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RESEARCH ARTICLE

Pluralizing archives for histories of extraction in Africa

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Abstract

With which sources can we write environmental histories of mining and oil drilling in Africa? Paradoxically, the pollution and environmental disruption caused by extractive industries are at once omnipresent and difficult to trace. In documentary evidence, multinational companies are hesitant to disclose the full extent of their polluting activities. In order to understand how people living around sites of extraction make sense of polluted rivers or suffocating smoke, we argue that archives need to be pluralized. State and company archives can fruitfully be paired with newspaper collections, oral history interviews, cultural production (songs, poems and literary works) and photography. Using examples from Johannesburg, Mazowe, the Central African Copperbelt and the Niger Delta, we map sources and methodologies that might be employed to grasp people's lived experiences of environmental change in localities of resource extraction.

Résumé

Avec quelles sources peut-on écrire des histoires environnementales d'exploitation minière et pétrolière en Afrique ? Paradoxalement, la pollution et les perturbations environnementales causées par les industries extractives sont à la fois omniprésentes et difficiles à retracer. Dans les données documentaires, les sociétés multinationales hésitent à divulguer l'étendue complète de leurs activités polluantes. Afin de comprendre comment les personnes vivant autour des sites d'extraction donnent un sens aux rivières polluées ou à la fumée suffocante, les auteurs prônent pour une pluralité consistant à associer archives publiques, archives d'entreprises, collections de journaux, entretiens d'histoire orale, production culturelle (chansons, poèmes et œuvres littéraires) et photographies. À l'aide d'exemples de Johannesburg, de Mazowe, de la ceinture de cuivre d'Afrique centrale et du delta du Niger, les auteurs cartographient les sources et les méthodologies qui pourraient servir à saisir les expériences vécues de changement environnemental dans les lieux d'extraction de ressources.

Introduction[1]

Resource extraction – in the form of giant mines, oil wells and their attendant pollution – is one of the foundational categories of the Anthropocene (Zalasiewicz, Waters and Williams 2014; Odell, Bebbington and Frey 2018). Mining and petroleum industries cause life-threatening toxicity and irreparably change landscapes and lifeworlds. Nonetheless, although resource extraction 'has perennially been one of the dirtiest of all industries', as Corey Ross (2017: 137) poignantly states, its role 'in transforming regional environments remains underexposed.' This observation is all the more perplexing as sites of mining and oil drilling, such as Johannesburg, the Niger Delta and the Central African Copperbelt, are among the best-studied localities in Africa (see Hecht 2023). The Zambian Copperbelt, for instance, has attracted attention from historians, anthropologists, social scientists and economists, who have studied issues relating to social change, gender relations, political mobilization and cultural production (see Larmer *et al.* 2021). The Niger Delta region has equally been the subject of copious scholarly production, with youth mobilization, violent conflict and relationships with the national state highlighted as core themes (see Obi and Rustad 2011; Adunbi 2015). This proliferation of academic studies relates at least in part to the richness of archives in and on these localities. Exceptional company, private and national archives have allowed scholars to recount detailed histories of resource extraction in places such as Mazowe, Johannesburg and Katanga (Money 2022). Yet, these collections rarely address the environmental impacts of extractive industries and they say even less about people's perceptions of living in these toxic environments (Peša 2023b).

In this article, we explore the lived experiences of environmental change in four localities of extraction in Africa, namely Johannesburg (South Africa, gold mining), Mazowe (Zimbabwe, gold mining), the Zambian and Congolese Copperbelt (copper mining) and the Niger Delta (Nigeria, oil drilling). While company archives, such as those of the Zambia Consolidated Copper Mines (ZCCM) in Ndola and the Gécamines archives in Lubumbashi, certainly contain clues on environmental regulations and pollution monitoring, engineers and mining investors rarely disclosed the full extent of their polluting activities (Peša 2022). What is more, the voices of people living around mines and oil wells are even less frequently captured in such official documents. Our article, therefore, argues that we need to broaden and pluralize our understanding of what 'the archive' is in order to understand the varied experiences of living amidst extractive environmental transformation – what Samuel Daly (2017) calls a 'broad and omnivorous approach.' As a first step towards this, we map company, governmental and private archival collections, alongside libraries, documentation centres and newspaper archives from which experiences of environmental change can be gleaned. To shed light on the 'alternative epistemologies' through which residents living around sites of extraction have made sense of environmental change, we furthermore seek archives that Africans have produced themselves (Mavhunga 2014: 25). In this vein, we highlight how oral histories, ethnographies, cultural production (in the form of literature, poems and

[1] An earlier version of this article was presented at the SCOLMA (UK Libraries & Archives Group on Africa) conference held on 23 June 2023 at SOAS University of London.

music) and photographs might be employed to write richer and more nuanced environmental histories of extraction in Africa.

Archives and documentary evidence

Indications of sizeable resource extraction in Africa date back to the first millennium CE, with gold mined in Mali crossing the Sahara and copper crosses from Katanga reaching both the Indian and Atlantic Ocean coasts. Yet at the turn of the twentieth century, large-scale industrial mining accelerated markedly. Diamond mines opened up in Kimberley in 1867, a continent-wide gold rush followed the discovery of gold deposits in Johannesburg in 1886 and copper mines commenced operations in Lubumbashi in 1906 (Peša 2023a). Injections of colonial capital and forms of coerced labour migration were elemental to enabling the development of these resource frontiers. Colonial investments and institutional support facilitated the development of mining and oil industries. Continuing after independence, resource extraction remained fundamental to postcolonial nation building and has opened up to truly global investments with neoliberal reforms since the 1990s (D'Angelo and Pijpers 2022). Industrial resource extraction – often highly capitalized and globalized – exists side by side with 'artisanal' mining. Robyn d'Avignon (2022) shows how the two are interdependent and cannot be easily separated: in Senegal, artisanal miners identified alluvial gold deposits that multinational companies are now mining industrially, whereas in South Africa *zama zama* artisanal miners are re-mining waste dumps left by decades of industrial mining. Resource extraction across Africa thus has long and complex histories (Davenport 2013).

It is irrefutable that extractive industries – both those managed by multinational industries and those initiated locally by 'artisanal' mineworkers and oil refiners – have left a profoundly toxic legacy over the last century. Mining and oil drilling have resulted in polluted air, water and soils and they have endangered human and more-than-human life, by killing fish, trees and crops. These effects are blatant and they have been condemned by academics, activists and artists as 'ecocide', 'necropolitics' and forms of 'wastelanding' (Mbembe 2003; Saro-Wiwa 2014; Voyles 2015). Extraction endangers not only the health and livelihoods of those directly employed in mining and oil industries, but of entire communities living around sites of gold and copper mining and oil wells. Yet, notwithstanding their ubiquity, the colonial and postcolonial histories of extractive toxicities are not easy to trace in documentary evidence. Mining and oil companies were and are still crucial to the survival of colonial and post-independence states. Touted as harbingers of 'development' and 'modernity', extractive industries long received preferential treatment from government officials (Ferguson 1999). In some cases, there was a direct relationship between government and company management. The power of the mining industry can be illustrated through the example of Katanga, where the Union Minière du Haut-Katanga (UMHK) formed 'a state within a state' and company agents were responsible for colonial administration. Just years after independence, in 1966, the mining industry was nationalized as Gécamines,[2] a company that still exists today (Dibwe dia Mwembu 2001). In this context, it is perhaps not surprising that issues of pollution

[2] Gécamines is an abbreviation for *La Générale des Carrières et Mines*.

and environmental harm have been largely invisibilized and silenced in colonial and postcolonial archives. While from the 1990s onwards Environmental Impact Assessments (EIAs) have encouraged public acknowledgement of pollution and have made environmental remediation plans mandatory, extractive industries can still conceal polluting activities by adapting thresholds of toxicity or by moving polluting activities elsewhere. EIAs have, therefore, been criticized by academics as forms of 'greenwashing' (Hilson and Murck 2000; Kirsch 2010). Toxicity is, thus, mediated by politicized regimes of perceptibility and imperceptibility (Murphy 2008). As the following examples will show, even when environmental harm and pollution were acknowledged as problems in archival documentation, extraction companies attempted to downplay the severity of these issues by framing risks in terms of economistic cost-benefit analysis and/or by proposing partial and simplistic techno-scientific solutions (Sluyterman 2010; Peša 2022). The politics of knowledge production, particularly in colonial/postcolonial contexts of deep power imbalances, oftentimes involved deliberately obscuring awareness of pollution, toxicity and hazard in archival repositories.

Still, documentary evidence can give us important clues for writing environmental histories of extractive industries. Elijah Doro and Marco Armiero (2023: 267) demonstrate how this approach of piecing together 'archival fragments' can shed light on the intersection of toxic pollution, capital and mining labour in colonial Southern Rhodesia. Through painstaking research in various archives, they document that, 'gold miners wantonly dumped their cyanide solutions into rivers, creeks, and other public sources of water supply, polluting and endangering river ecosystems.' Archival documents further highlight the racialized politics of the mining labour regime where white workers took up supervisory roles such as cyanide managers, while Africans occupied the role of 'cyanide boys' working in close contact with toxic chemicals. Doro and Armiero emphasize the lack of legislation to protect African mine workers from cyanide poisoning and show this through the use of photographs which depict the effects of toxicity, such as lung cancer. In this section, we explore which 'archival fragments' exist in Johannesburg, Mazowe, the Central African Copperbelt and the Niger Delta. How can company and state archives, as well as private collections and newspaper holdings, be deployed to grasp processes of environmental transformation spurred by mining and oil drilling?

Company archives

Several of the multinational companies now operating in African mining and oil localities were founded more than one hundred years ago. Prominent examples are the Anglo American Corporation (today Anglo American Plc) established in 1917 in Johannesburg, South Africa, the UMHK (today Umicore) established in 1906 in Lubumbashi, DR Congo and (Royal Dutch) Shell Plc which has operated in the Niger Delta of Nigeria since 1938 (Innes 1984; Brion and Moreau 2006; Sluyterman 2007). Not all of the archives of these companies are open to the public. Shell Plc, for example, restricts access to its documentation on the Niger Delta and so does Anglo American Plc (Sluyterman 2007; Ekberg and Brink Pinto 2023). Even researchers who apply months in advance and follow strict procedures are rarely granted access to these archives. Nonetheless, there are important exceptions, notably in Zambia and the DR

Congo, where the ZCCM archives in Ndola and the Gécamines archives in Lubumbashi, Likasi and Kolwezi contain a wealth of information about the mining industry. Because these mining companies ran paternalistic welfare services that included housing, medical care, education, leisure and welfare facilities, these archives 'contain much more information about everyday life on the Copperbelt than might be expected', as Duncan Money (2022) notes in his meticulous review of sources on the Copperbelt.

The ZCCM archives contain documentation from Rhodesian Selection Trust, Rhodesian Anglo American, the Northern Rhodesia Chamber of Mines and ZCCM itself (established in 1969 when the country nationalized its mines). These collections thus span the colonial/postcolonial boundary and a number of post-2000 sources have already been disclosed. Hyden Munene (2020: 359) asserts that the ZCCM collections provide invaluable data 'for understanding Zambia's mining industry' and that they 'make possible new questions and interpretations.' Meanwhile, the UMHK archives in Brussels mainly cover the colonial period, but they do contain correspondence on postcolonial trade and investment relationships. In 1966, the Congolese government nationalized its mines, merging them into one single holding company, Gécamines. Although the state of maintenance of these collections is very poor and applications to access the documents can take a few weeks to process, the Gécamines collections – divided over Lubumbashi, Likasi and Kolwezi – are a treasure trove for researchers (Peša and Henriet 2021; Piret 2015).

These mining archives contain thousands of files encompassing technical correspondence, annual reports and engineering bulletins, in addition to newspaper articles, information about the socioeconomic life of workers and trade union issues. Compared to economic and political topics, environmental references in this abundant documentation are relatively scarce. Nonetheless, by piecing together disparate files and mentions, a timeline of changing environmental thought among a diverse group of Copperbelt actors can be distilled. The ZCCM and Gécamines archives, for instance, contain reports on river pollution from the 1950s, air quality measurements from the 1970s and background documentation on EIAs from the 1990s (Peša 2022). By reading sets of annual reports of UMHK and Gécamines we can map when the discursive framing of environmental problems changed. In Gécamines annual reports, mention of 'occupational health and safety' issues started to be complemented by explicit discussion of environmental concerns from the late 1990s onwards. This, however, did not involve a qualitatively different understanding of the causes and consequences of pollution (Peša 2021). Several examples from Gécamines medical correspondence will show how the politics of archival knowledge production visibilized and invisibilized toxicity and pollution.

As part of their extensive paternalistic welfare policies, Gécamines directly employed doctors within the *Médecine du travail* department. Closely reading medical correspondence can provide more nuanced insights into how company officials understood health, safety and pollution. Gécamines' medical services archives, containing correspondence between workers, medical personnel and mine management, provide important glimpses of environmental history. Access to these archives depends on individual doctors who kept track of documentation and correspondence in office binders. This means that information is patchy and incomplete, but can occasionally be extremely rich. During research in 2018, Iva Peša encountered a

doctor in Likasi who was willing to provide access to his personal collection. This doctor had organized his correspondence meticulously, preserving letters to other doctors, Gécamines officials and patients, as well as medical reports and company circulars. From this correspondence, it becomes evident that Gécamines thoroughly researched the effects of mining-related professions on worker health. Doctors were aware of occupational diseases such as silicosis and lead poisoning, and they examined the effects of toxic substances (arsenic, cadmium and mercury) and heat exposure on workers' bodies (Dibwe dia Mwembu 1990). Yet during the 1970s and 1980s, mine management tried to superimpose a discourse of production onto medical and environmental issues. In some cases, work accidents and their causes were silenced to maintain production and maximize output. To mine managers, medical services and work safety measures served a legitimizing purpose, underlining 'the credibility of Gécamines as one of the principal motors of national progress' (GECLIK 1988). In determining environmental hazards and appropriate responses, *Médecine du travail* reports weighed worker health against productivity and profit. Gécamines direction proclaimed that medical services were designed to 'lead to an improvement in productivity' (GECLUB 1974). The activities of medical practitioners improved working conditions and worker health, but equally aimed to raise copper output by ensuring that workers would not 'lose' days of work (GECLUB 1982). Espousing this productivist attitude, a Gécamines doctor in 1974 recognized pollution as a cause of occupational diseases but still maintained that, 'to secure production, industries are obliged to accept these permanent risks' (Nzanga 1974). The medical department generated knowledge on health, disease and environmental risks, yet it suffered from a lack of independence from Gécamines management. Medical practitioners lamented that *Médecine du travail* 'does not have real budgetary or administrative autonomy', which 'hampers the elaboration of multidisciplinary projects in the interest of the worker and the company' (GECLIK 1988). In 1987, a doctor complained that at Gécamines there 'is a problem of mentality [as] each activity that is marginal to production', including medical services, 'is badly viewed' (GECLIK 1987). Despite their co-option into the productivist logic of mining companies, the correspondence of doctors does provide rare insight into health, safety and the framing of pollution from the perspective of healthcare workers as well as Gécamines management.

A very different type of company archive is housed at the University of Johannesburg. The Employment Bureau of Africa Ltd (TEBA) collections encompass the Witwatersrand Native Labour Association (WNLA or Wenela) papers.[3] Wenela was established in 1902 to recruit labourers for the South African mining industry from across Southern Africa, including from Mozambique, Zambia and Botswana. This collection contains information about all aspects of mineworkers' lives, as the recruitment bureau handled housing, health and benefits. Notably, the TEBA archives reveal crucial information about miners and their health, particularly in relation to the detrimental impact of mine dust. Not only did workers require medical screening before receiving their contracts, lung diseases such as tuberculosis, silicosis and pneumoconiosis were also monitored at the end of workers' contracts, before

[3] https://www.uj.ac.za/library/information-resources/special-collections/online-exhibitions/the-teba-collection/

returning 'home' (McCulloch 2009; McCulloch and Miller 2023). These records, however, primarily concentrate on the health of workers, revealing little about the effects of mining on workers' families or broader communities. While the TEBA documents show acute awareness of silicosis, they barely document the broader environmental consequences of mining activities. They offer only minimal insights into the communal experiences of populations residing around mines and mine dumps, for instance (Ndaba 2023). This archival omission makes it hard for researchers to grasp the health challenges within these broader communities. Overall, the TEBA archives focus on individual health impacts, particularly of workers, while overlooking other more extensive environmental aspects associated with mining.

Shell Plc produces 39 per cent of Nigeria's oil, making the company the largest regional oil operator. Its operations cover 30,000 km^2 and the company manages over 1,000 active oil wells and 6,000 kilometres of pipelines (Bayelsa State Oil and Environmental Commission 2023). Since the start of commercial oil production in 1956, an estimated thirteen million barrels of crude oil have been spilled, a shocking average of 240,000 barrels a year (Ordinioha and Brisibe 2013). These figures make the absence of consistent, reliable and transparent disclosure of oil spill and gas flare data particularly worrisome (Watts and Zalik 2020). Shell Plc has hardly made any archival materials on the environmental impacts of its six decades of oil exploration and production in the region available to the public. Only a handful of the EIAs of specific projects since 2014 are publicly listed.[4] This makes it problematic to ascertain the actual volume of oil spilled, its causes and the pollution that accompanies Shell Plc's activities. Oil spill data in Shell Plc's online database only dates back to 2013, with 'sabotage' listed as the main cause of spillage in the last decade. Moreover, when compared with data published by regulators, Shell seems to underreport oil spill volumes to reduce compensation claims and avoid liability for spills by attributing these to sabotage and third-party intervention. The non-availability of archival materials from Shell Plc and other oil multinationals on the environmental impacts of their activities and the non-transparent and conservative reporting of oil spills will continue to conceal the environmental and social costs of oil extraction in the Niger Delta. These deliberate archival acts of silencing are meant to evade responsibility for compensation claims, clean-up and remediation costs, and decommissioning. Internal official correspondence (if made public) and annual reports such as the Shell Plc *Nigeria Briefing Notes* provide at least some insights into extraction activities and their environmental footprints in the absence of access to a broader range of sources.

The politicized regimes through which toxicity and pollution have been visibilized or invisibilized become evident when assessing the documents available in company archives. While company officials frequently framed issues of pollution in terms of a cost-benefit analysis or by proposing partial technocratic fixes – in an attempt to evade liability and ensure long-run profitability – the documentation held in national archives and composed by government officials not directly involved in extractive industries might provide a different perspective on environmental dynamics.

[4] https://www.shell.com.ng/sustainability/environment/environment-impact-assessments.html

National archives

Archival records such as government documents, business correspondence, photographs, maps and newspapers are excellent sources of primary data for writing environmental histories of extraction. In this respect, the files contained in national archives provide a historical lens on environmental transformations and their effects on humans and more-than-human life forms (Welch 1999). The South African National Archives at Pretoria contain many files through which the historical environmental degradation of the Witwatersrand can be documented. Correspondence and documents about air and water quality issues, pollution and land disputes – some dating back to the 1930s – enhance our understanding of how enduring environmental vulnerabilities have been shaped, for example documenting the motives for siting Black communities next to mine dumps. These files, however, do not document the experiences of Black people who were moved to live next to mine dumps. To tap into their voices, oral history and alternative methodologies are indispensable. More problematically, the South African National Archives deliberately destroyed multiple state records documenting social experiences under Apartheid during the transition to democracy (Harris 2007). This act of erasure limits access to alternative viewpoints, notably those of communities living around mine dumps in Johannesburg.

The National Archives of Zimbabwe, established in 1935, contain numerous files on the political economy of mining in the colonial period. Existing scholarship has illustrated the changing economic, social, political and environmental dynamics of the mining industry in Southern Rhodesia using these files (Phimister 1975; Van Onselen 1980; Madimu 2017; McCulloch and Miller 2023). The collection ranges from Native Mining Commissioners' reports, reports from the Chamber of Mines, memoranda from colonial secretaries, executive council minutes and annual reports from the Chief Native Commissioner. While rich, these sources are most frequently written by colonial 'outsiders' and they remain relatively silent on the lived experiences of mine communities themselves. Furthermore, the National Archives of Zimbabwe have not been digitized, some files are in a poor state of maintenance due to lack of funding and access regimes to the archives can additionally make research challenging (Bishi and Muchefa 2022).

The documents dealing with Nigeria's Niger Delta region are split between the National Archives in Enugu and Ibadan. A creation of the British colonial government, the National Archives hold invaluable collections from the late 1800s to 1960. Dealing with oil exploration and extraction, the files housed at Enugu contain data from the colonial government, oil exploration companies and some records of community responses to oil extraction. The archives 'include records of the defunct Eastern region of Nigeria, provincial and district office records, records of ministries and parastatals, local government and native administration records, consular dispatches, protectorate administration and numerous intelligence reports on indigenous people and communities'.[5] Little is documented, however, in the archives on oil extraction and environmental transformation after Nigerian independence in 1960 (Daly 2017). Moreover, the files that are accessible are poorly preserved and in a dire state of

[5] Personal correspondence with MaryJoe Semajor, January 2024.

maintenance. The proposed Oloibiri Oil Museum and Research Centre initiated by the Nigerian Federal Government could provide alternative sources of archival collections and cultural production, more reflective of the lived experiences of Niger Delta people and their interactions with oil extraction and toxic environmental transformation.

Private collections

A broad variety of private collections exists that might complement more institutionalized and formalized archives. The collections that stand out, particularly, are NGO holdings, documents assembled in tertiary educational institutions and repositories of EIAs.

The severity of oil pollution and corresponding forms of environmental protest and litigation have increasingly made the Niger Delta a hub for NGO activity. Campaigning for environmental justice, organizations such as the Centre for Environment, Human Rights and Development and Environmental Rights Action/ Friends of the Earth Nigeria have foregrounded environmental advocacy, human rights, environmental clean-up campaigns and capacity building. In addition, NGOs engage in detailed environmental research across the Niger Delta. As this research is community oriented, it provides unique insights regarding the impacts of the oil industry on host communities. GIS-coordinated gas flare trackers and oil spill monitors, for instance, provide real time data on pollution incidents.[6] Moreover, these NGOs often have valuable repositories of research reports, policy briefs and news briefs in their offices. Although such reports rarely date back to before the 1990s, they contain much interview and ethnographic material that provides important historical clues on changing environmental consciousness. Such local level community-based data provides valuable insights into the lived experiences of fishers and farmers, women, children and the aged, groups most vulnerable to oil pollution.

Tertiary educational institutions and research centres in the Niger Delta provide further historical resources and data in the form of research reports, journals, archival material, newspaper publications, books, and oil company publications that are difficult to access elsewhere. Since its establishment in 1975, the University of Port Harcourt has been documenting the impacts of oil extraction on the Niger Delta environment through the scholarly production of its researchers. Unpublished PhD and MA theses, for example, are an excellent source, revealing knowledge production and pointing researchers to additional repositories through their bibliographies and reference lists. At the University of the Witwatersrand in Johannesburg, the *Wits Historical Papers* offer rare insights into the experiences of marginalized Black communities under Apartheid. These papers detail the evolution of townships in the Witwatersrand, shedding light on the politics behind urban planning decisions as well as providing snippets of daily life in particular townships (see Beall, Crankshaw and Parnell 2002). The *Wits Historical Papers* further house the collection of Earthlife, one of South Africa's earliest environmental NGOs, and correspondence from Anglo-American Plc.

In Zimbabwe, researchers can resort to the Zimbabwe Environmental Law Association (ZELA), the Centre for Natural Resource Governance (CNRG) and the

[6] https://gasflaretracker.ng/

Environmental Management Agency (EMA). The CNRG houses a wide range of digitized reports that analyse the political economy of mining in Zimbabwe. CNRG further publishes policy reports that address the impact of mining corporations on the environment. ZELA contains a wealth of documents in relation to mining legislation, environmental justice claims and resource governance. Government parastatals and watchdogs such as EMA (the institution also exists under the same name in Zambia) house (digital) collections of a wide range of environmental reports. Since the 1990s, new and existing mining activities are required to engage in comprehensive EIAs, assessing their environmental impacts and coming up with remediation and closure plans. The EMA is often referred to as a 'toothless bulldog', as it advocates for environmental justice on paper, yet often fails to implement a strategic action plan in terms of achieving environmental justice. Irrespective of its shortcomings, EIAs are a unique source of environmental data, measuring the levels of pollutants such as sulfur dioxide and lead, but also commenting on the socioeconomic consequences of mining and its environmental disruption (Spiegel 2017). Such resources are a useful starting point for engaging in debates about extraction and environmental transformation in Africa.

Newspapers

To trace the history of mining in the postcolonial period, newspapers are an invaluable source. In Zimbabwe, for example, there is the newspaper publisher, Herald House, where collections are organized into different categories and themes. Yet researching newspapers is a labour-intensive task, involving looking through individual issues page by page, searching for tidbits of useful information. Some newspapers are used for propaganda purposes, while state-owned newspapers might equally be biased in their reporting. This underlines the importance of source criticism when conducting newspaper research. Nonetheless, newspapers remain a fundamental source for tracing the changes and continuities of mining and environmental change. Ongoing digitization projects that attempt to make newspapers better accessible to a broader audience are therefore extremely welcome.

Certain South African newspapers are available in digitized formats. Our research examined the *Rand Daily Mail*, the *Financial Mail*, the *Sunday Times* and the *Sowetan*, from the 1950s until the present. Access to a keyword searchable database through Arena Holdings allowed us to zoom in on all mentions of 'mine dumps' in these newspapers. This yielded some surprising findings. Historically, Johannesburg's mine dumps have been prominent crime scenes (with numerous dead bodies found there and robberies and rape scandals taking place), they have figured as sports training grounds, sets for photoshoots (due to their resemblance to beach settings), aeroplane landing strips and even as a drive-in cinema. Newspapers also reveal the relationship between mine dumps and property development. Property advertisements for white South Africans strategically emphasize the distance from a mine dump as a selling point for homes and businesses. On the other hand, residential development for Black South Africans under Apartheid was often planned next to mine dumps, even as their toxicity was openly acknowledged. Mentions of residential development close to mine dumps therefore provide insight into social dynamics of Apartheid-era urban planning and allow us to trace how historical injustices developed. The effects of

Apartheid-era town planning reverberated after 1994. A 2007 article in the *Sowetan* commented that Khutsong, a neighbourhood built on active and disused mine shafts and suffering from severe subsidence and sinkholes, 'is not and never was suitable for human settlement' (Sowetan 2007). Khutsong was described as a 'tortured township', with houses earmarked for resettlement. As so often, however, resettlement was slow to materialize and residents are still living in Khutsong in 2024, subject to the same risks of subsidence. Such examples serve as a stark reminder of the deep-rooted biases and disparities that influenced environmental decision-making and affected the well-being of communities (Hecht 2023).

Newspapers are also an excellent source to show that environmental awareness and knowledge of toxicity is longstanding and widespread (Death 2016). To name just one example, a 2012 letter to the editor of the *Sowetan* complains about toxic dust in one of Johannesburg's low-income neighbourhoods:

> I am angry and frustrated with the people of Diepkloof, Soweto. ... Every year, from August to October, we are subjected to unbearable suffering because of the dust from the nearby mine dumps. Residents ... inhale the poisonous yellow dust, which affects our health. ... This is a yearly nuisance, but Diepkloof residents ... [mainly] complain ... nobody has yet suggested a plan of action to confront the mine dump owners (Mtimkuku 2012).

In the Niger Delta, where there are so few other documentary sources, newspapers equally provide a formative insight into environmental consciousness. In a 1982 article, the Association of Texaco Oil Spillage Victims comments on the inadequacy of compensation payments of twelve million naira. This was deemed 'grossly inadequate having regard to the enormity of the damage caused by the Spillage. ... Our lives and our means of livelihood were ruined, our whole economy became paralysed by the spillage of over 300,000 barrels of Crude Oil on our over 120 poverty-stricken villages and fishing ports round the Niger Delta' (*Nigeria Star* 1982). Through protest letters and the documentation of oil spills by local reporters, we gain valuable insight into the lived experiences of environmental devastation due to oil spills. Newspapers thus provide a rare opportunity to document changing environmental thought, including that of groups whose voices rarely feature in other archives.

Oral history

Despite the relative abundance of written sources on the history of mining and oil industries in Africa, these sources remain largely silent on the voices of ordinary people in frontiers of resource extraction – particularly when it comes to those not directly employed by mining or oil industries (Peša 2023b; Sloan and Cave 2023). Reflecting their experiences and narratives is an essential component that adds to highlighting the environmental transformation that accompanies extraction. Everyday stories of artisanal miners, women selling tomatoes and teachers living alongside oil pipelines cannot be found in the conventional archives – they are in the mines, in beerhalls and taverns, at the marketplace and *pa touchline* (a place where sex workers stand waiting for their clients). These are the *living* archives that can help researchers to understand the shifting experiences of people residing in toxic

landscapes of extraction (Shaba and Swart 2024). Spending time in such places provides in-depth nuances on class struggles, gender, power relations and occupational health much more extensively and dynamically than documentary research in archives can (see also d'Avignon 2022; Wiegratz, Mujere and Fontein 2022).

Oral history occupies a central role in bringing out the impact of mining and oil pollution on livelihoods. It allows researchers to document narratives of environmental transformation. Through oral history, particularly if paired with ethnographic research approaches, the researcher and interlocutors become intertwined as brokers and co-creators of knowledge. This decolonial approach, which overturns the idea of researchers speaking on behalf of 'research participants', can be used to deconstruct knowledge systems in histories of extraction in Africa (Shaba 2024). Oral history brings to life the realities of mining and oil communities. These narratives can be recovered through enquiring about the lives of miners and oil workers as well as their social and family networks. Oral history approaches have shed light on the adverse effects of mining toxicities in Mazowe district. Oral history unearths how men and women have been exposed to mercury, arsenic and cyanide, foregrounding the toxic tales of artisanal miners. In interviews, women labouring for incomes in artisanal gold mining in Mazowe narrated their lived experiences and how they handled toxic chemicals in mining frontiers. Due to the illegal nature of artisanal gold mining, women in Mazowe resorted to different strategies of evading confiscation of the gold they recovered. For instance, one woman stated that, 'after the amalgamation process, I would put the gold nuggets in my mouth.' Because of suspicion at gold mills, artisanal miners professed: 'We even swallow the amalgam, if we realize that someone wants to dupe you or when the gold output at the mill is not satisfactory.' As a way of hiding from violent machete gangs, some women also stated that they preferred burning the mercury inside their huts. But this adaptive practice also exposed them more directly to the toxic air which slowly *ate* its way into their health (Shaba 2024). Oral history thus brings to life the different visceral ways in which miners dealt with these chemical toxicities. In Mazowe, for instance, before consuming water from streams, women would use the inner fibers of trees, known as *rwodzi*, by throwing them in the water to test whether it is polluted. If the fibres changed colour, the water would be deemed contaminated. Through interviews, one learns that mercury had its own materiality, being considered a social being. Oral history approaches also comment on the ideographic language used by miners to bring out the deadliness of mining chemicals as well as ideas on gold mining, toxicity and pristine landscapes (see Doro and Armiero 2023). In essence, oral history affords an opportunity for historians to tap into microhistory and speak to the broader histories of extraction and environmental change.

Cultural production

Literature, music and the arts offer creative possibilities for looking at the world in a different light. Studying cultural production, we argue, can bring out elements of the lived experience of environmental transformation in localities of resource extraction. Novels, poems and songs uniquely enrich our understanding of social and environmental phenomena, as cultural production stems directly from lived realities.

Examining these diverse materials highlights communal consciousness and memories that are less prominent in archival sources (see Miller 2021; McBride 2023).

These arts-based environmental humanities approaches zoom in on 'questions of meaning, value, and ethics' that underlie processes of environmental change (O'Gorman *et al.* 2019: 427). In African localities, literature and popular music are promising yet underutilized sources for understanding environmental perceptions and responses (Caminero-Santangelo and Myers 2011). Ecocriticism scholars, who study the relationship between literature and the physical environment, have developed tools to analyse place, power, knowledge and representation (Nixon 2011; Ghosh 2016). Ethnomusicology, the study of music and songs in their social and cultural contexts, likewise illustrates perceptions of environmental change (Impey 2018). Literature and song shape and develop knowledge, imaginations, ideas and emotions about the environment, contributing to new narratives and frameworks of thought. Through such artistic expressions, 'some of the most creative and urgent perspectives on ecological change are generated' (DeLoughrey, Didur and Carrigan 2015: 13). Environmental humanities approaches clearly illustrate the entanglements between people, their environment and extractive industries. Yet Africanist scholars have barely started to take up these exciting interdisciplinary methodologies (Agbonifo 2014).

An evocative example is Peter Abrahams' 1946 novel *Mine Boy*, one of the first books to comment on the condition of Black South Africans in Johannesburg's gold mines. In one passage, Xuma, the protagonist, depicts the formation of a mine dump:

> And one little truck after another loaded with fine wet white sand, was pushed up the incline to where a new mine-dump was being born. But as fast as they moved the sand, so fast did the pile grow. A truck load would go and another would come from the bowels of the earth. And another would go and another would come. And another. And yet another. So it went on all day long. On and on and on and on. . . . It was this that frightened Xuma. This seeing of nothing for a man's work. This mocking of a man by the sand that was always wet and warm; by the mine-dump that would not grow; by the hard eyes of the white man who told them to hurry up. It made him feel desperate and anxious. (Abrahams 1946: 42)

This excerpt highlights the exploitative conditions of mine labour, its repetitiveness and arduousness, the racialization of mine labour with white supervisors and Black menial workers, but it also crucially comments on the environment-making process of mining. The construction of the mine dump is portrayed in much detail, with sensory descriptions of the 'wet and warm' sand. Furthermore, the frustration with the never-ending work of moving sand causes feelings of desperation and anxiety in Xuma, illustrating how environmental transformation might trigger emotional and political reactions as well. In short, this 'first modern novel of black South Africa' contains important clues as to how gold mining was experienced by the workers who lived through Johannesburg's mining boom.

As Karen Barber (2017: 3) notes, 'cultural forms not only emerge out of historical change, but also participate in it, embody it and comment upon it.' We therefore examine how cultural expression has imagined and portrayed specific resource

extraction environments and, in particular, how these cultural representations have evolved historically. Literature and popular music provide important sources for understanding environmental perceptions. Popular culture offers unique insights to study environmental history, as it gives meaning to 'new historical experiences' which 'emerge from everyday life on the ground' (Barber 2017: 2). Nigeria and South Africa, in particular, have rich literary sources on environmental change, for example, Ben Okri, Tanure Ojaide and Ken Saro-Wiwa in Nigeria and Peter Abrahams, Mongane Wally Serote and Uhuru Portia Phalafala in South Africa (see Hofmeyr 1978). Localities of resource extraction have also produced varied musical cultures, commenting on environmental change. Olusegun Stephen Titus (2017) has studied environmental references in Nigerian popular songs, including Fela Kuti's description of oil's despoliation of the Niger Delta environment. South African examples are songs such as 'Shosholoza', Johnny Clegg's 'African Sky Blue' and Ladysmith Black Mambazo's album *Phansi Emgodini* (*Down in the Mines*). Literature and music permit insights into emotions, imaginations and ideas in ways quite distinct from archival research or oral history (Allen 2012). Cultural expression provides a commentary on socio-environmental change and is produced by a specific historical context, which makes it amenable to historical analysis (Coplan 2008; Impey 2018).

Tanure Ojaide's poetry, informed by the Niger Delta environment and its interaction with oil drilling, powerfully speaks to themes of environmental transformation. In particular the poem 'When green was the lingua franca' (Ojaide 1997) captures feelings of environmental deterioration and mental, even spiritual, upheaval:

My childhood stretched
one unbroken park,
teeming with life.
In the forest green was
the lingua franca ...
Then Shell broke the bond
with quakes and a hell
of flares. ...
Explosions of shells to under
mine grease-black gold
drove the seasons mental
and to walk on their heads. ...
Now I commune with ghosts
of neighbours and providers
whose healing hands of leaves
and weeds have been amputated.

In addition to these examples, there are works of popular culture that speak to themes of environmental transformation. Nigerian Afrobeats star, Burna Boy, produced a song and documentary about his home town, Port Harcourt, and how oil pollution – black soot in particular – affected its inhabitants. Titled 'Whiskey' (2022) the lyrics assert that:

> Because of oil and gas, my city so dark
>
> Pollution make the air turn black
>
> Every man have to stay on guard

Zambian rapper Pilato, who is known for his razor-sharp political commentaries, produced the song 'Ku Kopala' ('On the Copperbelt') in 2022. Similar to Burna Boy's 'Whiskey', the song merges interviews with lyrics to capture stories of toxicity and suffering due to mining pollution.

> We have the copper and the mines ...
>
> [Still] There are many things that can kill us ...
>
> We are suffering because of an investor ...
>
> When you see a river, it may have chemicals
>
> Government I am asking that you look into this
>
> I struggle to understand this, it hurts

One of the women interviewed in the video clip asks, 'Is this how Zambians should live?', suggesting that irrespective of the wealth that copper mining might bring, the sacrifices it demands – in the form of pollution, toxicity and dispossession – are severe. Adding sources such as music, literature and photography can, thus, illustrate lived experiences of environmental transformation caused by mining and oil drilling that might otherwise remain out of sight.

Photography

Photography can visually illustrate the links between creative imagination, extraction and memory. The inclusion of photography in our research repertoire adds an indispensable visual dimension to the research, enabling the documentation and illustration of the daily realities experienced by individuals residing in close proximity to sites of extraction. In Johannesburg we used existing works of photography, such as Jason Larkin's (2013) *Tales from the City of Gold* and David Goldblatt's (1973) *On the Mines*, to trigger interviewees to engage in forms of remembering the past. Pierre-Philippe Fraiture (2024: 140) argues that considering the intersection of extraction and art 'allows for a multi-perspectivist examination of the way in which memory of the past ... has been archived, experienced, transformed, manipulated, and (mis)interpreted.' Photography allowed us to examine questions of temporality and memory of a sometimes painful past. Images served as

Figure 1. Diepkloof (Johannesburg) mine dump. Photograph by Madoda Mkhobeni 2023.

evocative prompts, inviting participants to share their insights, memories and personal connections to the visual narratives. This approach revealed the power of visual stimuli in recollection and allowed interlocutors to provide context and meaning to the images.

For instance, when exploring old pictures of the city of Johannesburg, interlocutors were invited to reflect on how they saw and experienced the city during different historical periods. The photographs acted as windows to the past, eliciting vivid stories and recollections of the city's evolution, growth and transformation. Participants recounted their personal narratives of Johannesburg's past, offering a poignant insight into the changing urban landscapes and the experiences of those who called the city home.

Jamie Murton (2019) asserts that environmental historians 'are missing out by not taking photographs more seriously', as integrating photography in our methodologies can 'enrich our understanding of people's relationships to built and natural environments'. For this reason, we are engaging in collaborations with practising photographers, such as Madoda Mkhobeni in Johannesburg. By adopting participatory photography methods, Mkhobeni's photographs engage in visual ethnography and bring out surprising visual links between municipal and mine waste (see Figure 1) – highlighting how residents around mine dumps can feel wasted in several ways (Armiero 2021). Interlocutors emphasized feeling neglected by the state and condemned to living in unhealthy and largely toxic circumstances. By using these photographs as conversational prompts, we can elicit deeper layers of environmental consciousness and reflection.

Conclusion

This article has sought to foreground promising methodologies and approaches to highlight lived experiences of environmental change in localities of resource extraction. Following Macarena Gómez-Barris (2017: xiv), we sought to foreground a 'submerged viewpoint', by suggesting 'ways to see what lies in the ecologies all around us' and 'how to perceive those things that are not usually available to the naked eye'. While we surveyed mining and oil company archives, as well as state archives, newspaper collections and private repositories, we concluded that written documents offer only a partial view on how the environmental transformations spurred by mining and oil extraction are experienced by those living with these changes on an everyday basis. To get a fuller picture, archives need to be pluralized. That is why we explore oral history methodologies, cultural production and photography, as these sources can bring out 'less perceivable worlds, life forms, and the organization of relations within them' in the extractive zone (Gómez-Barris 2017: xv). By listening to songs about air pollution, by engaging in conversations about photographs that show the environmental effects of mining and by walking across an oil spill site, the lived experiences of environmental transformation caused by resource extraction move centre stage.

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