to stimulate sustainable investments; (2) development of underutilized or lesser-known timber species through innovative research; (3) effective dissemination of research findings and market promotion to relieve pressure on established species; (4) targeted training, capacity building, and support programs for informal SMEs to encourage formalization and inclusivity; and (5) strengthened regional cooperation and streamlined bureaucratic systems to implement effective, enforceable trade policies and regulatory reforms. These measures aim to unlock the AfCFTA's potential for environmentally sustainable and socially beneficial timber trade, contributing to inclusive green growth across Africa.

## Keywords

AfCFTA, Timber trade, Green growth, Intra-African trade, Africa

# The United Nations Development Programme's finance strategy for Greater Kruger of South Africa: Green extractivism disguised?

**Magdalena Sophie Fröhlich**

(Department of African Studies, University of Vienna, Vienna, Austria – [magdalena.froehlich@univie.ac.at](mailto:magdalena.froehlich@univie.ac.at))

**Chenai Murata**

(Department of African Studies, University of Vienna, Vienna, Austria – [chenai.murata@univie.ac.at](mailto:chenai.murata@univie.ac.at))

Leveraging the support of major financiers and global institutions, green investment has emerged as a key approach for achieving climate change adaptation and mitigation. However, it has recently faced criticism for promoting green extractivism, particularly when implemented in Global South communities that maintain asymmetrical power relations with investors.

This paper reviews the UNDP finance strategy for Greater Kruger in South Africa. Using a content analysis approach, it addresses the question: does the UNDP finance strategy for Greater Kruger constitute green extractivism in disguise? Drawing on Bruna's (2023) four criteria of green extractivism, we analyzed three of the seven financing themes (protected areas, biodiversity financing, and carbon financing) and found that all meet the criteria.

The finance strategy facilitates the appropriation of nature and capital accumulation for investors and landowners, who are generally wealthy white individuals, through tax incentives, carbon permits, and returns on investment, while local Black communities remain excluded. We argue that green investment projects per se are not inherently problematic, but caution must be exercised to ensure that they are implemented in ways sensitive to power relations and that promote inclusive conservation.

## Keywords

Green extractivism, Greater Kruger, South Africa, local communities, green investment

# Rethinking tales of the land and sea: Ecological epistemologies in Digo oral narratives, Kenya

**Mark Obure-Morang'a**

(Department of Language and Cultures, Ghent University, Belgium; Department of Literature, University of Nairobi, Kenya – [mark.oburemoranga@ugent.be](mailto:mark.oburemoranga@ugent.be))

**Peter Wasamba**

(Department of Literature, University of Nairobi, Kenya – [pwasamba@uonbi.ac.ke](mailto:pwasamba@uonbi.ac.ke))

This study, conducted through fieldwork in January, February, November, and December 2024 among the Digo community in Kenya, explores the role of oral narratives as literary productions that foster ecological consciousness within their cultural context. By examining four oral narratives from the Digo community, the research investigates how these stories address environmental themes and contribute to the community's ecological awareness.

Grounded in literature, this study adopts a multidisciplinary approach, incorporating insights from environmental studies, oral literature, and literary analysis. The core objectives include identifying ecological themes in Digo oral narratives, analyzing the narrative techniques used to convey environmental messages, and evaluating their impact on shaping ecological consciousness.

The findings reveal that the Digo have long revered their natural surroundings, as evidenced by their oral performances. Proverbs warn against cutting specific trees, poems praise bodies of water, riddles reference the local environment, and oral narratives pay tribute to the ecosystem. By scrutinizing the thematic concerns and narrative techniques in selected narratives, the study illuminates the ways in which Digo culture articulates the relationship between humans and the environment through oral performances.

The study concludes that Digo oral literature is more than entertainment; it is a living tradition that embodies the essence of the natural world, including plants, animals, and local customs. This research suggests that the preservation and revitalization of oral narratives are critical for ecological awareness and protection. Foreign interventions that disregard indigenous knowledge risk undermining conservation efforts. Therefore, continued engagement with Digo oral narratives is essential for understanding their potential to spur ecological consciousness and foster sustainable practices.

## Keywords

Oral literature, Fieldwork, Kwale County, Kenya, Eco-criticism

# Oil discovery in Namibia and public governance arrangements: Can Namibia avoid the resource curse?

**Mazarire Tichaona**

(North-West University, South Africa – [tichmazyezra@gmail.com](mailto:tichmazyezra@gmail.com))

**Phago Kedibone Phago**

(North-West University, South Africa – [Kedibone.Phago@nwu.ac.za](mailto:Kedibone.Phago@nwu.ac.za))

Namibia's independence from the South African apartheid regime was a pivotal moment in the country's history, ushering in black majority rule through the South West Africa Peoples Organisation (SWAPO) Party, which won the first democratic elections in 1990. SWAPO's 34-year rule has seen Namibia emerge as one of the most politically stable countries on the African continent, with significant strides made in the economic sector. The country's GDP has steadily increased from \$2.79 billion in 1990 to a peak of \$13.68 billion in 2018. This growth is unsurprising given the vast mineral and marine resources the country possesses, coupled with a population of only 3 million (2023 census).

Despite a small population and substantial income flowing into the treasury over the last three decades, Namibia remains the second most unequal country in the world, with a Gini index of 59.1 in 2023. This persistent inequality has been a challenge that the government has struggled to address. Consequently, the recent discovery of vast oil reserves off the Namibian coast in the Atlantic Ocean has been met with cautious optimism regarding its potential to improve the socio-economic circumstances of the economically vulnerable. According to the Multidimensional Poverty Index (2021), approximately 43% of the population is considered multidimensionally poor. Meanwhile, the national unemployment rate remains high at 21% (2023), rising to 47% among the youth.

These stark statistics contrast with the SWAPO Party-led government's resistance to introducing a universal basic income grant and other social safety net reforms. Given these realities, the question arises: can Namibia avoid the resource curse with its newfound oil wealth, considering the government's track record of resource management and wealth distribution over the past three decades? There is no guarantee that an increase in GDP will automatically translate into improved socio-economic conditions for the impoverished. Addressing this question requires a critical analysis of Namibia's public governance arrangements and the potential impact of the latest oil discoveries on the country's socio-economic outlook.

## Keywords

Namibia, Offshore oil discovery, Resource curse, Public governance, Socio-economic inequality



# The development and validation of a PhD competency framework in Ethiopia: A modified Delphi study

## Mieke Embo

(Ghent University, faculty of psychology and pedagogy, Department of Educational Sciences, Belgium; Artevelde University of Applied Sciences, Expertise Network Health and Care, Ghent, Belgium – [Mieke.embo@ugent.be](mailto:Mieke.embo@ugent.be) & [mieke.embo@arteveldehs.be](mailto:mieke.embo@arteveldehs.be))

## Hanna Getachew Amare

(Hawassa University, Department of social Anthropology, Hawassa, Ethiopia – [hannagetachew@hu.edu.et](mailto:hannagetachew@hu.edu.et))

## Bekalu Ferede

(Jimma University, College of Education and Behavioral Sciences, Department of Educational planning and Management, Jimma, Ethiopia – [bekalu.ferede@ju.edu.et](mailto:bekalu.ferede@ju.edu.et))

## Tibebu Alemu

(Ambo University, College of Natural and Computational Sciences, Department of Chemistry, Ambo, Ethiopia – [tibebu.alemu@ambou.edu.et](mailto:tibebu.alemu@ambou.edu.et))

## Kasahun Eba

(Jimma University, department of Environmental Health Sciences and Technology, Jimma, Ethiopia – [kasahunebako@yahoo.com](mailto:kasahunebako@yahoo.com))

## Taye Gebremariam

(Hawassa University, College of Social Sciences and Humanities, Department of English Language and Literature, Hawassa, Ethiopia – [tayegmaro@gmail.com](mailto:tayegmaro@gmail.com))

## Bersissa Kumsa

(Addis Ababa University, Department of Microbiology, Parasitology and Poultry Health, College of Veterinary Medicine and Agriculture, Bishoftu, Ethiopia – [bersissa.kumsa@aau.edu.et](mailto:bersissa.kumsa@aau.edu.et))

## Fiona Van de Velde

(Jimma University, College of Education and Behavioral Sciences, Department of Special Needs and Inclusive Education, Jimma, Ethiopia – [Fiona.VandeVelde@UGent.be](mailto:Fiona.VandeVelde@UGent.be))

## Teklu Gemechu Abessa

(Jimma University, College of Education and Behavioral Sciences, Department of Special Needs and Inclusive Education, Jimma, Ethiopia – [teklugem@yahoo.com](mailto:teklugem@yahoo.com))

## Bruno Levecke

(Jimma University, College of Education and Behavioral Sciences, Department of Special Needs and Inclusive Education, Jimma, Ethiopia – [Bruno.Levecke@UGent.be](mailto:Bruno.Levecke@UGent.be))

**Background:** Improving PhD education is a key pillar of Ethiopia's national strategy. Although the literature emphasizes the necessity of competency-based curricula, a framework describing the required competencies for PhD education is lacking in Ethiopia. This study aimed to address this gap by developing and validating a PhD competency framework tailored to Ethiopia's context.

**Methods:** A web-based modified Delphi study was conducted between December 2023 and 2024. Structured consensus ratings and qualitative feedback were carried out over five rounds, involving various stakeholders in PhD education (n=334). Consensus scores were calculated based on three criteria: (i) relevance, (ii) clarity, and (iii) com-

pleteness. Descriptive statistics were calculated, and thematic content analysis was used to analyze participants' qualitative comments.

**Findings:** A PhD competency framework comprising seven roles, sixteen competencies, and sixty behavioral indicators was developed. Most quantitative results met the 70% consensus threshold, except for the relevance of Competency 10 (Ongoing Learning, round 5), the clarity of Competency 1 (Broad Knowledge, rounds 1 and 4), and Competency 16 (Personal Wellbeing, round 5). Qualitative analysis identified seven themes providing insights into stakeholders' experiences: 1) framework adjustments, 2) assessment needs, 3) context, 4) implementation challenges, 5) diversity issues, 6) expectations of PhD students, and 7) underlying conditions. Numerous comments highlighted the importance of understanding the challenges faced by stakeholders in PhD education in Ethiopia.

**Conclusion:** The findings led to the development of a validated PhD competency framework, which serves as a foundation for improving the quality of PhD education in Ethiopia.

#### Keywords

Competency framework, Doctoral, PhD, Ethiopia, Consensus method

# Rethinking women's marginalization through ICBT in the Uganda-Congo borderland regions

**Naomi Nabami**

(Department of History, University of Antwerp, Belgium – [nnabamimuheme@ad.ua.ac.be](mailto:nnabamimuheme@ad.ua.ac.be))

In this paper, I use “marginalization” as a lens to explore the everyday lives of women vendors in the border regions between Uganda and Congo. Women's marginalization is analyzed not only as a form of exclusion but also as a tool for constant negotiation, adaptation, resistance, and resilience. Here, marginalization refers to a social dynamic employed by women to navigate the colonial, post-colonial, and contemporary governance challenges they face daily.

Focusing on the 20th century, as documented in the colonial archives of the Belgian Congo, women appear as a silent presence in demographic studies and tax records. Yet, the conspicuous absence of attention to their daily activities underscores the need to closely examine their situation and the strategies they developed to survive in a constantly changing political context.

The Eastern DRC, often marked by political tensions and economic vulnerability, is a complex region where female vendors struggle for subsistence. In most cases, these women cannot integrate into formal markets, and instead rely on informal exchange networks with other women and communities across the border. They navigate economic, social, and embodied risks, ranging from taxation policies to border enforcement and threats to their physical safety. This issue remains particularly pressing due to ongoing conflicts in Eastern Congo, which continue to affect historically marginalized groups.

The region's unstable power dynamics, coupled with patriarchal customs, have not only marginalized these women but also created spaces in which they exercise agency. They navigate—and at times capitalize on—this marginalization to assert their presence and influence in cross-border trade. By exchanging goods, these women defy cultural, political, and social barriers, developing a way of life that confronts legal and ethical challenges as well as potential threats of violence. They play an essential role in maintaining social and cultural connections between communities in the two countries, exchanging languages and cultural practices, thereby strengthening socio-cultural ties.

Through a gendered and historical perspective, this paper argues that marginalization is not solely imposed but can also be actively negotiated. Women vendors from Congo and Uganda have consistently redefined the boundaries of legality, identity, and culture, navigating within, around, and against systems that seek to exclude them.

## Keywords

Women vendors, Informal Cross-Border Trade (ICBT), Marginalization, Uganda-Congo borderlands, Resilience

# Community lands under siege: The rise of Egodina Osha youth land grabbers in Asaba and her neighbouring communities in Nigeria

Olisa Daniel Iweze

(Department of History & International Studies, University of Benin, Nigeria – [danielolisa@uniben.edu](mailto:danielolisa@uniben.edu)  
& [danielolisa2@gmail.com](mailto:danielolisa2@gmail.com))

Inter-ethnic and communal land conflicts have long been recurrent in many Nigerian communities, often resulting in loss of lives, property destruction, displacement, and disruption of socio-economic activities. In the 1980s, a new trend emerged in Asaba, where some unemployed graduates and school dropout youths formed the Egodina Osha group—meaning “There is money or unexplored wealth in the forest”—and engaged in the sale of community lands to outsiders. Their involvement in land deals was exacerbated by the introduction of the IMF-sponsored Structural Adjustment Programme in 1986, which heightened youth unemployment and incentivized land grabbing.

The creation of Delta State in 1991 and the designation of Asaba as its administrative capital triggered rapid urbanization and spatial expansion, increasing land demand. Consequently, the Delta State Government assumed ownership, control, and management of lands in Asaba and its environs under the Land Use Act of 1978 for development purposes. This intervention disrupted the customary land tenure system, with the government acquiring 70% of land in Asaba. The resulting tension between community elders and the government led to litigation. In response, community elders established land committees to oversee communal land sales and related matters. Some youth, feeling excluded from these committees, formed parallel land committees under the Egodina Osha designation. The group gained prominence, attracting many youth and spreading to neighboring communities including Ibusa, Okpanam, Oko, and Ogwuashi Uku.

The Egodina Osha engaged in forceful and unlawful claims, possession, and sale of community and individual lands. Attempts by community leaders to reclaim sold lands often resulted in violence, property destruction, and ongoing litigation.

This paper aims to: (i) examine the causes and nature of youth–community conflicts over land in Asaba and its environs; (ii) identify the economic, social, and political implications of these conflicts on community institutions, peace, and security; (iii) assess conflict resolution strategies adopted by communities, individuals, and stakeholders; (iv) analyze the role of the state government and judiciary in resolving land disputes, and the present socio-economic status of the Egodina Osha youth groups; (v) develop strategies for enhanced youth–community cooperation and peacebuilding for policymakers and institutions handling intra-community mediation; and (vi) propose policy recommendations for sustaining youth–community dialogue as a mechanism for peacebuilding in land-conflicted regions in Nigeria and Africa.

The study adopts a qualitative methodology, utilizing both primary and secondary sources, which are critically analyzed through historical narratives.

## Keywords

Land grabbing, Communal, Urbanization, Asaba, *Egodina Osha* youth

# Theorizing African agency in the political economy of global energy transition

**Olusola Ogunnubi**

(Queen's University, Kingston, Canada – [Olusola.ogunnubo@queensu.ca](mailto:Olusola.ogunnubo@queensu.ca))

Over the last two decades, debates among experts and stakeholders addressing global warming and promoting sustainable energy solutions have progressed steadily, marked by the establishment of two landmark multilateral environmental agreements (MEAs) in the final decade of the 20th century. With the adoption of the Paris Agreement in 2015, recent discussions have increasingly focused on the global 'energy transition'. Technological change and innovation are widely recognized as pivotal to achieving climate mitigation targets.

However, while environmental governance regimes have been designed to combat climate change and encourage states and non-state actors to fulfil their obligations, less attention has been paid to the asymmetric impacts and unintended consequences of new technologies developed and deployed to realize energy transition goals. The absence of clearly defined mechanisms to address technological impacts on natural resource management reflects a deficiency in the governance of the natural resource sector.

The 'new' scramble for Africa's energy resources by extra-regional actors, both from the Global North and emerging powers, represents a critical empirical juncture to re-examine the agency of resource-rich non-Western countries. This study focuses specifically on Africa's response to the development and deployment of new technological innovations in the natural resource sector, innovations that are central to the energy transition, and explores the implications for achieving a socially equitable, or 'just', energy transition.

By examining African agency in the global energy transition, this research aims to generate insights for more effective resource governance mechanisms. It centers Africa's role in the geopolitics of global energy transition, both in terms of normative policy frameworks and the value chain of the resource extractive industry. Drawing on a multidisciplinary literature base, the study conceptually frames its analysis through agential constructivism, outlining the causal mechanisms through which African actors' agency is enabled, constrained, or disabled in the context of global energy transition.

## Keywords

African agency, Clean technology, Just transition, Paris Agreement

# Land, livelihoods, and the limits of reform: The RUGA controversy in Nigeria

**Olutomiwa Binuyo**

(Institute for Social Development, University of the Western Cape, Cape Town, South Africa – [4109217@myuwc.ac.za](mailto:4109217@myuwc.ac.za))

**Igbagbodayo Ogunkeye**

(Department of Livestock Science and Sustainable Environment, Federal University of Agriculture, Abeokuta, Nigeria – [ogunkeyeaanuoluwapo@gmail.com](mailto:ogunkeyeaanuoluwapo@gmail.com))

Conflicts between sedentary farmers and nomadic herders in West and Central Africa (WCA) have escalated over the past decade, resulting in widespread violence, socio-economic instability, and food insecurity. According to the 2022 World Food Programme report, Nigeria accounts for 53% of the projected food insecurity in the WCA region due to persistent factors such as conflict, climate variability, and economic downturns.

The World Bank (2022) indicates that approximately 77% of Nigeria's landmass is used for farming. Despite this extensive agricultural use, historical tensions between nomadic Fulani herders and sedentary farmers have intensified, primarily due to competition over scarce resources such as water and arable land. These pressures have been exacerbated by rapid population growth, climate-induced desertification, and shifts in land use patterns.

In January 2019, the Nigerian government initiated discussions and planning for the Rural Grazing Area (RUGA) settlement policy under the National Livestock Transformation Plan (NLTP), aiming to provide structured grazing and settlement facilities for pastoralist communities. However, the policy faced immediate and widespread opposition from the very farmers it intended to benefit. Critics perceived the policy as ethnically biased, favoring Fulani herders over sedentary farmers, leading to protests and a rapid suspension of the initiative. This swift reversal highlighted the deep socio-political fractures embedded in land governance and state policymaking.

This paper critically reassesses the viability of the RUGA settlement policy as a conflict resolution tool by examining its conception, rapid reversal, and surrounding socio-political dynamics. Employing a qualitative case study approach, the research combines documentary analysis and content analysis of policy documents, media narratives, and existing literature. It utilises a critical agrarian political economy framework, drawing on theories of political ecology and state-society relations.

The study identifies major shortcomings in policy design and implementation, notably insufficient stakeholder engagement and limited transparency. Findings suggest that the RUGA policy could have effectively mitigated herder-farmer conflicts if strategically developed and inclusively implemented. While RUGA was framed as a technocratic solution to rural insecurity, its failure reflects broader patterns of exclusion, mistrust, and elite-driven policymaking in Nigeria's agrarian sector.

The research recommends revisiting and reintroducing the RUGA framework or similar models with significant modifications. Emphasizing equitable resource management, inclusive governance, and robust stakeholder consultations can enhance long-term policy effectiveness. Reimagining RUGA through the lens of equitable resource governance offers potential not only for conflict mitigation but also for promoting just and sustainable rural development across WCA.

## Keywords

Land governance, Herders–farmers conflict, Resource politics, RUGA Policy, Nigeria

# Nigeria's oral and cultural heritage in social cohesion and sustainable development

**Oluwatosin Omobolanle Ogwezy**

(Department of Public Law, University of Port Harcourt, Nigeria – [oluwatosin.ogwezy@uniport.edu.ng](mailto:oluwatosin.ogwezy@uniport.edu.ng))

This paper examines the role of Nigeria's oral traditions and material cultural heritage in promoting social cohesion and sustainable development. It posits that Nigeria's rich oral traditions—including folktales, proverbs, songs, storytelling, and oral poetry—transmit knowledge, history, cultural values, and social norms across generations, thereby preserving the collective memory and identity of diverse communities such as the Yoruba, Igbo, Hausa, and Fulani. These narratives promote shared values such as morality, justice, hospitality, and communal living, which transcend ethnic and religious divides, fostering national unity and mutual respect in Nigeria's pluralistic society.

Section 21 of the Nigerian Constitution (as amended) guarantees citizens the right to develop, promote, and preserve their cultures, and to use them as instruments for promoting national identity and unity, highlighting the constitutional importance of cultural preservation. Nigeria's oral and cultural heritage is regulated primarily by the National Commission for Museums and Monuments (NCMM) Act, Cap N19 of the Laws of the Federation of Nigeria (2004), which governs the preservation and protection of both tangible and intangible cultural heritage. This paper argues that the current legal framework is outdated and requires urgent revision to adequately safeguard Nigeria's diverse heritage resources.

The use of indigenous languages in oral literature strengthens cultural identity and social trust, which are foundational for social cohesion in a multi-ethnic society. Material cultural heritage also has significant socio-economic potential through cultural tourism, education, and community participation, which can generate income and promote cultural pride. Examples include historic sites, traditional festivals, museums, and cultural landmarks such as Obudu Ranch in Cross River, Yankari Game Reserve in Bauchi State, and the Wole Soyinka Centre in Lagos. These sites attract tourists, whose spending significantly contributes to regional economies, with cultural tourism driving personal income and employment opportunities across various regions.

In terms of sustainable development, Nigerian oral traditions serve as educational tools that embed indigenous knowledge and environmental ethics within communities. A recent study with Nigerian schoolchildren aged 8 to 13 years in grades 4–6 from eight private primary schools in Kaduna State and the Federal Capital Territory (FCT) showed that exposure to African folklore improved understanding and appreciation of sustainable resource management practices. In the study, one group was taught the Bini folktale “Why the Sky is Far Away,” which imparts lessons on respecting nature and wise resource use.

In conclusion, Nigeria's oral traditions and material cultural heritage are indispensable for promoting social cohesion and sustainable development. This paper recommends deliberate policies that integrate oral traditions and cultural heritage into national education, media, and development programs, alongside amendments to the legal framework regulating heritage preservation.

## Keywords

Oral traditions, Material cultural heritage, Social cohesion, Sustainable development, Cultural identity



# Zircon and ilmenite extraction in Northern Senegal: Sand minerals that escalate ecocide

**Papa Sow**

(NAI – Nordic Africa Institute, Uppsala, Sweden – [papa.sow@nai.uu.se](mailto:papa.sow@nai.uu.se))

This study aims to analyze the links between extractivism, tourism, migration, and climate change in a mining area in Northern Senegal. The *Loumpoul Desert*, located 200 km north of Dakar, is a semi-arid and almost desert region in northern Senegal. It is one of the six most visited tourist sites in the country. The desert was shaped by wind action over geomorphological history. Over the past 30 years, Loumpoul has become a safe hiking area attracting tourists from around the world.

In addition to tourism, a French multinational company – *ERAMET Grande Cote Operations* – has begun exploiting critical minerals: zircon sand (*zirconium silicate*,  $\text{ZrSiO}_4$ ) and ilmenite. The northern Senegalese zircon deposit, being the fourth largest in the world, is a silicate-group mineral extracted from sand and used mainly in jewelry, the nuclear industry, ceramics, tiles, and the automobile sector. It is valued for its ability to withstand high temperatures.

The extraction of zircon and ilmenite affects the physical environment in its biophysical characteristics, mobility, and socio-economic activities, particularly tourism, agriculture, and livestock. This creates a situation of acute vulnerability for local populations and tourism enterprises. Local communities denounce the ecocide being perpetrated across their ecological landscapes, areas rich in tangible and intangible resources.

The study focuses on multiple senses of belonging, forced displacement, and social injustices, as well as the loss of ecological traditions caused by the harmful practices of the zircon industry. Proactive intercommunity meetings, the establishment of an inventory catalogue of lost fauna and flora species, and the use of social media are all resilience strategies employed by local communities to preserve endangered landscapes and ecosystems.

The paper begins with a section presenting the main analytical axes that serve as a theoretical basis for addressing the issue. Second, it explains the methodology used to gather information, based on an ecosocial ethnographic approach. Third, it contextualizes the areas where the research was conducted, which serve as case studies. Fourth, it presents the main challenges facing these areas and analyzes the research results. Finally, it concludes with a series of reflections and insights generated during the research process.

## Main Methods and Data

The paper is part of a larger research project dedicated to studying the links between migration, climate change, and development cooperation in Senegal. The project, carried out from 2022 to 2025, focuses on public policy analysis, expert consultations, and fieldwork in different regions of Senegal. Initial observations were complemented by informal conversations with local populations and, progressively, by formal interviews with various local actors who hold significant influence within their communities. These progressive processes broadened the research lens and incorporated variables not initially anticipated.

## Key Findings and Broader Implications of the Research

This paper highlights the urgent need for stronger governance, community inclusion, and sustainable practices in Senegal's mining sector. Key recommendations include:

The Senegalese government should promote broad consultations with all stakeholders in zircon and ilmenite mining to prevent arbitrary arrests and intimidation of local populations by mining companies. To boost local and green industry, mineral processing techniques should be well-mastered and carried out domestically.

Finally, national and local authorities must strengthen the implementation of the existing Mining Code and Green Industry Policy, which, if effectively enforced, could mitigate environmental and social impacts.

## Keywords

Critical minerals, Mobility, Tourism, Ecocide, Social justice

# Is there a place for plant-based South African products on the world market? Lessons from practice

---

**Patrick Van Damme**

(Faculty of Tropical AgriSciences, Czech University of Life Sciences Prague, Praha – Suchbát, Czech Republic; Faculty of Bioscience Engineering, Ghent, Ghent University, Belgium – [Patrick.VanDamme@UGent.be](mailto:Patrick.VanDamme@UGent.be))

The African continent harbours a wealth of natural resources. Most people, however, tend to think of these in terms of copper, coltan, uranium, phosphate, and other minerals. Yet nature also offers a vast range of plant-based resources. Indeed, plants are used for food and beverages, for their medicinal properties, and for timber used in construction and furniture production, among other applications.

However, most of these products and by-products are traditionally processed and often fail to meet commercial standards or the criteria of (potential) customers beyond the local market. South Africa, however, has a few plant-based products that have succeeded both regionally and internationally, demonstrating that there is real potential for local communities to generate employment and income, and thereby secure their livelihoods.

## **Keywords**

Africa, Ethnobotany, Plant domestication, Income creation, Dryland ecology

# “Plunder for profit?” Zimbabwe’s look east policy, Chinese firms, natural resources, and the environment since 2000

**Peter Uledi**

(University of the Free State, South Africa – [peteruledy@gmail.com](mailto:peteruledy@gmail.com))

Premised on Zimbabwe’s “Look East Policy” introduced in the mid-2000s, this paper examines Sino–Zimbabwean relations and their impact on natural resource extraction, the environment, and rural development from 2000 to the present. Chinese firms operating in Zimbabwe, particularly in the mineral extraction sector, have enjoyed government protection under the banner of “our all-weather friend.” They have exploited this protection to plunder natural resources, causing severe environmental degradation and disrupting rural livelihoods. This environmental destruction has largely gone unchallenged.

The operations of certain Chinese mining companies reveal preferential treatment by the government and law enforcement agencies, highlighting how politics has played a pivotal role in granting access to and control over natural resources. I argue that Sino-Zimbabwean relations have served primarily to reproduce and perpetuate exploitation, resulting in significant environmental harm.

The environmental impacts of some Chinese companies operating in Zimbabwe can only be described as catastrophic. Several firms discharge toxic waste into water bodies, causing human illnesses and livestock deaths. Companies involved in diamond, lithium, and chrome mining have left behind extensive degradation, dumping slag that clogs dams and rivers, reducing water availability for irrigation and livestock. In regions where Chinese companies operate, rivers exhibit high levels of toxins. Irrigation schemes in some parts of the country have been shut down due to river and dam siltation linked to these activities.

Using a qualitative research methodology, this paper argues that, due to the substantial financial investments Chinese firms have made in Zimbabwe’s economy, the government has largely turned a blind eye to environmental regulations. Furthermore, joint ventures between Chinese firms and high-profile Zimbabwean politicians add another dimension to this issue, helping explain why Chinese companies continue to degrade and pollute water bodies with impunity.

## Keywords

Chinese, Environment, Look East Policy, Zimbabwe, Degradation, Investment

# The making and unmaking of the Cattle Frontier in Madagascar, 1870s–1970s

Samuël Coghe

(Ghent University, Belgium – [samuel.coghe@ugent.be](mailto:samuel.coghe@ugent.be))

Even before Madagascar became a French colony in 1896, many European observers imagined the island as the next Argentina: an immense, yet underexploited, cattle frontier that could be transformed into a profitable source of commodities. This optimism stemmed from prior knowledge of Madagascar's favourable disease ecology, as well as the existence of a considerable precolonial trade in live cattle and hides during the 19th century, controlled by the Merina kingdom and other independent polities on the island. While live cattle were mainly exported to the Mascarenes, hides found their way to Germany, the United States, and France.

It was, however, only under colonial rule that the commodification and extraction of cattle reached significant dimensions. Alongside hides and live cattle, a new export industry for canned and frozen meat emerged from the 1910s onwards, marked by the establishment of several large meat factories across the island. After the Second World War, however, the export trade entered a period of crisis, and despite a brief recovery in the 1960s and early 1970s, livestock exports from Madagascar ultimately collapsed.

Drawing on and adapting the concept of commodity frontiers (e.g. Beckert *et al.*, 2021), a framework gaining prominence in the global history of capitalism, this presentation analyses the making and unmaking of Madagascar's cattle frontier from the late precolonial to the early postcolonial period, with a particular focus on the years of French colonial rule (1896–1960). While it centres on cattle commodity exports, and thus on processes of “resource extraction”, it views these only as the final stage in a broader commodification process: one that was promoted, implemented, but also resisted, ignored, and rejected by a multitude of actors, from French veterinary scientists to Malagasy pastoralists, *en passant par* Indian intermediaries. This process had many unintended consequences.

Commodification also entailed, among other things, the introduction of new cattle breeds and disease management practices, the taxation of herds and herders, the repression of cattle theft, and the dissemination of new production techniques. Through the lens of the cattle/commodity frontier, this analysis demonstrates how cattle production and exportation on the island were profoundly shaped by economic and scientific transformations in livestock production across the wider world.

## Keywords

Cattle, Colonialism, Commodity frontiers, Meat, Hides

# How “responsible sourcing” enables green extractivism: Strategic (in)visibility in the cobalt sector in the Democratic Republic of Congo (DRC)

**Sarah Katz-Lavigne**

(Institute of Development Policy, University of Antwerp, Belgium; Centre d’Expertise en Gestion Minière, Université Catholique de Bukavu, DR Congo; [SarahKL@protonmail.com](mailto:SarahKL@protonmail.com))

**Sara Geenen**

(Institute of Development Policy, University of Antwerp, Belgium; Centre d’Expertise en Gestion Minière, Université Catholique de Bukavu, DR Congo; [Sara.Geenen@uantwerpen.be](mailto:Sara.Geenen@uantwerpen.be))

**Hadassah Arian**

(Institute of Development Policy, University of Antwerp, Belgium; [Hadassah.Arian@uantwerpen.be](mailto:Hadassah.Arian@uantwerpen.be))

This paper contributes to the literature on green extractivism by examining how so-called “responsible sourcing” initiatives enable green extractivism, allowing companies to strategically conceal their activities while governing artisanal and small-scale (ASM) cobalt mining, effectively “hiding in plain sight.” Although NGO and UN project billboards are ubiquitous across the Democratic Republic of Congo (DRC), international responsible sourcing initiatives, designed to “clean up” mines where cobalt is extracted through ASM, often remain understated in their public presence.

Actors in the responsible sourcing space typically partner with local stakeholders (such as mining cooperatives) invoking local empowerment and long-term sustainability. Yet, this does not capture the full picture. We argue that high-profile corporate backers, including mining companies and automobile manufacturers, strategically manage their visibility to mitigate perceived market risks. They simultaneously maintain a veil of secrecy over their own involvement with more “controversial” segments of the mineral supply chain and exercise governance over the cobalt-mining sector at varying degrees of distance via intermediaries such as NGOs and cooperatives.

Drawing on scholarship on (in)visibility from political ecology, this paper makes a theoretical contribution by illustrating how large corporate actors invisibilize themselves. We demonstrate that the selective visibility of specific supply chain links constitutes a key corporate strategy for reputational risk management, facilitated by responsible sourcing initiatives. This study highlights the strategic (in)visibilization of relational entanglements in cobalt extraction, particularly regarding corporate involvement and governance of “problematic” ASM operations.

## Keywords

Green extractivism, Responsible sourcing, Cobalt, Democratic Republic of Congo, (In)visibility

# Contrasting patterns of denitrification product ratios ( $\text{N}_2\text{O}/(\text{N}_2\text{O}+\text{N}_2)$ ) in the Congo Basin

## Serge Alebadwa

(Institute of Meteorology and Climate Research, Atmospheric Environmental Research (IMK-IFU), Karlsruhe Institute of Technology, Garmisch-Partenkirchen, Germany – [serge.mombenga@kit.edu](mailto:serge.mombenga@kit.edu))

## Marijn Bauters

(Q-Forest lab, Department of Environment, Ghent University, Ghent, Belgium)

## Roxanne Daelman

(Q-Forest lab, Department of Environment, Ghent University, Ghent, Belgium; Isotope Bioscience Laboratory, Department of Green Chemistry and Technology, Ghent University, Ghent, Belgium)

## Matti Barthel

(Department of Environmental System Science, ETH Zurich, Zurich Switzerland)

## Georg Willibald

(Institute of Meteorology and Climate Research, Atmospheric Environmental Research (IMK-IFU), Karlsruhe Institute of Technology, Garmisch-Partenkirchen, Germany)

## Thomas Sibret

(Q-Forest lab, Department of Environment, Ghent University, Ghent, Belgium; Isotope Bioscience Laboratory, Department of Green Chemistry and Technology, Ghent University, Ghent, Belgium)

## Dries Landuyt

(Q-Forest lab, Department of Environment, Ghent University, Ghent, Belgium)

## Pascal Boeckx

(Isotope Bioscience Laboratory, Department of Green Chemistry and Technology, Ghent University, Ghent, Belgium)

## Ralf Kiese

(Institute of Meteorology and Climate Research, Atmospheric Environmental Research (IMK-IFU), Karlsruhe Institute of Technology, Garmisch-Partenkirchen, Germany)

Tropical rainforests are a major source of  $\text{N}_2\text{O}$  (Tian et al., 2020), yet the factors controlling the  $\text{N}_2\text{O}$  product ratio of denitrification ( $\text{RN}_2\text{O} = \text{N}_2\text{O}/(\text{N}_2\text{O}+\text{N}_2)$ ) remain poorly understood. This study aimed to assess the dynamics of soil  $\text{N}_2\text{O}$ ,  $\text{CH}_4$ ,  $\text{CO}_2$ , and  $\text{N}_2$  emissions across different tree species in an 85-year-old tropical plantation and natural *Gilbertiodendron dewevrei* forests in the Congo Basin. These experimental plantations were selected because tree species originating from identical soil conditions can alter topsoil chemistry, particularly through soil acidification (Bauters et al., 2017), providing a unique setting to investigate vegetation-mediated drivers of greenhouse gas and  $\text{N}_2$  emissions.

We combined in-situ soil GHG flux measurements using fast-box and manual static chamber methods with soil-core He substitution incubations for direct  $\text{N}_2$  measurements. Correlation analyses incorporated existing soil and vegetation data from Bauters et al. (2017). Our results indicate that plantation soils acted as sources of  $\text{N}_2\text{O}$  and  $\text{CO}_2$ , with fluxes ranging from 0.69 to 360.67  $\mu\text{g-N m}^{-2} \text{h}^{-1}$  (mean:  $56.72 \pm 46.25$ ) and 11.8 to 582.1  $\text{mg-C m}^{-2} \text{h}^{-1}$  (mean:  $259.7 \pm 69.4$ ), respectively.  $\text{CH}_4$  fluxes ranged from -148.9 to 887.01  $\mu\text{g-C m}^{-2} \text{h}^{-1}$  (mean:  $-35.1 \pm 85.1$ ), with sporadic emissions observed in *Pericopsis elata* plantations.

Tree species significantly influenced soil GHG fluxes, primarily mediated by carbon and nitrogen contents (soil C/N, soil  $^{15}\text{N}$ , soil  $^{13}\text{C}$ , litter  $^{15}\text{N}$ , canopy  $^{13}\text{C}$ ), soil pH, and soil moisture. Notably, plantation soils exhibited low  $\text{N}_2$  fluxes,

with *Pericopsis elata* plantations showing higher  $\text{N}_2\text{O}/(\text{N}_2\text{O}+\text{N}_2)$  ratios, indicative of incomplete denitrification. In contrast, natural *Gilbertiodendron dewevrei* forests displayed low  $\text{N}_2\text{O}$  and high  $\text{N}_2$  emissions, reflecting near-complete denitrification relative to the plantations. These findings highlight the role of tree species and soil properties in modulating denitrification pathways and greenhouse gas emissions in tropical ecosystems.

#### Keywords

Soil  $\text{N}_2\text{O}$ -  $\text{CH}_4$  and  $\text{CO}_2$  fluxes, Soil  $\text{N}_2$  flux, soil  $R_{\text{N}_2\text{O}}$ , denitrification, Tropical plantations, *Gilbertiodendron dewevrei* forest, Congo Basin



# Does scale matter? Comparative analysis of land-use/cover changes in industrial, artisanal and small-scale mining landscapes in the Democratic Republic of Congo

**Serge Mugisho Mukotanyi**

(Institute of Development Policy, University of Antwerp, Belgium; Centre d'Expertise en Gestion Minière/Université Catholique de Bukavu, DRC; Africa Museum, Belgium – [Serge.Mukotanyi@student.uantwerpen.be](mailto:Serge.Mukotanyi@student.uantwerpen.be))

**Christiane Migabo**

(Africa Museum, Belgium; Université Catholique de Louvain, Belgium – [nabintu.migabo@ucbukavu.ac.cd](mailto:nabintu.migabo@ucbukavu.ac.cd))

**Sara Geenen**

(Institute of Development Policy, University of Antwerp, Belgium; Centre d'Expertise en Gestion Minière/Université Catholique de Bukavu, DRC – [sara.geenen@uantwerpen.be](mailto:sara.geenen@uantwerpen.be))

**Caroline Michellier**

(Africa Museum, Belgium; Université Catholique de Louvain, Belgium – [caroline.michellier@africamuseum.be](mailto:caroline.michellier@africamuseum.be))

**Bossissi Nkuba**

(Institute of Development Policy, University of Antwerp, Belgium; Centre d'Expertise en Gestion Minière/Université Catholique de Bukavu, DRC; Africa Museum, Belgium – [Bossissi.Nkuba@uantwerpen.be](mailto:Bossissi.Nkuba@uantwerpen.be))

The expansion of industrial and artisanal mining in the Congo Basin is increasingly competing with forests and other land uses. This study was conducted in South Kivu and Lualaba provinces in the eastern and southern Democratic Republic of Congo (DRC), focusing on landscapes dominated by artisanal and small-scale mining (ASM) of gold, tantalum, tin, and tungsten (3TG) and industrial mining (IM) of cobalt and copper. The study aimed to (1) quantify land-use/land-cover (LULC) changes in ASM and IM landscapes in relation to the political history of mining, (2) identify key drivers and mechanisms behind spatial transformations, and (3) determine socioeconomic and geographic factors influencing LULC dynamics.

Using a methodology combining geographic information systems, remote sensing, geostatistics, and landscape ecology tools, we observed a 15% loss of dense forest between 2008 and 2022 in ASM areas, replaced by degraded forest (+5.7%), field and fallow land (+2.3%), and mining (+7.5%). In IM landscapes, forested areas were converted to fields, fallow lands, and mining zones, often accompanied by potential urban expansion. IM landscapes exhibit large-scale disturbances, including extensive open pits and cleared zones, whereas ASM landscapes show localized, dispersed patterns of change. Proximity to active mining sites strongly influenced LULC changes, with rates of transformation decreasing with distance from operations. Other key factors included topography, road networks, proximity to villages, and access to water for processing.

While IM causes widespread habitat fragmentation and homogenisation, ASM contributes to localized deforestation and ecosystem fragmentation. Both forms of mining result in ecosystem loss or degradation and diminished ecosystem services. These findings underscore the importance of understanding mining-driven LULC changes within broader socio-political and environmental contexts, highlighting the need for participatory restoration measures, afforestation, and policy interventions to mitigate impacts under global change scenarios.

## Keywords

Mining, LULC changes, Spatial transformation, Ecosystem degradation, Participatory restoration

# When governing sustainability transformations turn regressive: Contestations over seed legislation in Ghana

**Siera Vercillo**

(Public Administration and Policy, Wageningen University and Research, The Netherlands – [siera.vercillo@wur.nl](mailto:siera.vercillo@wur.nl))

**Logan Cochrane**

(College of Public Policy, Hamad Bin Khalifa University, Qatar – [logan.cochrane@gmail.com](mailto:logan.cochrane@gmail.com))

The IPCC recommends transformative agricultural policies to enhance resilience and empower vulnerable communities globally. Yet, considerable debate persists over how such transformations should be designed and governed. Some scholars advocate rapid, top-down approaches guided primarily by scientific evidence, while others emphasise bottom-up, grassroots-led change rooted in local knowledge and ontologies. These tensions are particularly evident in agricultural adaptation, where technology-driven interventions often compete with community-based agroecological models that are less scalable. Central to these debates is seed governance.

This study employs qualitative and discursive analysis of plant breeding legislation in Ghana to demonstrate how agricultural transformations can unfold incrementally and amid contestation when governance lacks broad participation. Our case illustrates that legislative changes enabling genetically modified (GM) seeds represent a shift from subsistence to commercial agriculture, with potentially regressive outcomes for justice and sustainability. Top-down governance processes underpinning GM adoption cannot fully accommodate diverse forms of justice; however, Ghana's pluralistic governance arrangements moderated these effects by providing space for contestation among multiple stakeholders.

## Keywords

Sustainability transformations, Just transition, GM seed, Biotechnology governance, Transformative governance, Agriculture, Ghana, Africa

# Encadrer l'exploitation des ressources naturelles en contexte colonial : l'usage réglementé de la faune en Afrique équatoriale française (1910-1960)

**Simplice Ayangma Bonoho**

(Université de Montréal, Canada – [Simplice.ayangma.bonoho@umontreal.ca](mailto:Simplice.ayangma.bonoho@umontreal.ca))

À partir de l'étude de l'encadrement et du contrôle des ressources fauniques en Afrique équatoriale française (AEF), cette contribution vise à mettre en valeur la manière dont de telles ressources ont connu un début de politisation de leur accès en période coloniale. Le texte entend également faire la lumière sur les dynamiques qui éclairent aujourd'hui les complexités locales de la contestation quotidienne des ressources fauniques. Il s'agit précisément de mettre en évidence les relations entre l'accès aux ressources fauniques et l'autorité coloniale en Afrique centrale sous domination française. L'auteur s'appuie pour ce faire sur le cas d'étude de la chasse de certaines espèces telles que les éléphants, les hippopotames et les rhinocéros, au Gabon et au Moyen-Congo notamment.

## Mots clés

Ressources, Faune, Exploitation, Réglementation, AEF

# 'We did not know it was abuse': Empowering women with disabilities against gender-based violence

---

**Sisa Ngabaza**

(Women's and Gender Studies, University of the Western Cape, South Africa – [sngabaza@uwc.ac.za](mailto:sngabaza@uwc.ac.za))

In most contexts, women with disabilities are typically excluded from discussions on gender-based violence, despite experiencing this violence at much higher rates than women without disabilities. People with disabilities, in many settings, represent a largely invisible population, often hidden from public view by families and communities. This invisibility, exacerbated by societal norms and family dynamics, pushes them further away from support networks and public discourse. Working within a feminist framework and drawing on insights from data obtained from a group of women with various disabilities in South Africa, this paper explores the women's perceptions of how spaces meant to offer protection often keep them hidden from vital knowledge that would be a crucial resource for combating gender-based violence. By sharing their experiences, these women shed light on the compounded vulnerabilities they face, stemming not only from their lack of knowledge as women with disabilities but also from a broader societal lack of understanding among their families, communities, health practitioners, and the justice system. This complex web of ignorance creates barriers that prevent women with disabilities from accessing essential support and protection. In this paper, I highlight the value of information and knowledge as powerful tools in the fight against gender-based violence. I emphasise the urgent need to empower women with disabilities through education and awareness, ensuring their voices are heard and their rights are protected in the ongoing struggle against gender-based violence in South Africa.

## **Keywords**

Disabilities, Women, Knowledge, Empowerment, Abuse, South Africa

# Depth of trade integration and trade margins of environmental goods in Africa

**Socrates Kraido Majune**

(Department of Economics and Development Studies, University of Nairobi, Kenya – [skmajune@uonbi.ac.ke](mailto:skmajune@uonbi.ac.ke))

**Christopher Lchukeyan Segelan**

(Department of Economics and Development Studies, University of Nairobi, Kenya – [Segelanchris@gmail.com](mailto:Segelanchris@gmail.com))

**Owen Nyangoro**

(Department of Economics and Development Studies, University of Nairobi, Kenya – [owen@uonbi.ac.ke](mailto:owen@uonbi.ac.ke))

**Davis Ombane**

(Department of Economics and Development Studies, University of Nairobi, Kenya – [ombanedavis@gmail.com](mailto:ombanedavis@gmail.com))

**Angella Faith Montfaucon**

(World Bank – [angella.f.montfaucon@gmail.com](mailto:angella.f.montfaucon@gmail.com))

**Patricia Ssozi Naluwooza**

(Bank of Uganda – [pnaluwooza@bou.or.ug](mailto:pnaluwooza@bou.or.ug))

This study analyzes the effect of trade integration depth on the export and import margins of environmental (green) goods, using country–product–partner data for 49 African countries and their global partners from 1995 to 2021. We find that Africa is a net importer of green goods, with imports valued at five times the level of exports. Both exports and imports are highly concentrated, with more than half occurring in the Waste Water Management and Potable Water Treatment, and Renewable Energy sectors. South Africa accounts for half of Africa's green goods exports and is also the continent's leading importer. Green goods are primarily exported to Europe and imported from China.

Fixed-effects regression results show that Free Trade Agreements (FTAs) have the strongest amplifying effect on green-good trade margins. The presence of an FTA increases the value, extensive, and intensive margins of exports by 0.7%, 0.3%, and 0.4%, respectively. Similarly, FTAs raise the value, extensive, and intensive margins of imports by 0.55%, 0.2%, and 0.36%. These results remain robust when examining the impact of agreement depth on the top five green-good exports. However, Customs Unions exert a larger effect on the imports of some top-five green-good products.

Finally, discrete-time logit results reveal that the duration of Africa's green-good exports and imports is mainly enhanced by FTAs, both at the aggregate level and for the top five sectors. Taken together, these findings suggest that shallow agreements may have larger short-term effects than deeper agreements in supporting Africa's green transition.

## Keywords

Environmental goods, Green goods, Depth of Trade Agreements, Trade margins, Africa

# How reliable are satellite rainfall estimates in complex terrain? A case study from the Ethiopian Highlands

**Solomon Sebesbew Ewnetu**

(Department of Environment, Ghent University, Belgium; Faculty of Civil and Water Resources Engineering, Bahir Dar University, Ethiopia – [solomonsebesbew.ewnetu@ugent.be](mailto:solomonsebesbew.ewnetu@ugent.be))

**Mekete Dessie**

(Faculty of Civil and Water Resources Engineering, Bahir Dar University, Ethiopia)

**Mulugeta A. Belete**

(Faculty of Civil and Water Resources Engineering, Bahir Dar University, Ethiopia)

**Ann van Griensven**

(Department of Water and Climate, Vrije Universiteit Brussel, Belgium; Water Science & Engineering Department, IHE Delft Institute for Water Education, The Netherlands)

**Kristine Walraevens**

(Department of Geology, Ghent University, Belgium)

**Amaury Frankl**

(Department of Geography, Ghent University, Belgium)

**Enyew Adgo**

(Department of Natural Resources Management, Bahir Dar University, Ethiopia)

**Niko E. C. Verhoest**

(Department of Environment, Ghent University, Belgium)

Satellite and reanalysis rainfall estimates (SREs) offer valuable alternatives to gauge data in data-scarce regions; however, their reliability in areas with complex terrain and highly variable precipitation remains uncertain. This study evaluated six SREs (CHIRPS, ERA5, ERA5-Land, IMERG, MSWEP, and TRMM) against gauge observations for the period 2005-2019. The evaluation employed multiple statistical, categorical, and distributional metrics across daily to seasonal timescales. Terrain-based classification and rainfall-intensity categories were used to examine the influence of topography and event magnitude on product performance.

Results show that the accuracy of SREs improves with temporal aggregation, with monthly data providing the highest reliability for water-resources management. However, their tendency to overestimate light rainfall and underestimate heavy rainfall events indicates the need for careful bias correction in flood and extreme-event analyses. MSWEP, CHIRPS, and IMERG demonstrated balanced and consistent performance across all metrics, rainfall intensities, and terrain zones. In contrast, ERA5 and ERA5-Land consistently overestimated mean rainfall. All SREs were effective in identifying dry days, but their performance declined with increasing rainfall intensity. No significant performance differences were observed across altitude classes.

This study offers valuable guidance for selecting rainfall products and highlights their respective strengths and limitations, supporting climate and hydrological research in data-scarce regions of the Ethiopian Highlands.

## Keywords

Satellite/Reanalysis rainfall products, Remote sensing, Comprehensive evaluation, Mountainous Basin, Ethiopia

# The taxation of artisanal mining in conflict-affected contexts: from armed predation to 'informal formalisation'

**Steven Van Bockstael**

(University of Groningen, The Netherlands – [s.j.n.van.bockstael@rug.nl](mailto:s.j.n.van.bockstael@rug.nl))

**Jeroen Cuvelier**

(Ghent University, Belgium – [Jeroen.Cuvelier@ugent.be](mailto:Jeroen.Cuvelier@ugent.be))

**Koen Vlassenroot**

(Ghent University, Belgium – [Koen.Vlassenroot@ugent.be](mailto:Koen.Vlassenroot@ugent.be))

**Josaphat Musamba Bussy**

(Ghent University, Belgium – [Josaphat.MusambaBussy@ugent.be](mailto:Josaphat.MusambaBussy@ugent.be))

Artisanal and small-scale mining (ASM) is a key livelihood for the rural poor in many developing countries. While ASM can be transient and expose local communities to environmental and public health risks, it can also become a powerful engine for rural development, particularly in areas where the geology allows for sustained extraction. ASM is also infamously linked to armed conflict, both in popular understandings of so-called “conflict diamonds” and “conflict minerals” and in academic studies linking natural resource abundance to increased risks of (civil) war.

ASM has proven difficult to govern and regulate globally. While ASM operations exist on a continuum ranging from fully formalised operations to criminal enterprises involving forced labour, the majority of artisanal miners operate in an informal grey zone. They interact with governments in ways that range from illegal participation of authorities to tacit support. Most, if not all, of these interactions can be classified as corruption. However, taking cues from literature on the “informal formalisation” of land tenure arrangements, these payments can likewise be interpreted as part of “informal formalisation” efforts, with corrupt practices functioning as forms of taxation. Analysing relatively small instances of corruption and bribery as “taxation” helps reveal the complex web of relationships between actors involved in artisanal mining and those involved in governance more broadly.

These informal payments also occur in areas where the state's territorial control has been taken over by non-state armed groups. Moreover, the taxation of miners and mineral traders by armed groups has implications for the building of public authority, as the formalisation of artisanal mining activities is considered an important aspect of (re-)building the state. The practices of informal payments, as well as the thresholds beyond which they are considered outright predation, demonstrate that (post-conflict) ASM formalisation efforts are not necessarily unrealistic. What remains less clear is the extent to which these efforts rely on enforcement, particularly the (threat of) armed force, and the expectations raised by these taxation processes. What are the expectations of those being taxed, and at which point do these expectations vanish, making payment no longer negotiable but the result of armed predation?

This paper contributes to answering these questions by conceptualising taxation practices in the artisanal mining sector in conflict-affected areas and areas of limited or negotiated statehood. While these practices are recurrently mentioned in the literature, they have not previously been explicitly linked to formalisation processes in ASM. Secondly, the paper contributes empirically through selected case studies in the eastern provinces of the DR Congo, where artisanal mining is a critical livelihood for the rural poor, and where non-state armed groups have contested state-led governance mechanisms for the past three decades.

## Keywords

Artisanal and Small-Scale Mining, Armed conflict, Democratic Republic of Congo, Taxation, Formalisation



# De la course aux matières premières aux déplacements massifs des populations : comprendre la polycrise à l'Est de la RD Congo

**Sylvie Imata Bulaya**

(Université de Gand, Belgique; Institut Supérieur de Bukavu, DR Congo – [sylvieimata@gmail.com](mailto:sylvieimata@gmail.com))

**Gabriel Kamundala**

(Institut Supérieur de Bukavu, DR Congo)

Les provinces du Nord et du Sud-Kivu illustrent de manière exemplaire la complexité des crises contemporaines. Ces crises se caractérisent par des enjeux économiques, humanitaires et politiques profondément imbriqués. La dynamique des conflits armés, de l'extractivisme, de la violence structurelle et de la gouvernance fragile qui prévaut depuis plusieurs décennies trouve son origine dans l'exploitation intensive des matières premières, en particulier les 3T (cassitérite, coltan et wolframite), ainsi que l'or et le cobalt. Outre leur richesse minière, ces provinces se distinguent par l'abondance de leurs ressources hydriques et forestières. L'exploitation et l'exportation des bois constituent un point de tension majeur pour les autorités locales et les acteurs internationaux. La compétition pour le contrôle de ces ressources naturelles a généré des déplacements massifs de populations, dans des conditions humanitaires souvent déplorables.

Cette étude s'appuie sur la théorie de la polycrise, laquelle postule que les crises multiples et interdépendantes — telles que l'exploitation minière, les conflits armés, les crises humanitaires et les déplacements forcés — interagissent de manière complexe et souvent synergique. Si les liens entre ces crises sont largement documentés, notre recherche se concentre sur la manière dont elles s'imbriquent simultanément, se renforçant mutuellement et compliquant toute tentative de résolution.

Fondée sur des enquêtes de terrain menées dans les provinces du Nord et du Sud-Kivu, cette étude vise à analyser les mécanismes par lesquels les logiques extractives et les déplacements forcés contribuent à la persistance d'une polycrise prolongée.

## Mots clés

atières premières, Polycrise, Déplacements forcés, Logiques extractives, Est de la RDC

# Africa at the nexus of green colonialism: Geopolitics and governance of critical raw materials in the DRC and Namibia

**Takudzwa Mharadze**

(Zimbabwe Open University, Zimbabwe & University of Johannesburg, South Africa – [takuumharadze@gmail.com](mailto:takuumharadze@gmail.com) & [224254491@students.uj.ac.za](mailto:224254491@students.uj.ac.za))

Africa's substantial reserves of critical raw materials, including cobalt and lithium, essential for renewable technologies, place the continent at the centre of global geopolitical competition. This paper examines the complex geopolitical dynamics and governance challenges surrounding these resources, particularly in the Democratic Republic of Congo (DRC) and Namibia, introducing the notion of "green colonialism."

Through qualitative case studies employing policy analysis, stakeholder interviews, and trade assessments, this research investigates how the global decarbonization agenda influences local governance structures and socio-economic outcomes. The findings indicate that critical minerals extraction in the DRC and Namibia remains profoundly shaped by external economic actors, including multinational corporations and foreign governments. These actors often dictate the terms of extraction and trade, resulting in substantial economic outflows and limited local development.

Despite national strategies promoting beneficiation, persistent structural and governance weaknesses hinder the effective local management of resources, perpetuating colonial-era patterns of extraction and economic dependency. In the DRC, cobalt mining frequently involves exploitative labour conditions, particularly within artisanal mining sectors. In Namibia, strategic lithium projects, while formally aligned with national development policies, often prioritise foreign capital interests, undermining local community livelihoods and environmental sustainability.

Regional and global geopolitical rivalries further exacerbate these tensions, as powerful countries seek dominance in securing essential resources for clean energy transitions. Efforts to achieve greater resource sovereignty through regional initiatives, such as the African Union's Green Minerals Strategy, offer potential pathways to challenge existing exploitative patterns. These initiatives advocate regional cooperation, equitable benefit-sharing, and strategic autonomy, yet practical implementation remains limited due to institutional weaknesses and fragmented policy landscapes.

This study argues that addressing "green colonialism" requires comprehensive governance reforms, transparent stakeholder engagement, robust regional collaboration frameworks, and concerted efforts to strengthen local capacity. It emphasizes the urgency of developing inclusive strategies that reconcile global environmental goals with African developmental imperatives. Ultimately, the research concludes that for Africa to leverage its critical raw materials effectively, profound transformations in geopolitical relations, governance practices, and resource management paradigms are imperative to ensure genuine sustainable development rather than perpetuate historical cycles of extraction and dependency.

## Keywords

Critical raw materials, Green colonialism, Geopolitics, Resource governance, DRC, Namibia

# Extensive pig husbandry as a novel approach to primate conservation and sustainable use of African rainforest

**Teresa Costa**

(Faculty of Bioscience Engineering, Department of Plants and Crops, Ghent University, Belgium – [Teresa.Costa@UGent.be](mailto:Teresa.Costa@UGent.be))

**Eduardo de la Peña**

(Faculty of Bioscience Engineering, Department of Plants and Crops, Ghent University, Belgium – [eduardo.delapena@ugent.be](mailto:eduardo.delapena@ugent.be))

**Pablo Manzano**

(Global Change and Conservation Lab, Organismal and Evolutionary Biology Research Program, Faculty of Biological and Environmental Sciences, University of Helsinki, Finland; Helsinki Institute of Sustainability Science (HELSUS), Faculty of Biological and Environmental Sciences, University of Helsinki, Finland; Basque Centre for Climate Change (BC3), Spain; Ikerbasque—Basque Foundation of Science, Spain – [pablo.manzano@bc3research.org](mailto:pablo.manzano@bc3research.org))

Central African tropical forests face critical issues regarding sustainable land use, driven by non-selective bushmeat hunting and the high nutritional needs of rapidly growing populations. Cropland expansion and logging activities pose particular risks to forests, disproportionately affecting endangered primates. While conventional livestock keeping has traditionally relied on ruminants suited to open ecosystems (savannas, parklands, open woodlands), the potential of monogastrics—best adapted to the forest environment—has yet to be thoroughly investigated. Furthermore, international organizations have conventionally sought to implement intensive livestock production systems with a vertical, top-down structure and substantial capital requirements. This contrasts with Africa, where extensive livestock systems, relying on the local natural resource base, dominate and require relatively low capital investment. Conservation practices and development initiatives have often disregarded local populations and their livelihoods, evicting them from the forest without implementing production systems that meet these populations' nutritional needs.

Given these premises, there is a need for an alternative approach to land-use practices in Central African forests that considers local populations' rights and empowers their decision-making. We present a project that aims to test the potential of extensive domestic pig husbandry for: (i) providing sustainable production of nutritionally dense foods, i.e., extensive livestock; (ii) exploring alternative livelihoods for marginalized peoples who hold traditional ecological knowledge of forest ecosystems; (iii) avoiding forest land conversion into agriculture by proposing wildlife-compatible land uses; and (iv) exploring options for sustainable economic interest in wildlife, particularly primates. This approach could potentially generate sufficient economic incentives to prevent land conversion into agriculture and even restore forest corridors on current croplands, thereby connecting isolated protected areas. Crop farming that fully encroaches upon landscapes represents a serious threat to forest species of high conservation value, such as chimpanzees, not only because of land conversion but also due to prevailing human–wildlife conflict.

Additionally, extensive pig husbandry could mitigate another serious threat to wildlife, namely bushmeat hunting, as local farmers could obtain sufficient protein intake from pig breeding, replacing nutrients previously derived from bushmeat. This practice could also be combined with other income sources, such as wildlife ecotourism—given the importance of primate populations as an asset—while simultaneously promoting sustainable livelihoods. Moreover, generating sustainable forest uses could allow previously evicted indigenous populations to access these areas without harming the resident wildlife. Considering the local resource knowledge of former hunter-gatherer populations who have recently settled offers an opportunity for efficient and sustainable resource use, combating marginalization, and addressing malnutrition.

## Keywords

Extensive pig husbandry, Sustainable land use, Alternative livelihoods, Primate conservation, Forest restoration

# The political economy of wildlife

## **Théodore Trefon**

(Africa Museum, Belgium; Ecole Régionale Postuniversitaire d'Aménagement et de Gestion intégrés des Forêts et Territoires tropicaux (ERAIFT), DR Congo – [theodore.trefon@africamuseum.be](mailto:theodore.trefon@africamuseum.be))

## **Krossy Mavakala**

(Ecole Régionale Postuniversitaire d'Aménagement et de Gestion intégrés des Forêts et Territoires tropicaux (ERAIFT), DR Congo – [krossymavakala@yahoo.fr](mailto:krossymavakala@yahoo.fr))

Wildlife is a contested resource par excellence in Central Africa. Forests, its ostensible habitat, serve as arenas where actors compete for access to—and control over—resources. Powerful and politically well-connected commercial actors in the value chain often threaten wildlife sustainability to the detriment of rural subsistence consumers. While wildlife trafficking is considered by INTERPOL as a major criminal enterprise globally, with ramifications ranging from arms trading to money laundering, hunting, trade, and consumption of wild animals remain ordinary ways of life for many rural communities.

The legality–legitimacy dichotomy represents a significant dimension of contestation: 'wildlife for some, meat for others' captures diverging perceptions characterized by strong ideological biases and subjectivity. Questions such as 'whose resources are they?' constitute another dimension of contestation. The conservation of the Congo Basin forests is an international concern aimed at mitigating global climate change. Forests and wildlife populations are symbiotic; without healthy fauna populations, forest diversity and ecological sustainability are threatened. Such discourse, however, often overlooks the tens of millions of Central Africans who depend on bushmeat for daily subsistence.

Wildlife extraction frequently coincides with the extraction of other high-value resources, notably minerals and timber. Artisanal diggers consume bushmeat themselves due to scarce food production near mining sites, which attract migrant laborers engaged either in digging or in providing services such as petty trade, restaurants, and leisure activities. Consequently, the sheer numbers of artisanal diggers significantly impact bushmeat consumption. Logging presents a second example: it opens forest frontiers, resulting in habitat destruction, consumption by workers in logging camps, and facilitation of the bushmeat trade through transportation networks.

Bushmeat, a renewable resource under threat, constitutes a total social fact, as it is embedded in culture and economy and shapes power relations among diverse individuals and networks. Conflicting values and perceptions of wildlife management are therefore relevant to many of GAPSVM18's sub-themes: (1) histories and contemporaneities of natural resource extractivism; (3) contested resources; (4) land rights, particularly in conflicts between local communities and protected areas; (6) climate change and loss/damage to natural resources; (8) how communities navigate and negotiate access to resources; and (12) the spread of zoonotic diseases (e.g., Ebola and HIV). Contestation over wildlife thus constitutes a transversal symposium theme.

Research on the political economy of wildlife management was directly supported by the Royal Museum for Central Africa and by a grant from the UK's Global Challenges Research Fund to ERAIFT/Kinshasa, and indirectly through consultancy work for the Wildlife Conservation Society and USAID-funded assignments. The main product of this work is: T. Trefon (2023) *Bushmeat: Culture, economy and conservation in Central Africa*, London: Hurst.

### **Keywords**

Bushmeat, Central Africa, Wildlife, Political economy analysis, Protected area management

# Community wellbeing and ghost biofuels projects: Abandoned *Jatropha Curcas* large-scale land deal plantations in East Africa

**Wilson Omalenge Ndenyele**

(Department of Social Sciences, Technical University of Mombasa, Kenya – [wndenyele@tum.ac.ke](mailto:wndenyele@tum.ac.ke))

In the mid-2000s, large-scale farming of *Jatropha curcas* was aggressively promoted in Sub-Saharan Africa as a means to mitigate climate change by advancing clean energy production and green energy security. However, many of these *Jatropha* projects were abandoned before reaching the production stage and became non-operational. The impact of abandoned *Jatropha* projects on local communities remains an understudied phenomenon in Kenya and beyond.

Using the case study of the Bedford Biofuels project, implemented by a Canadian investor in the Lower Tana Delta area of Tana River County, Kenya, this article analyzes how failed *Jatropha* projects affected the wellbeing of local communities. Empirical evidence was obtained through individual and focus group interviews, observation, and complemented by secondary sources. The article unpacks the impact of non-operational land deals on local communities, contributing to the limited but growing literature on the consequences of large-scale land investment projects that are abandoned before production.

In general, the study finds that there remains communal 'cohesion' among the local communities affected by this non-operational project, and that some continued 'interest' in the Bedford Biofuels initiative is reflected in community narratives.

## Keywords

Large scale land deals, Non-operational land deals, *Jatropha Curcas*, Tana River County, East Africa-Kenya

# Contested resources, politics and war

**Zanele Vilakazi**

(University of the Western Cape, South Africa – [zanyzanelevilakazi@gmail.com](mailto:zanyzanelevilakazi@gmail.com))

**Ntlantla Valtein**

(Norwegian Agency for Exchange Cooperation (Norec), Norway – [ntlantlavaltein@gmail.com](mailto:ntlantlavaltein@gmail.com))

Natural resources such as land, minerals, water, and forests are indispensable for human survival and the sustenance of livelihoods. In Africa, the control and distribution of these resources are deeply entangled with political power, public authority, and state legitimacy. In fragile contexts marked by political instability or violent conflict, resource governance becomes both a source of contestation and a mechanism of control. The politicisation of access to natural resources often fuels tensions across multiple levels of society, particularly in regions where formal state institutions are weak or absent, leading to the emergence of alternative forms of authority and localized power struggles. These dynamics can contribute to protracted violence, undermine development, and exacerbate existing social inequalities.

The so-called “resource wars” narrative, which frames competition over natural wealth as the primary driver of conflict, has gained traction in both academic and policy circles. However, this interpretation often oversimplifies the complex socio-political, historical, and economic dimensions of conflict and governance. In many cases, conflicts emerge not merely from resource scarcity or abundance, but from unequal access, exclusionary policies, and the instrumentalization of resources for political gain. Resources become not only commodities, but also symbols and tools of power, identity, and resistance.

This abstract highlights pressing issues surrounding natural resource governance in Africa and proposes actionable solutions. One core issue is the lack of inclusive governance frameworks. State-centred models of resource management frequently marginalize local actors and traditional authorities, eroding trust and fostering resentment. To address this, inclusive and participatory governance structures must be institutionalized—ones that respect customary rights, integrate community voices, and promote equitable access.

Another challenge is the exploitation of resource wealth by political elites and armed actors. In many cases, resources such as diamonds, gold, or oil finance violence, enrich warlords, and undermine peace processes. Transparent mechanisms for resource revenue management—such as public audits, community benefit-sharing agreements, and anti-corruption watchdogs—are critical to curbing these trends. Additionally, empowering local civil society and media to monitor and report on resource governance can increase accountability and deter abuse. Furthermore, cross-border resource dynamics, such as shared rivers, forests, and mineral belts, often provoke regional tensions. Regional cooperation frameworks, backed by multilateral institutions, can help mitigate these disputes by facilitating joint resource management and benefit-sharing agreements.

Finally, academic and policy approaches must move beyond simplistic notions of “resource wars” and instead embrace context-specific analyses that account for historical grievances, identity politics, and governance failures. Research and policy should prioritize conflict-sensitive development models that align resource management with peacebuilding and social justice. In conclusion, while natural resources in Africa hold immense potential for economic development and state-building, their mismanagement and politicisation often serve to entrench conflict and inequality. Sustainable solutions require inclusive governance, regional cooperation, transparency, and a nuanced understanding of local realities. Only by addressing the deeper political and social roots of resource-related conflicts can these assets truly serve the public good.

## Keywords

Resource governance, Unequal access, Exclusionary policies, Warlords, Social justice



# Whose land is it anyway? – An evolutionary economics approach to land, institutions, and capital accumulation in Ethiopia, Ghana, and Tanzania

Zenebe Uraguchi

(Bern University of Applied Sciences, School of Agricultural, Forest, and Food Sciences, Zollikofen, Switzerland – [Zenebe.uraguchi@bfh.ch](mailto:Zenebe.uraguchi@bfh.ch))

This paper examines how land is governed, owned, and contested in three African countries: Ethiopia, Ghana, and Tanzania. It begins with a fundamental question: *Whose land is it anyway?* This question goes beyond formal land ownership, addressing the evolving roles of governments, traditional authorities, investors, and farmers/communities in shaping access to land, its use, and the distribution of benefits. While many studies approach land governance from a legal or policy reform perspective, this paper adopts an evolutionary economics lens to understand how land institutions change over time, adapt to pressures, and remain influenced by historical legacies.

Land governance in Africa is complex due to the coexistence of multiple systems. Statutory law may define ownership in one way, while customary practices tell a different story. Moreover, global investment trends, technological innovations such as digital mapping, climate change, and demographic shifts, including youth migration, are reshaping the valuation and control of land. The paper argues that land institutions are not static; they are shaped by history, strategy, and context. Understanding these dynamics requires examining institutional evolution, actor adaptation, and responses to change, beyond merely analyzing laws or policies.

The paper's central contribution is applying evolutionary economics to land governance. Unlike traditional economic theories that assume institutions are rationally designed for efficiency, evolutionary economics views institutions as products of incremental, adaptive, and often path-dependent processes, with change occurring over time in unpredictable ways. Four key concepts guide this approach:

First, *path dependency* explains how past choices shape the present, making certain land governance models resistant to change even under shifting conditions. Second, *critical junctures* are moments of disruption—crises, policy reforms, or external shocks—that create openings for new trajectories. Third, *institutional layering* describes the addition of new practices and rules to existing systems, resulting in hybrid arrangements. Fourth, *institutional conversion* occurs when existing institutions are repurposed to serve new objectives. These concepts clarify why land systems are often messy, overlapping, and resistant to simple reform.

The paper compares the land governance trajectories of Ethiopia, Ghana, and Tanzania. In Ethiopia, land has been publicly owned since the 1975 nationalization policy under the Derg regime. This framework was reaffirmed in the 1995 constitution and continues today under laws such as Proclamation 456/2005. The state plays a central role in land allocation, particularly for large-scale agricultural and infrastructure projects, offering administrative control but limiting local participation and smallholder security. Ethiopia exemplifies strong path dependency, as the system remains resistant to bottom-up change despite growing food insecurity and increasing competition for land.

Ghana follows a different trajectory. Land governance is largely decentralized and customary, with traditional authorities controlling approximately 80% of the land and overseeing allocation and dispute resolution. Over time, these roles have shifted: chiefs increasingly lease land to investors and respond to urban demand, illustrating institutional conversion, where old institutions adopt new economic functions. Ghana's 2020 Land Act and digital land registration reforms aim to formalize and harmonize a fragmented system, yet institutional layering persists, with formal and informal systems operating concurrently. This pluralistic system is flexible but vulnerable to elite capture and governance gaps.

Tanzania represents an intermediate case, with a dual system recognizing both customary and statutory rights under the 1999 Land Acts. Donor-backed programs such as the Southern Agricultural Growth Corridor of Tanzania (SAGCOT) have promoted land formalization and commercial use. Nonetheless, local communities still rely on

village-level institutions and face pressures from climate change, population growth, and declining agricultural productivity. Tanzania is at a critical juncture, where competing visions of land governance create tensions between central planning and local autonomy, producing fragmentation and uneven authority.

Beyond national differences, all three countries face broader pressures. Technological change is reshaping land registration, transfer, and contestation. Climate change alters land values and underscores the urgency of adaptive use. Demographic transitions, including rural youth migration and urban expansion, are transforming demand for land. Global interest in African land, driven by food security, energy, and infrastructure needs, interacts with national institutions in ways that either reinforce inequalities or open opportunities for inclusive governance.

This study offers a new analytical lens for understanding land governance. Rather than proposing technical solutions such as titling or market liberalization, it shows that land institutions are shaped by history, politics, and evolving actor strategies. The evolutionary approach explains why reforms often fail, why some systems persist despite pressure, and how change unfolds in complex and uneven ways. Asking “*Whose land is it anyway?*” shifts the focus from static ownership to the institutional processes that determine control and benefit. The findings suggest that effective land governance requires policies that are historically informed, context-sensitive, and capable of operating within layered, adaptive institutional systems.

### Evolutionary Institutional Dynamics in Land Governance

Concept	Ethiopia	Ghana	Tanzania
Path Dependency	Land nationalization in 1975 and state ownership enshrined in the 1995 Constitution persist. The state remains the sole allocator of land for both public and private investment, with limited local autonomy.	Strong customary authority over land persists from colonial indirect rule. Chiefs retain control over ~80% of the land. State legal frameworks have historically adapted to, rather than replaced, these structures.	Ujamaa policies and villagization laid the groundwork for village-based land governance. The 1999 Land Acts formally recognized this dual system, reinforcing both state and village claims.
Critical Juncture	Post-1991 transition to federalism and donor engagement opened space for land certification and digitalization, but the constitutional principle of state ownership remained unchanged.	Rapid urbanization, land commodification, and legal reforms like the 2020 Land Act represent a moment of possible institutional realignment, especially under digital land reform efforts.	Tanzania is at a critical juncture due to climate change, land scarcity, and external investment. Competing demands between large-scale agriculture and village land governance are reshaping the institutional balance.
Institutional Layering	First- and second-level rural land certification programs layered onto a state-owned system. Digital cadastral tools and the Land Administration Information System (LAIS) added new technical capacities but within an unchanged legal-political framework.	Statutory reforms (e.g., 2020 Land Act) and digital land administration systems are layered over strong customary practices. Chiefs remain dominant actors, creating a hybrid and often contradictory governance structure.	Land-use planning, titling, and donor-driven formalization programs coexist with customary practices at the village level. Multiple legal and informal rules operate simultaneously.
Institutional Conversion	The state retains formal control, but subnational actors (e.g., regional authorities, land bureaus) adapt centralized laws for local implementation. Certification enables new forms of individualized tenure within a socialist legal shell.	Chiefs convert customary roles into market-oriented actors by leasing land to private investors. Customary power is redirected toward commercial land management without losing its legal recognition.	Village institutions, while originally designed for local stewardship, are increasingly drawn into implementing investor-friendly reforms. Local authorities balance tradition with bureaucratic functions.

### Keywords

Evolutionary economics, Historical legacies (path dependency), Layered land systems, Turning points in land policy, Shifting roles of land authorities



#### WIFI CODE

Username: Gent – Free wifi

No password needed