

Social and Environmental Effects of Extractivism

By Sean Phipps, MICLA, 2014

The history of both Canada and Latin America has been in many ways defined by extractivism, with European colonists keen to exploit the natural resources of the region for their own benefit, often at the expense of both the land itself and its original inhabitants. Despite formal independence in the 19th century and the growth of modern capitalist economies, in much of Latin America and increasingly Canada as well the same problems of resource dependence and export orientated extractivism persists. For many communities, resource extraction is an integral part of their history, while in others its an entirely new phenomenon as companies expand to previously unexploited areas or new technologies and growing demand make new forms of extraction possible. In both cases the presence of resource extraction (in this paper minerals and hydrocarbons) poses serious environmental risks, as well as affecting the social fabric of the communities themselves.

Environmental Effects of Mining

The environmental effects of mining myriad with impacts varying depending on what mining techniques are employed (open pit, tunnel mine, hydraulic) and the level of regulatory oversight. This report provides a summary of the most important environmental concerns and their potential effects on human health.

Water

- **Water Shortage:** Mining is an extremely water intensive activity with large scale open pit mines using hundreds of litres of water a second to process ore.¹ This can lead to serious conflicts with local farmer, especially in water stressed areas, as vast quantities are rediverted to met the needs of the mine.²

1 "Proyecto minero Cerro Casale." *INDH*.

2 Bebbington and Williams. "Water and Mining Conflicts in Peru." *Mountain Research and Development*. Vol. 28:3/4.

- Acid Mine Drainage: A modern open pit mine requires the removal of millions of tonnes of waste rock, rock often rich in sulfides.³ Upon exposure to water and oxygen, the sulfides in these rocks are metabolized by a variety of bacteria, accelerating the oxidization of metals in the rock lowering the pH.⁴ This acidic runoff can lead to the leaching of heavy metals into the water supply, seriously affecting the health of the surrounding ecosystems and the communities that depend on them.⁵
- Waste Disposal: The development of an open pit mine entails the creation of vast quantities of waste in the forms of waste rock, contaminated water and toxic chemicals used during ore processing. Contaminated water is often impounded in tailings ponds however, the risks of leaching and overflows still exist particularly in areas of high rainfall.⁶ Other risks include the sedimentation of rivers due to increased erosion from mining activities, and chemical spills, particularly cyanide.⁷

Land use

- Soil Contamination: The toxic runoff from mining operations, along with contamination from windblown dust can have serious effects on soil quality.⁸ As well erosion from road building and deforestation can further reduce the amount of arable land available to farmers, further affecting traditional livelihoods.^{9 10}
- Geographic Footprint: Open-pit mining is an extremely land intensive activity, with the footprint of a large mine such as Newmont's Yanacocha project totaling 1554 km².¹¹

Emissions

3 Akcil and Koldas. "Acid Mine Drainage (AMD): causes, treatment and case studies." *Journal of Cleaner Production*. Vol. 14.

4 *Ibid.*

5 *Ibid.*

6 "Overview of Mining Impacts." *Guidebook for Evaluating Mining Project EIAs*.

7 *Ibid.*

8 *Ibid.*

9 *Ibid.*

10 Moran. "Mining Environmental Impacts-Integrating an Economic Perspective." *CIPMA*.

11 "Yanacocha Mine." *Infomine.com*.

- **Air Quality:** Mining operations can have a significant impact on air quality, generating large amounts of dust affecting crop production, increasing the prevalence of smog and increasing the risk of respiratory illnesses.¹² As well many of these dusts may have high levels of arsenic, nickel, lead, cobalt and mercury, increasing their toxicity.¹³
- **Greenhouse Gases:** Mining is also a significant contribute of greenhouse gas emissions, with an average copper mine producing 1.9 megatonnes of CO₂ a year.¹⁴

Environmental Effects of Oil and Gas: Tar Sands and Shale Gas

Water

Water impacts for oil and gas extraction are very similar to those related to mining, with tailings ponds leaks, acidification of water bodies due to nitrous and sulphurous emissions and high levels of water impacting local ecosystems.^{15 16} In the Athabasca Tar Sands in particular, leaching from tailings ponds has been a key concern, with leeching rates as high as a million litres a day, which many analysts have linked to rising cancer rates in downstream communities such as Fort Chipewyan.¹⁷ Shale gas extraction also affects local watersheds, with hydraulic fracking posing serious risk of methane contamination of groundwater, as well as improper disposal of waste water.¹⁸

GHG

Consumption of hydrocarbons is by far the largest source of greenhouse gas emissions and the largest driver of anthropogenic climate change, with the extraction process itself forming an important secondary source of emissions. The Tar Sands currently account for 5% of Canada's total greenhouse

12 Moran. "Mining Environmental Impacts-Integrating an Economic Persoective." *CIPMA*.

13 *Ibid.*

14 Haque and Norgate. "Energy and greenhouse gas impacts of mining and mineral processing operations." *Journal of Cleaner Production*.

15

Martínez. "¿Cuánto debe Texaco a Ecuador" *SERVINDI*.

16

Carter. "Regulating the Environmental Impacts of Alberta's Tar Sands." *Buffet Centre*.

17 *Ibid.*

18

"Safety First, Fracking Second." *Scientific American*.

gas emissions,¹⁹ however, they are anticipated to provide between 41 to 47% of new emissions.²⁰ As stocks of conventional oil decline, the growth of tar sands and shale gas operations are set to expand.²¹ Despite claims that it is a cleaner alternative (natural gas does burn cleaner than say coal), shale gas extraction releases huge quantities of GHG's, mainly in the form of methane a greenhouse gas 25 times more potent than CO₂, albeit with a shorter residence time in the atmosphere.²² In total shale gas extraction produces 33 grams of CO₂ equivalent per megajoule of energy, compared to 24 grams for coal production.²³

Extractive Communities: Company towns, dependence and closures

Economic dependence

Traditionally extractive projects have provided a number of relatively well-paying jobs, serving as an important economic draw, with some communities such as Val d'Or owing their very existence to resource extraction. However, the lack of economic diversity in most extractive-based communities can lead to high levels of dependency and little in the way of viable alternatives.²⁴ Resources such as minerals and oil are ultimately finite, with their prices determined by international markets beyond the communities' control, leading to little in the way of stable long term development.²⁵ As well, once a community becomes defined by resource extraction, it becomes harder for them to resist new projects, regardless of the environmental concerns. During the debate over the development of Osisko's mine in Malartic, it was argued by some in the town that the region's economic history of mining left them with little option but to accept the project if their community was to survive.²⁶ Finally, for many new more intensive forms of extraction, such as open pit mining, very little labour is required and often demands

19 Gosselin et al. "Environmental and Health Impacts of Canada's Oil Sands Industry." *The Royal Society of Canada*.

20

Carter. "Regulating the Environmental Impacts of Alberta's Tar Sands." *Buffet Centre*.

21 Klare. "The Third Carbon Age." *The Nation*.

22 Francoeur. "Le gaz de schiste serait aussi polluant que le charbon." *Le Devoir*.

23 *Ibid.*

24 Schuldt y Acosta. "Petróleo, Rentismo y Subdesarrollo ¿una maldición sin solución?" *Nueva Sociedad*.

25 *Ibid.*

26 "Pour un développement responsable de nos ressources: Non aux «méga» mines à ciel ouvert." *Audiences publiques du BAPE projet de mine d'or à ciel ouvert Canadian Malartic de la corporation minière Osisko*.

qualifications which many community members, especially in the global South, lack, further reducing the economic benefit of the mine.²⁷

Social conflict

- Violence and Public Health: Ever since its earliest days, the boomtown effects of resource extraction have been associated with a number of social problems such as increased violence, crime, alcoholism and drug addiction, a pattern which continues in many communities today.²⁸ In a 2010 Royal Society of Canada report, the authors noted in Fort McMurray a number of negative effects on public health as a result of the nearby tar sands, primarily housing shortages, increased drug and alcohol rates, higher crime rates, and inadequate public health services.²⁹ In particular the presence of a temporary and primarily male workforce, is associated with increased levels of prostitution, sexually transmitted infections and violence towards women.³⁰

31

- Erosion of traditional practices: Particularly in regions with large indigenous populations, the arrival of an extractive economy can have serious affects on traditional customs and livelihoods. The geographer Jeffrey Bury gives once such example of the Yanacocha mine, where indigenous community members where pressured by the mining company to give up their traditional collective property regime to one of individuals titles, which the company could then buy up.³² Extraction can also seriously disrupt the ecosystems which people depend on³³ and further increase the need to leave the community, eroding the social fabric.³⁴
- Fly in/Fly out: In many parts of Canada the extractive community is becoming a thing of the

27 Moore. "Mitos y realidades de la minería transnacional." *DESLINDE*.

28 *Ibid*.

29 Gosselin et al. "Environmental and Health Impacts of Canada's Oil Sands Industry." *The Royal Society of Canada*.

30 Moore. "Mitos y realidades de la minería transnacional." *DESLINDE*.

31 Karl., "Oil-Led Development: Social, Political, and Economic Consequences." *CDDRL*.

32 Bury. "Mining mountains: neoliberalism, land tenure, livelihoods, and the new Peruvian mining industry in Cajamarca." *Environment and Planning*.

33

Martínez. "¿Cuánto debe Texaco a Ecuador" *SERVINDI*.

34 Moore. "Mitos y realidades de la minería transnacional." *DESLINDE*.

past, as companies looking for more flexible labour arrangements, are increasingly choosing to fly workers in and out instead. The practice has been criticised for reducing investment in nearby communities, reducing the spillover effects to other parts of the region's economy and creating little in the way of durable jobs, infrastructure and social programs, to the point that in Australia where many of the first fly in/fly out programs started, they are now known as the “cancer of the bush”.³⁵

Who Benefits?

This is the ultimate question of extractive economies. As far as company's are concerned the answer is everyone with projects providing jobs for local community members, while providing foreign investment and development for the country as a whole. What to make of these claims? Schuldt and Acosta argue that economic growth from extractives is an impoverishing growth with most resource dependent economies (with the notable exception of some Middle Eastern kingdoms) experiencing little in lasting economic development.³⁶ Rather, governments become dependent on revenue from extraction, increasing levels of corruption and foreign domination of the economy.³⁷ Whats more, for many new forms of extraction, such as open pit mining, the labour demands are relatively low and the skill level required quite high, restricting the number of jobs available for community members.³⁸ Ultimately the most lasting effect of extraction is the presence of unused mines and degraded landscapes. In Quebec it is estimated that since 1990, the government has spent over \$40 million restoring abandoned mine sites, with another \$264 million predicted to be spent in the next 10 years.³⁹ Currently mining companies have to pay 70% of the costs of clean up, with the government covering the extra 30%, however, there exists little in provisions if the company goes bankrupt or can't pay, leaving the Quebec government with the bill.⁴⁰

35 Storey. “Fly-in/Fly-out: Implications for Community Sustainability.” *Sustainability*.

36 Schuldt y Acosta. “Petróleo, Rentismo y Subdesarrollo ¿una maldición sin solución?” *Nueva Sociedad*.

37 *Ibid.*

38 *Ibid.*

39 “Pour que le Québec ait meilleure mine.” *Ecojustice*.

40 *Ibid.*

Bibliography

1. Akcil and Koldas. "Acid Mine Drainage (AMD): causes, treatment and case studies." *Journal of Cleaner Production*. Vol. 14. 2006.
2. Bebbington, Anthony and Mark Williams. "Water and Mining Conflicts in Peru." *Mountain Research and Development*. Vol. 28:3/4. 2008.
3. Bury, Jeffrey. "Mining mountains: neoliberalism, land tenure, livelihoods, and the new Peruvian mining industry in Cajamarca." *Environment and Planning*. 2005.
4. Carter, Angela V. "Regulating the Environmental Impacts of Alberta's Tar Sands." *Buffet Centre*. 2010.
5. Francoeur, Louis-Gille. "Le gaz de schiste serait aussi polluant que le charbon." *Le Devoir*. February 2012. <http://www.ledevoir.com/environnement/actualites-sur-l-environnement/342299/le-gaz-de-schiste-aussi-polluant-que-le-charbon>
6. Gosselin, Pierre et al. "Environmental and Health Impacts of Canada's Oil Sands Industry." *The Royal Society of Canada*. 2010.
7. Haque N. and T. Norgate. "Energy and greenhouse gas impacts of mining and mineral processing operations." *Journal of Cleaner Production*. Vol. 18. 2010.
8. Karl, Terry L. "Oil-Led Development: Social, Political, and Economic Consequences." *CDDRL*. 2007.
9. Klare, Michael T. "The Third Carbon Age." *The Nation*. August 2008. <http://www.thenation.com/article/175659/third-carbon-age>
10. Martínez, Esperanza. "¿Cuánto debe Texaco a Ecuador?" *SERVINDI*. 2004.
11. Moore, Jen. "Mitos y realidades de la minería transnacional." *DESLINDE*. Vol. 44. 2009.
12. Moran, Robert. "Mining Environmental Impacts-Integrating an Economic Perspective." *CIPMA*. 2000.
13. Schuldt, Jürgen and Alberto Acosta. "Petróleo, Rentismo y Subdesarrollo ¿una maldición sin

- solución?” *Nueva Sociedad*. August 2006.
14. Storey, Keith. “Fly-in/Fly-out: Implications for Community Sustainability.” *Sustainability*. 2010.
 15. “Pour un développement responsable de nos ressources: Non aux «méga» mines à ciel ouvert.” *Audiences publiques du BAPE projet de mine d’or à ciel ouvert Canadian Malartic de la corporation minière Osisko*. April 2009.
 16. “Pour que le Québec ait meilleure mine.” *Ecojustice*. 2013.
 17. “Overview of Mining Impacts.” *Guidebook for Evaluating Mining Project EIAs*. 2010.
 18. “Proyecto minero Cerro Casale.” *INDH*. 2012.
 19. “Yanacocha Mine.” *Infomine.com*. January 2014.
<http://www.infomine.com/minesite/minesite.asp?site=yanacocha>
 20. “Safety First, Fracking Second.” *Scientific American*. November 2011.
<http://www.nature.com/scientificamerican/journal/v305/n5/full/scientificamerican1111-12.html>