

## **Unearthed: Bauxite Mining in Jamaica as Ecocide**

Tameka Samuels-Jones<sup>1</sup>

---

<sup>1</sup> Tameka Samuels-Jones is Assistant Professor and Associate Director of the Centre for Research on Latin America and the Caribbean, York University.

## **Introduction**

Jamaica is internationally renowned for its vibrant tourism industry and potent Blue Mountain coffee. However, less well known is a primary Jamaican export that has become one of the mainstays of the island's economy - bauxite, the raw material from which aluminum is produced. Bauxite may not be as well-known as Jamaica's tourism or coffee, but it is more widely consumed globally. Bauxite is a rock which is mined out of the land and further refined into aluminum using caustic soda and lime. Aluminum is then used for siding and windows in houses, to make electrical appliances, pots and pans, kitchen foil, and more. As a highlight of aluminum's strategic importance - 80 percent of an airplane's weight is accounted for by the metal.

In spite of aluminum's importance, the means by which this important mineral is obtained – mining, is fraught with problems and contradictions. Bauxite mining is an extractive industry which causes significant environmental harm. Mining operations entail sacrifice by residents and communities - especially those whose territories have been converted into mining concessions - as well as sacrificing the environment. Upstream to downstream, the bauxite mining industry evicts residents and communities from their land, pollutes water and air, destroys ecologies and demolishes crop areas. The lifecycle of mining leaves behind degraded territories and deadly pit sites, beginning prior to exploration and lasting long after the operation ends. These harms can never fully be accounted for, its victims are poorly remediated and the corporate perpetrators are usually unscathed. Behind the mosaic imagery of development through bauxite mining promoted by the Jamaican government (GOJ) are real, rural communities under siege by mining companies which have been granted licenses by state institutions complicit in this ecocide.

Using the Stop Ecocide Foundation's Independent Expert panel's human rights approach to ecocide, this paper explores the accountability gaps that may be filled through an international crime of ecocide. By using the environmental injustices caused by bauxite extraction in Jamaica as a case study, the paper explores the severe, long-term harms which meet the conditions of an environmental crime, and which should meet the conditions of an international crime of ecocide perpetrated by multinational corporations.

## **Capitalizing on Colonialism - A Brief History of Bauxite Mining in Jamaica**

The origins of Jamaica's bauxite-alumina industry can be traced to the 1940s, when North American aluminum corporations incorporated Jamaican bauxite into the globalized maze of mines, refineries, and smelters. The island's proximity to North America, along with the availability of suitable sites for ports, made it ideal for investment in this mineral. By 1957, Jamaica was the world's largest producer of bauxite and this provided a powerful symbol of a world beyond the plantation, particularly for the first generation of nationalist leaders in Jamaica. The penetration of the aluminum companies marked the shift from the economic ties of British colonialism in Jamaica to North American domination. A closer look at the capitalist world's aluminum industry reveals the enormous power of the forces confronting Jamaica in its attempt to gain greater control over its natural resources. Even as the primary bauxite players changed over the decades, the industry has remained a tightly knit oligopoly.

Almost in sync with the industry's beginnings, Jamaican farmers became aware of the potential harm to their environment, and began to sign petitions, write letters to newspapers, and hold community meetings to discuss and contest the effects of bauxite mining on their communities. Their concerns were well founded. By 1990 mining had caused extensive damage to the natural ecology of at least 60,000 acres of rural land. At the same time, more than 200 million tons of caustic red mud was produced by that time. This harm was compounded by the unfavorable government revenue on each ton of bauxite mined which ironically, incentivized the state's desire for expansion in production and heightened environmental degradation.

The areas in Jamaica where bauxite is mined are mostly located in territories inhabited by rural and Indigenous populations that have been historically marginalized. Mine sites affect ecosystems which are important as a source for community livelihood, biodiversity, and are key in regulating the climate. However, the delicate ecosystem is eroded as the bauxite refineries spew particulate matter containing silica, iron, nitrate oxide, carbon dioxide and other toxins into the air, and the trains and trucks that transport the bauxite and alumina also add to the pollution. Locals living within a ten-mile radius of the factories suffer from increased health problems, in particular respiratory problems such as asthma, sinus infections and allergies. Residents also complain of eye and skin ailments and autoimmune illnesses.

Further, previously productive agricultural lands have been replaced by gouges, pits, scarred landscapes, sink holes, vast chasms, and wastelands with a thin veneer of topsoil. The mining has resulted in pits left open after decades because *technically* there is still bauxite in them that can be extracted. In one large mined out pit covered by concrete, there is a mass grave of people whose graves were audaciously in the way of miners and were therefore dug up and moved.

While these disastrous impacts should easily lead to compensation for the victimized and severe criminal penalties for the transnational perpetrators, alas, this has not been the case. The GOJ has never tracked or kept records of the public health effects of the industry, and the common practice for community members who complain of illnesses is to be sent to mining company affiliated doctors who naturally lack impartiality. The impacts on workers exposed over long periods of time is likely even worse than those of community members, and there are anecdotal stories of early deaths to cancer. What then are the legal remedies for these environmental injustices?

White (2013) notes that the social construction of legality and illegality plays a significant role in the study of environmental harm. From a criminal justice perspective; this explains why the concept of environmental crime is consistently under-valued in law. Environmental law as a body of law is a relatively new concept. Prior to the 1960's, some of the issues now dealt with in environmental law were governed by the laws concerning nuisance. It does not help that as the law in this area has developed, it has been viewed as "white collar crime". White collar crime is sometimes viewed as a "victimless crime" and is significantly underreported. This treatment of environmental offences has affected the way it is viewed in international law and in the domestic laws which implement treaty provisions prohibiting environmental harm.

In relation to bauxite mining, it makes sense that the need to prevent harm but encourage the underlying productive activity is the reason for this "tipping point of illegality". As posited by Cohen (1991), it is important that the law does not operate to "over deter" corporations engaged in the underlying activity. At the end of the day commerce is meant to facilitate and foster development. The regulatory framework should not cripple that endeavor. This challenge has led to the compartmentalization of environmental risk: specific events or incidents attract sanction, whereas wider legislative frameworks may set limits on other environmentally harmful practices while permitting them to continue (White, 2013), as is the case with bauxite mining in Jamaica.

The critical question is: are the adverse effects caused by bauxite mining in Jamaica harmful to the extent that they should be “criminal?” Lin (2006) defined “environmental harm” as “a setback to human interests that community norms have deemed to be significant.” In White’s (2011) view however, “harm” in the context of environmental crime is “an actual danger or adverse effect, stemming from direct and indirect social processes, that negatively impinges upon the health and well-being and ecological integrity of humans, specific biospheres and non-human animals”. White’s definition is wider than Lin’s and contemplates harm to non-human life forms. However, one may argue that if such harm to non-human life forms is to be criminalized it is presumed that it must result in some injury to the public at large or is abhorrent to the public (human) interest on some level as well. The necessity of linking this kind of harm with protecting human interests is perhaps of more importance in developing countries like Jamaica. Otherwise, state policymakers may not see the need to channel money and resources into curtailing such harm as justifiable. Yet with these challenges in mind, should local harms by multinational corporations become a matter for the international criminal justice system?

This question may be best considered by referring to White (2013) who posited that:

- a. Wrongdoing is often perpetrated by states themselves, yet it is nation-states that define what is criminal, corrupt and unjust. Therefore, it is necessary to develop definitions of crime by which crime can be measured outside the restrictiveness of state laws and are more universal in nature. This is particularly relevant in the context of transnational crime in which the offending jurisdiction seeks out locales with less rigid environmental protection laws than that of their own country.
- b. Harms perpetrated by powerful organizations, such as transnational corporations, are most often dealt with by the state using civil rather than criminal remedies. This reflects the capacity of those in power to shape laws that do not criminalize their activities, despite their outcome. (White, 2013)
- c. The concept of environmental harm cannot simply be bound by an economic-based analysis.

The Jamaican case highlights the extent to which governments and state institutions remain wedded to the dominant neoliberal extractivism development model, which offers access to

resource for extraction at the expense of its environmental health. Further, through local regulations the capacity of the state to regulate environmental impacts resulting from bauxite mining, are in this instance not absent, but are largely weak and ineffectual when faced with the opportunity for foreign direct investments.

### **Playing Dirty: The Environmental Impacts of Bauxite Mining**

One of the main impacts of the bauxite-alumina industry on public health in Jamaica has been its effect on air quality. PM10 and PM2.5 are the main particulate matters (PM) that have been observed within the vicinity of bauxite activity. Bauxite dust is classified as a “nuisance dust,” consisting of coarse particles that compromise environmental amenity, damage machinery, decrease visibility, or act as an irritant substance, is transported by the wind from excavation, blasting, and transport. “Nuisance dust” is generated by tailings facilities, stockpiles, waste dumps, and haul roads. Exhaust emissions arise from mobile sources (cars, trucks, heavy equipment) and gases from fuel combustion and mineral processing.

PM10 and PM2.5 include inhalable particles that are small enough to penetrate the respiratory system and their health impacts are well documented. According to the World Health Organization (WHO), there is no “safe level” for PM10 and PM2.5, and PM2.5 (fine particles) presents a stronger risk factor than PM10. Exposure to both PM10 and PM 2.5 can cause emphysema, pneumonia, tuberculosis, cancer, acute respiratory distress syndrome (ARDS), respiratory distress syndrome, pulmonary oedema, and asthma. Diseases such as these, which result in reduced oxygen being delivered to the tissues of the human body, can result in damage to every major organ. Other air pollutants, such as sulphur dioxide, cause corrosion to building materials, including “zinc” roofs, soiling of personal property (such as clothes hung out to dry) and damage to crops and vegetation.

Residents who live in close proximity to bauxite mining areas, residue disposal areas (mud lakes), haul roads and processing facilities frequently and consistently complain of asthma in children, allergies, damage to roofs, contaminated water supplies, damaged personal property, lack of soil fertility, impacts on crops, noxious smells, and dust. Communities have also contested the amount of compensation given for so-called “nuisance dust,” how it is distributed and to whom, and also cite the industry’s failure to keep reparative promises.

One privately funded 2007 study in Jamaica which investigated the pattern of selected reported respiratory illnesses in these communities at specified intervals within a 10-kilometre radius of the same bauxite mining plant found that:

- The average levels of PM10 exceeded the national acceptable average of 50µg/m<sup>3</sup> at one to six miles from the bauxite processing plant. An excess of PM2.5 was observed within a one to ten-mile radius.
- 37 percent of adults and 21 percent of children living within six miles of the facility suffered sinusitis. Asthma afflicted 23 percent of adults and 26 percent of children. Allergies were markedly more prevalent among those who lived closest to the plant than in control groups.
- Particulate Matter (both PM10 and PM2.5) measured within the study area contained alumina and sodium particles which were both associated with bauxite mining and processing.
- The incidence of eczema, hives/rashes, asthma, allergic conjunctivitis, hay fever/allergic rhinitis, wheezing, headache, eye symptoms, cough, shortness of breath, Body Mass Index (BMI) and hypertension were also investigated and these incidences were found to be heightened as a result of the close proximity to mining sites.

The harm caused to these Jamaican communities is obvious, and the argument surrounding the international criminalization of practices which cause such harm may be required for the protection of human and environmental health.

### **Whither an International Crime of Ecocide?**

With respect to developing sanctions for the harms caused by bauxite mining companies in Jamaica, criminal justice practitioners must consider several factors. Firstly, governments often place corporate and personal interests over the citizens of their jurisdictions based on the extent to which corporate profits may be translated into investment dollars. Therefore, they cannot be solely relied upon to protect their citizens locally from environmental crime at the hands of transnational corporations.

Further, traditional crimes are clearly defined legally, but an argument for labelling adverse environmental impacts by transnational companies a crime may lack support based on its often-abstract nature. At present, in addressing this contentious issue, scholars and policymakers often consider one of two extremes - the enactment of a ban or treaties. However, a proposal to address this crime must be considered within reason. Even if the international community succeeded in implementing a mining ban on transnational corporations that cause consistent and significant environmental harm in developing countries, these countries will still remain vulnerable to other related activities. Therefore, unless effective global machinery is in place to control and manage transnational mining companies, populations in these countries will remain vulnerable to other, similar harms. At the other end of the spectrum, is the continued use of “soft laws” imposed by international treaties, which have little deterrent value, particularly in the face of the huge financial returns to be gained globally from mining. Historically, civil penalties and moral suasion have not proven to be much of a deterrent in preventing corporate crime.

Accordingly, an argument for the introduction of ecocide as the fifth crime under the jurisdiction of the International Criminal Court would be well supported based on the recommendation of the Stop Ecocide Foundation’s Independent Expert Panel<sup>2</sup>, convened in late 2020. This panel, comprised of twelve international lawyers from diverse backgrounds, defined *ecocide* as:

*“unlawful or wanton acts committed with knowledge that there is a substantial likelihood of **severe** and either **widespread** or **long-term** damage to the environment being caused by those acts.”*  
[emphasis added]

Using this definition, the environmental harm being caused by multinational bauxite mining companies in Jamaica would meet the conditions for ecocide if this was enacted into international law. The definition of “*wanton*” used by the Independent Panel for the purpose of their report is reckless disregard for damage which would be clearly excessive in relation to the social and economic benefits anticipated. As with traditional crimes that are premeditated and result in

---

<sup>2</sup> The Independent Expert Panel for the Legal Definition of Ecocide convened by the Stop Ecocide Foundation issued its Commentary and Core Text in June 2021. Available at <https://static1.squarespace.com/static/5ca2608ab914493c64ef1f6d/t/60d1e6e604fae2201d03407f/1624368879048/SE+Foundation+Commentary+and+core+text+rev+6.pdf>



serious harm and death, ecocide in the case of the bauxite industry is in fact, “*wanton*” with significant evidence of its impact which should serve as precedence.

Further, according to the Independent Panel, “*severe*” refers to damage which involves very serious adverse changes, disruption or harm to any element of the environment, including grave impacts on human life or natural, cultural or economic resources. As has been highlighted throughout this paper, bauxite extractive mining has had an insidious long-term effect on Jamaica’s environment. The most visible impacts during mining include the removal of agricultural vegetation or native forests, the elimination of mineral-bearing soils, and the physical reshaping of the landform. These changes have impacted the processes which drive the geo-biological formation of new soils, regulate microclimates (e.g. air temperature, relative humidity), and govern the movement of water within and beyond the mining area (e.g. how rainfall is locally intercepted and channeled to the surface; subsurface penetration, water storage, catchment outflow).

“*Widespread*” is defined by the Independent Panel as damage which extends beyond a limited geographic area, crosses state boundaries, or is suffered by an entire ecosystem or species or a large number of human beings. In a country as small as Jamaica, with a population of 3 million people across 10,991 km<sup>2</sup>, even a comparatively “limited geographic area” elsewhere would represent the entire country of Jamaica in terms of its impact. Therefore, while bauxite mining occurs in the central and western portions of the island, the entire island is impacted by the migration of dispossessed farmers to the urban core - where there is no farmland, the displacement of Indigenous Maroon communities from their land and symbolic and cultural artifacts, and the additional burden to the island’s skeletal healthcare system.

To further advance the case for ecocide - on July 16, 2005, an abandoned, “remediated” bauxite mining area became a watery grave for five Jamaicans when rains from Hurricane Emily battered the island<sup>3</sup>. Ironically, the bauxite mine which was dug thirty-years prior to this incident, was certified as restored and rehabilitated despite the continued erosion and glaring red mud tailings which remained. This is because of the nature of bauxite mining which renders the land so deteriorated that efforts at restoration are usually futile. The Independent Panel defines “*long-*

---

<sup>3</sup> MiningWatch Canada, September 7, 2005. <https://miningwatch.ca/categories/company-country-issue/country/latin-america-and-caribbean/jamaica>

*term*” damage as that which is irreversible, or which cannot be redressed through natural recovery within a reasonable period of time. As evidenced by the loss of life noted above which was subsequent to remediation efforts, the environmental costs of bauxite mining meet this condition. Further, according to a report from the Jamaica Environment Trust<sup>4</sup>, people from a mining community in St. Ann spoke of the topsoil put back as remediation as “. . . *too shallow to sustain vegetable crops,*” while for others involved in the farming of sweet potatoes, “. . . *the best in the world,*” were said to have taken a blow. Thin soil, also, is unable to “. . . *resist heavy rainfall,*” leaving pasture growth vulnerable. Often, farmers said, there was a failure to properly spread topsoil. Instead, “. . . *after two to three years you might be able to rear a few goats and cows on the grass, but fruit trees are all gone – their roots need deeper soil.*”

The implementation of stringent international environmental law with punitive and criminal sanctions for deterring and punishing ecocide is ideal. International criminal law already sanctions acts that cause widespread and severe damage to the environment during wartime. It seems absurd that the same policy should not apply during peacetime. As has been illustrated, the harm from bauxite mining is glaringly obvious and is being carried out on the basis of perceived benefits and costs.

### **Conclusion – When Ecocide comes Home to Roost**

An emphasis on widespread or long-term damage to the environment, cannot be adequately measured *by law* without also examining the negative impact this damage has on human beings. After all, the environment is in many ways a voiceless victim, without the ability to demand pecuniary awards and/or criminal prosecution. The Independent panel’s proposed definition of ecocide therefore rightly captures both the ecocentric and anthropogenic nature of environmental harm. Yet, though ideal, it must be noted that international criminalization presents its own challenges. Any kind of criminalization at the international level requires transnational compliance with the existing treaties and protocols and co-operation between nation states. The work of urging compliance is being carried out by the Implementation and Compliance Committee of the Basel Convention, which was established in 2002 under Article 15, paragraph 5 (e) of the Convention. The mandate of the Committee includes: (i) the implementation and compliance with specific

---

<sup>4</sup> <https://www.jamentrust.org/new-publication-red-dirt/>

obligations under the convention, (ii) providing training for customs officials, and (iii) providing technical and monetary assistance for member states. The work of the Committee provides an answer to some of the challenges which developing countries such as Jamaica face. The provisions in particular for technical support for testing of hazardous waste from bauxite mining could assist with enforcement efforts.

In addition, greater mechanisms for the exchange of information between signatories is crucial for prompt prosecutions and the establishment of watch lists for offenders. This may be done through Multilateral Memorandums of Understanding for the provision of mutual assistance through information sharing. The Basel Secretariat also assists with the timely reporting of incidents by states. This would result in the Secretariat notifying affected countries and assisting with the resolution of incidents.

Further definitional issues concerning the meaning of “environmental crime” must be addressed at the treaty level and in the domestic legislation. It should be clear what activity is being prohibited. This kind of clarity must also engender harmonization in enacting legislation among signatories. Enactment (and harmonization) of course, necessitates the political will to implement the provisions of the Basel Convention. This will require agreement in the perception of the nature of environmental harm among nation states.

Also, a major concern within the criminal justice arena is what entity will monitor and enforce adherence to transnational environmental law? Currently, INTERPOL provides information to support the work of prosecutors of environmental crime internationally. INTERPOL also has the framework for monitoring and enforcing environmental harm by corporations through its operational tools and services for cross border intelligence gathering and analysis. It further appears that INTERPOL already recognizes its role in fighting crime in this area. As aptly stated by the former Executive Director of Police Services of Interpol, Jean-Michel Louboutin:

*Environmental crime worldwide in all its forms represents a serious threat to the world's global security, ecosystems and economy. It represents one of the fastest-growing crime area, fanned by expanding crime networks, profits, and weak criminal penalties.” He further noted that “the fight against environmental crime must involve collective efforts by law enforcement, governments, international organizations and the private sector. (2013)*

Despite the development of such enforcement and sanctioning mechanisms, there remains however the issue of sovereignty which is of paramount importance in establishing who has jurisdiction with respect to prosecuting crime. International criminalization is not likely to be subsidiary to domestic forms of criminal law. Here opponents of criminalizing environmental by transnational corporations would argue that this proposition would impose on the ability of local jurisdictions by internationalizing issues that could be handled just as well domestically. Yet there is evidence that some countries, such as Jamaica may lack that will or ability and, in these instances, enforcement by an international court would be most effective subsequent to an investigation by an international policing body such as INTERPOL.

The transnational market facilitated by globalization will generally bring economic benefits; but most of these same activities carry potential health and environmental problems with them. This is because at the heart of extractivism and the current neoliberal development model is the predatory exploitation of the world's vulnerable people and nature. Despite the challenges to implementation it is more urgent than ever that through international law, alternatives to this destructive model of resource extraction, and capitalist accumulation, are championed, and greater emphasis placed on the preservation of human and environmental life instead of commodities for profit.

## Citations

Baldwin-Jones, A. E. (2011). *The Jamaican Marronage, a Social Pseudomorph: The Case of the Accompong Maroons*. Columbia University, PhD Dissertation.

Barclay L. A. & Girvan N. (2013). Transnational Restructuring and the Jamaican Bauxite Industry: The Swinging Pendulum of Bargaining Power. In R. S. Gendron, M. Ingulstad, & E. Storli (Eds.), *Aluminum Ore: The Political Economy of the Global Bauxite Industry* (pp. 238–267). University of British Columbia Press.

Beckford, G. (1987). The Social Economy of Bauxite and Jamaica. *Social and Economic Studies*, 36 (1), pp. 1–55.

Berkaak, O. A. (1983). Re-settlement and dislocation of small farmers in ALCOA's mining areas in the Mocho Mountains of Jamaica. *Journal of Peace Research* 20(3), 227–237. <http://www.jstor.com/stable/423795>

Charles, P. (2007). *The Reported Respiratory Illnesses in Communities within the Parish of Clarendon, and its Association with Environmental Conditions, Particularly Bauxite Activity*. Kingston: The University of the West Indies.

Claude Davis & Associates. (2006). *Natural Resources Conservation Authority Ambient Air Quality. Guideline Document (National Environment and Planning Agency)*. Jamaica. Retrieved from <http://nepa.gov.jm/regulations/air-ambient-guideline-2006.pdf>

Claude Davis and Associates. (2020, August 20). *Technical support document for the regulatory impact analysis for air quality regulations* developed by the National Environment and Planning Agency. Prepared for National Environment and Planning Agency (NEPA) with support from the Canadian International. Retrieved from RIAS-Final-Report-Technical-Support-Document-for-RIAS: <https://www.nepa.gov.jm/regulations/RIAS-Final-Report-Technical-Support-Document-for-RIAS.pdf>

Cohen, M. A., American Law and Economics Association. Annual meeting, Marine Policy and Ocean Management Center (Woods Hole Oceanographic Institution), & Vanderbilt University. Owen Graduate School of Management. (1991). Environmental crime and punishment:

Legal/economic theory and empirical evidence on enforcement of federal environmental statutes. Nashville, Tenn: Owen Vanderbilt University, Owen Graduate School of Management.

Connell, R. (2017). *The Political Ecology of Maroon Autonomy: Land, Resource Extraction and Political Change in 21st Century Jamaica and Suriname*. Berkeley University, PhD dissertation.

Crawford, A., Davis, N. and Bliss, M. (2020). *IGF Mining Policy Framework Jamaica June 2020*. *Intergovernmental Forum on Minerals, Metals and Sustainable Development*, Ottawa, Canada. Retrieved from <https://www.iisd.org/publications/igf-mining-policy-framework-assessment-jamaica>

Di Carlo, E., Chen, C. R., Haynes, R. J., Phillips, I. R., & Courtney, R. (2019). Soil quality and vegetation performance indicators for sustainable rehabilitation of bauxite residue disposal areas: a review. *Soil Research* 57, 419–446. <https://www.publish.csiro.au/SR/pdf/SR18348>

Donoghue AM, F. N. (2014). “Bauxite Mining and Alumina Refining: Process Description and Occupational Health Risks”. *J Occup Environ Med*, 512–517.

Drakopoulos, Y. (2018). *The Evolution of Bauxite Mining in Jamaica – Modern Challenges for a Mature Industry*. Travaux 47, Proceedings of the 36th International ICSOBA (The International Committee for Study of Bauxite, Alumina & Aluminium) Conference, Belem, Brazil. <https://icsoba.org/assets/files/list-of-papers-2018/bauxite-papers-2018/BX05%20-%20The%20Evolution%20of%20Bauxite%20Mining%20in%20Jamaica%20-%20Modern%20Challenges%20for%20a%20Mature%20Industry.pdf>

Davis, C. (1989). *Jamaica in the World Aluminum Industry, 1938–1973*. Jamaica Bauxite Institute.

Dressler, J., & Thomas, G. C. (2006). *Criminal Procedure: Principles, Policies, and Perspectives*. West Academic.

Environmental Law Alliance Worldwide. (2010, July). *Overview of Mining and its Impacts*. Retrieved from <https://www.elaw.org/files/mining-eia-guidebook/Chapter1.pdf>

Figueroa, E. (2019a, July 28). Cockpit Country Still Under Threat from Bauxite Mining. *Jamaica Gleaner*, retrieved from <http://jamaica-gleaner.com>

Figueroa, E. (2019b). *Fly Me to the Moon*. Kingston, Jamaica. 114 mins.

Fincham, A. G. (1997). *Jamaica Underground: The Caves, Sinkholes and Underground Rivers of the Island* (2nd ed.). The Press, University of the West Indies.

Girvan, N. P. (1991). Economics and the Environment in the Caribbean: An Overview. In N. P. Girvan, D. Simmonds (Eds.), *Caribbean Ecology and Economics* (pp. xi–xxiv). Caribbean Conservation Association.

Greenberg, W. A. & Wilding, L. P. (2007). Pre- and post-mined bauxite soils of Jamaica: physical and chemical properties. *Soil Science Society of America Journal* 71(1), 181–188. <https://access.onlinelibrary.wiley.com/doi/full/10.2136/sssaj2004.0382>

Hague, M. and Fletcher, R. (2002). Globalization, Labour Markets and Empowerment of the Global South:

Hammelmann, H. A. (1956). *The Proof of Guilt. A Study of the English Criminal Trial.*

Harris, M. A. & Omoregie, S. N. (2008). Post-mining deterioration of bauxite overburdens in Jamaica: storage methods or subsoil dilution? *Environmental Geology* 54: 111–115. <https://link.springer.com/article/10.1007/s00254-007-0798-3>

Holness, A. (2017). Statement by the Most Honourable Andrew Holness, Prime Minister to Parliament on the delimitation of the boundary of the Cockpit Country and the Cockpit Country Protected Area on Tuesday, November 21, 2017. <http://go-jamaica.com/pages/cockpit/files/assets/basic-html/page-1.html>

Homero Silva, L. H. (2015). *Strengthening the Capacity of Jamaican Communities to Protect their Environmental Rights. Health Survey of the Mining Communities of Ten Miles, Bull Bay, St Thomas & Hayes & New Town, Clarendon Control Communities of Albion, St Thomas & Lionel Town, Cla.* Kingston.

Hyslop, E.J. & Nesbeth, D. A. (2012). The effects of bauxite/alumina waste on the composition of the macro-invertebrate community of the Rio Cobre, a major river in Jamaica. *Biota Neotropica* 12(2), 33-39. <http://www.scielo.br/pdf/bn/v12n2/v12n2a04.pdf>

INTERPOL-UNEP conference aims to develop global roadmap against environmental crime. <https://stopillegalfishing.com/press-links/interpol-unep-conference-aims-to-develop-global-roadmap-against-environmental-crime/>

Jamaica Bauxite Institute. Jamaica's Bauxite/Alumina Production – (MT).  
<https://jbi.org.jm/project/production/>

Jamaica Environment Trust (2007). *It Inna Di Law. A Guide to Jamaica's Environmental laws*. Kingston, Jamaica.

Jamaica Environment Trust (2015). *Get Up, Stan Up. A Guide Book on Laws and Rights Relating to Mining and Quarrying in Jamaica*. Kingston, Jamaica.

Jamaica Environment Trust (2017). *Review of the Legal and Policy Framework for Air and Water Quality in the Island of Jamaica*.

Jamaica Environment Trust (2020). *Red Dirt: A Multidisciplinary Review of the Bauxite Alumina Industry in Jamaica*. Kingston, Jamaica.

Lin, A. C. (2006). The unifying role of harm in environmental law. *Wisconsin Law Review*, 2006(3), 897.

Lynch, M. J., & Stretesky, P. (2001). Toxic crimes: Examining corporate victimization of the general public employing medical and epidemiological evidence. *Critical Criminology*, 10(3), 153-172.

Montague, P. The Pesticide Failure. 1996. *Rachel's Environment and Health Weekly*, #482. Online. Accessed April 12, 2015

National Minerals Policy 2010–2030. Ministry Energy and Mining, 2011. Retrieved from [http://www.caribbeanelections.com/eDocs/strategy/jm\\_strategy/jm\\_minerals\\_policy\\_2010.pdf](http://www.caribbeanelections.com/eDocs/strategy/jm_strategy/jm_minerals_policy_2010.pdf)

NEPA-JBI MOU 2013. Agreement between Jamaica Bauxite Institute and Natural Resources Conservation Authority and The Chief Executive Officer of the National Environment and Planning Agency, April 2013. Received from NEPA.

Parker, Michael. (2009). Categorizing Environmental Crimes: Malum In Se or Malum Prohibitum. *Texas Environmental Law Journal*, (40), 93-111

Persaud, S. D. (2018). *Approaches to Bauxite Residue Legacy Issues in Jamaica*. Jamaica Bauxite Institute, Kingston, Jamaica.



Sachak, N. (1987). The Impact of Land Acquisition by Bauxite-Alumina Transnational Corporations on Peasants in the Bauxite Land Economy. *Social and Economic Studies* 36(1), 93–135.

Sheller, M. (2000) *Democracy After Slavery: Black Publics and Peasant Radicalism in Haiti and Jamaica*. University of Florida Press.

Sprague, J. (2015). From international to transnational mining: the industry's shifting political economy and the Caribbean. *Caribbean Studies* 43(1), 73–112. <https://www.jstor.org/stable/24706390>

Storli, E. (2013). The Global Race for Bauxite, 1900–1940. In R.S. Gendron, M. Ingulstad, and E. Storli (Eds.), *Aluminum Ore: The Political Economy*, 107–137. University of British Columbia Press.

Stretesky, P. & Long, M. & Lynch, M. (2014). *The treadmill of crime: political economy and green criminology*. Abingdon, Oxon: Routledge

Sutherland, E. H. (1949). *White Collar Crime*, New York: Holt, Rinehart & Winston.

Tappan, P. W. (1947). Who is the Criminal? *American Sociological Review*, 12(1), 96–102. <https://doi.org/10.2307/2086496>

White, R. (2011). *Transnational Environmental Crime: Toward an eco-global criminology*, London Routledge

White, R. (2013). *Environmental harm: An eco-justice perspective*. Bristol: The Policy Press.

Williams, C. J. (2004, November 7). *Ill Jamaicans Putting Blame On Bauxite-Alumina Industry*. Washington Post.

Wilson, N. (2019) NEPA, “Winalco Heads To Court Today Over Rio Cobre Fish Kill – Environmentalists Want Agency To Collar More Companies Over Breaches”. <http://jamaica-gleaner.com/article/lead-stories/20191126/nepa-winalco-head-court-today-over-rio-cobre-fish-kill>

Witter, M. (2019, September 22). Cockpit Country: Needless Yu Sell Yu Brekfus Fi Buy Yu Dinna. *Jamaica Gleaner*, <http://jamaica-gleaner.com>