Curbing gold mining in Choco, Colombia

Kamaladevy Sivalingam, M.D.P., University of Minnesota
Ksivlalingam415@gmail.com
(646) 961 5118
1400 S 2nd St Apt. B-311
Minneapolis, Minnesota 55454

Introduction

Colombia has a range of temperatures due to a variety of geographical features and long coast lines, from deserts to swamps, to snowy mountain tops and extended grass plains.[1] In recent years the government policies have been pro industry growth with a push for urbanization at the expense of the livelihoods of people living in more rural areas and of lesser income.[2] The lack of economic opportunity and of jobs in rural areas lends for employment under the table in illegal activities including the mining of natural resources and minerals.[3] This problem is compounded with the political conflict in Colombia and historical terrorism of the Armed Revolutionary Forces of Colombia (FARC)[4] who displaced people in rural areas from their lands to establish greater power across the country. The lands stolen by the FARC were under their jurisdiction until the peace accord was signed in 2016. In the towns, FARC captured, taxes were paid to FARC in exchange for people's safety. The FARC also took over the small-scale local mines in these areas, and warred over control of the gold-rich areas with other militant groups.[5]

Choco Colombia, which is tropical rainforest is one of the most biodiverse regions in the world today and yet there are constant threats to its existence.[6] With 63% of the population of Choco living in poverty[7], the FARC, and other militant groups have put locals, indigenous people, and illegal immigrants to work for a "misery wage"[8] on illegal mining sites.[9] There are high levels of corruption in misappropriation of funds and illegal mining that come at great human costs.[10] Around 80% of the gold produced in Colombia is from illegal mines[11] and the highest

---

[1] *Magia Salvaje.* Directed by Mike Slee. Colombia, 2015. DVD.

[2] Programa de las Naciones Unidas de Colombia. *Colombia rural Razones para la Esperanza.* Bogotá, Colombia, 2011.

[3] Acensio Melo, Diego. *La Minería en Choco en Clave de Derechos*. Bogotá, Colombia: Tierra Digna, 2016. http://tierradigna.org/pdfs/LA%20MINERIA%20EN%20CHOCO_web.pdf

[4] For more information on FARC terrorism, please see: Libertad Digital. n.d. "El terrorismo de las FARC en cifras." Accessed 31st of July 2017. http://www.libertaddigital.com/internacional/latinoamerica/2016-09-26/las-farc-en-cifras-1276583283/.

[5] Centro Nacional de Memoria Histórica. *Guerrilla y población civil. Trayectoria de las FARC 1949-2013.* Tercera edición. Bogotá, Colombia, 2014.

[6] El Tiempo. n.d*. "Nuevos desiertos avanzan detrás de la fiebre del oro"* Accessed 30th of July 2017. *http://www.eltiempo.com/archivo/documento/CMS-16460299*

[7] El Tiempo. n.d. "*Las cifras que tienen indignado al Choco."* Accessed 30th of July 2017. http://www.eltiempo.com/colombia/otras-ciudades/las-cifras-que-tienen-indignado-al-choco-28264

[8] El Tiempo. *"Nuevos desiertos avanzan detrás de la fiebre del oro"*

[9] El Tiempo. *"Nuevos desiertos avanzan detrás de la fiebre del oro"*

[10] El Tiempo. *"Las cifras que tienen indignado al Choco."*

[11] Mining. 2015. "About 80% of Colombia's gold output comes from illegal miners — Gov't" Accessed 4th of March 2016.

concentration of mines is in Choco (40,870 acres).[12] This paper addresses the means to tackle the multifaceted problem of illegal mining with measures at the national level that could bring benefits to populations living in Choco. While there are plenty of best practices to address illegal mining, the paper will zoom in on the practices that could offer the most promises for people of low-income who depend on the resource rich land for their subsistence and the practice of mining for their livelihoods.

The best practices suggested are to; (1) Enforce a Pathway to Legalization (2) Limit Mercury Contamination (3) Use GPS to detect mining sites (4) Fund Non-profit and Community Based Organizations (to support small scale and artisanal mining) and to (5) Tax Large Scale Mining Companies. These practices range from means to reduce the amount of environmental degradation in the mining areas to addressing the systemic poverty and lack of opportunity of informal workers on mining sites. They draw on experiences from countries across the globe and within the Colombian borders. The take away from the research is that practices must be adaptable to the local context, i.e. be within the scope of the priorities and interests of the government of Colombia in the post-conflict era.

Best Practice 1: Enforce a Pathway to Legalization

The first practice to consider is enforcing a pathway to legalize small-scale mining. Mining in Colombia and in Choco, is a part of the livelihood of Afro-descendent and indigenous populations that have a cultural and historical right to the land. Even so, the government deems their practices "illegal" because they haven't solicited permits. Small-scale or artisanal miners feed river mud through a sieve, filtering out the gold and throwing out the waste. Meanwhile armed groups and companies use bulldozers and powerful motors to suck up the gold from the ground, wiping out entire plains.[13] The two cannot be scrutinized under the same lens because while the former has a light footprint on the earth, the latter's practices are damaging to the ecosystems that exist in Choco as a whole.[14]

Governments across the globe are promoting legalization of artisanal mining because areas that are rich in gold and other minerals will continue to be rich in these minerals with or without the presence of small-scale miners. This means there will always be an economic incentive to mine the area, and once small-scale or artisanal miners are pulled out, armed groups, paramilitary forces, and companies can continue to perform the same task but at a greater cost to the environment. When looking to address illegal mining, it's critical to comprehend the negative externalities that could come with replacing one form of mining with another.

In this vein, the government of Peru has signed agreements with gold mining communities across the country to curb illegal practices. In 1999, the government signed an agreement with the Malinowski community living in the southern part of country, Madre de Dios where there is a predominantly Qhechua speaking low income population that depends on mining for subsistence. Since the impacts of their small-scale mining process were a lot lower than the impacts of corporate mechanized mining, they could continue mining but restricted to the borders of the Tambopata Reserve. They formed the Apaylom association, an environmentally motivated alliance with the central government, agreeing to use small motors for their mining pumps, to stay

---

[12] El Tiempo. *"Nuevos desiertos avanzan detrás de la fiebre del oro"*

[13] Acensio. *La Minería en Choco en Clave de Derechos*.

[14] Echavarria, Christina. *What is legal? Formalizing artisanal and small-scale mining in Colombia*. London, United Kingdom: International Institute for Environment and Development, 2014.

away from the forest and to prevent new miners from coming into the area. They also had to desist from harboring prostitution and child sex labor in the area.[15] In 2010 as the harmful effects of mining continued to persist, the new aim was not to end gold mining in Madre de Dios but to limit the size, the use of destructive equipment, and the use of mercury.[16] The government established a legal regimen under which the community mining could become legitimate. It destined funds to help miners follow environmentally sound practices, converting them into sustainable businesses. Those who failed to comply were shut down.

Colombia and Peru share several common variables that affect the illegal mining trade. First, both countries have adopted pro-industry growth policies that have done a disservice to people living in rural areas, and especially those involved in agriculture.[17] The governments' blind eye to these communities, lends for high levels of poverty and unemployment, that fuel the need for subsistence mining. When zooming into Choco and Madre de Dios, there are predominantly indigenous and ethnic minority populations living in these areas which face systemic barriers to better health, educational and economic attainment, because of racism.[18]

"This is evidenced by how in Choco, 30% of the Afro-Colombian population is illiterate, with illiteracy in some rural black communities exceeding 40%. The Colombian health care system covers only 10% of black communities, versus 40% of white communities." [19] The intersectionality of race and class in Latin America that is lived out in these two contexts, suggests that the legalization route in Peru could be a viable way to address mining in Choco, Colombia as well.

In 2014, the Colombian Ministry of Mines and Energy proposed the National Mining Formalization Policy to address the poverty, low-wage and dangerous working conditions, of subsistence small scale miners. While the policy is quite detailed and comprehends the full trajectory for small-scale miners to become legal,[20] it needs to be properly enforced. The government must commit a substantive amount of funds in order to enforce and operationalize the National Mining Formalization Policy.[21]

---

[15] Elbein, Saul. Aljazeera America. 2015. "Grim prospects for sustainable miners in Peru" Accessed 4th of March 2016.
http://america.aljazeera.com/multimedia/2015/9/Peru-mining.html

[16] Eidty, Jack. Wilder Eutopia. 2014. "Peru: llegal Gold Mining versus Biodiversity and Ecotourism" Accessed 4th of March 2016.
http://www.wilderutopia.com/international/earth/peru-llegal-gold-mining-versus-biodiversity-and-ecotourism/

[17] For more information on the context of mining in Peru, and the government's blind eye to the agricultural sector please see:
Cuadros Falla. 2013. "Causas y consecuencias de la minería informal, ilegal, artesanal, el rol de los gobiernos regionales y alternativas de solución" Accessed 31st of July 2017.
http://www.propuestaciudadana.org.pe/sites/default/files/publicaciones/archivos/Tema%202%20-%20MAPE%20-%20Foro%20Virtual%20Red%20Participa%20Perú.pdf

[18] U.S. Congress. Foreign Affairs, Defense, and Trade Division. *Afro-Latinos in Latin America and Considerations for U.S. Policy*. By Clare Ribando. Cong. Rept. Order Code RL32713. 1-22

[19] U.S. Congress. *Afro-Latinos in Latin America and Considerations for U.S. Policy*.

[20] See full policy: Política Nacional para la Formalización de la Minería en Colombia, Colombia 1-58 (Ministry of Mining and Energy 2013).

[21] Echavarria. *What is legal? Formalizing artisanal and small-scale mining in Colombia*.

Best Practice 2: Limit Mercury Contamination

Mechanized gold mining increases the amount of mercury in water. Mercury pollution of the water threatens the species living there and livelihoods of people who depend on fishing for survival. In addition, if this toxic metal is ingested, minimal dosage can have cascading effects on peoples' health, from damaging the central nervous system, the endocrine system, and the kidneys in adults to permanent brain and neurological damage to children and fetus, and finally death.[22]

In 2016, 34 children died from mercury contamination in Choco. A law suit is being filed in the constitutional court to stop the intensive extraction of minerals and forest exploitation with heavy machinery and the use of highly toxic substances such as mercury in the Arato River and its basin.[23] This has gained media attention and international interest. Heightened attention to the devastating effects of mining for the population in Choco, as in other regions of the country could breed an opportunity to enact or enforce regulations limiting mercury contamination.[24]

For example, in the United States, the government has enacted the clean water act in 1972 which sets maximum contaminant standards for the rivers, streams, lakes, and wetlands. This is for several pollutants including mercury. If a person, organization or community carries out any business that could threaten the quality of water, they must have a permit. The Environmental Protection Agency (EPA) or the states issue these permits. Under the law, the US states and EPA also inform the public on which waters are contaminated with mercury and the harmful effects, including the intoxication of the fish. They also identify mercury sources and establish where reductions must take place to meet water quality standards.[25]

As far as legislation in Colombia goes, the Plan Unico is a plan from the Ministry of the Environment with a series of recommendations from the health and environment departments including (1) to study levels of contamination of mercury and monitor its health effects on population living in Choco, (2) have widespread awareness campaigns through mass media about the ill effects of mercury.[26] In conjunction, Law 1568 provides incentives for companies to reduce and eliminate the use of mercury in mining. These are good steps in theory, but in practice the country has far to come. To this day there haven't been any awareness campaigns, and companies continue to use mercury in their mining practices.[27]

Best Practice 3: Detect Mines with GPS Mapping

The GPS is a satellite that can detect landscapes across the globe, and is particularly useful for detecting geographical features. Mining companies use GPS to survey the land, guide machines, carry out drilling and avoid collision. Government and civil society can use it as well, to detect mining sites by monitoring changes is the landscape. The way it works is the four satellites come together to detect a specific location and the intersection of the satellites delimits the mining site.

---

[22] Hearn, Merlin. n.d. "Mercury in Water Causes and Effects on Our Health and the Environment" Accessed 30th of July 2017.
http://www.waterbenefitshealth.com/mercury-in-water.html

[23] El Tiempo. 2015. "Se endurecen controles para evitar la contaminación del agua" Accessed 4th of March 2016.
http://www.eltiempo.com/estilo-de-vida/ciencia/normas-para-evitar-la-contaminacion-del-agua/15428195

[24] El Tiempo. 2015. "Se endurecen controles para evitar la contaminación del agua"

[25] Environmental Protection Agency (EPA) n.d. "Environmental Laws that Apply to Mercury" Accessed 30th of July 2017. https://www.epa.gov/mercury/environmental-laws-apply-mercury

[26] Acensio. *La Minería en Choco en Clave de Derechos*.

[27] Acensio. *La Minería en Choco en Clave de Derechos*.

Shifts such as vast areas of deforestation and changes in the bodies of water are clear indicators of mining.[28]

There are multiple ways to use GPS to detect mines. In 2013 in Ghana, the government sponsored a program destining funds to teams of local environmental whistleblowers. Residents of an area close to essential natural resources were provided with smart phones tied to GPS apps where they were asked to take pictures of the mining sites that they discovered while walking. These photos were then used for the government to track down and shut down the mining sites running without a permit. In 2013 in Goa, India, GPS was used in a different way. Instead of sending people on the ground to look for sites, GPS satellite was used to detect deforestation across the land. The Goa Government sustains that this technology is flawed and is not apt to monitoring the changes in landscapes, claiming discrepancy "with respect to altitude correction" and that hand-held GPS surveys were "not accurate to precisely identify encroachment as these GPS have an inbuilt error".[29]

The practice of using GPS to detect illegal mining sites is not as widespread as other measures to curb mining. In an internet search, GPS mining yielded less than 20 results with clearly identifiable keywords. It also is unheard of within the Colombian borders, and does not come up within any of the policies and plans around mining in the country. It's impossible to conceive what would happen with teams of environmental whistleblowers snapping photos of the mines in Choco, a red zone with high levels of crime and poverty. Even if efforts were to be successful, would the government be able to take action after discovering these sites?

There is knowledge of FARC and militia control of the land leading up to the peace treaties, which is contentious enough that the government tends to steer away from these areas.[30] Some authors even sustain there are government officials who are complacent with illegal mining because they receive a piece of the pie. If any mapping were to take place, and the following step would be to confront FARC or militias in the land, the government must have a coordinated strategy with the ministry of defense to assure the safety and security of those interacting with the rebels and the innocent people from the towns working on the illegal mining sites. For the time being, this is not a sound practice for Choco Colombia.

Best Practice 4: Fund Non-profit and Community Based Organizations

In Choco, the real problem is the systemic poverty that pushes workers to mine for little pay and in precarious conditions. There are plenty of workers that carry out these jobs because they have no other source of income.[31] That's why non-profit organizations and community based organizations are needed to support people in meeting basic needs, and guaranteeing standards of minimum working conditions. In several developing countries where gold mining takes place the practice consists of allocating a part of the national budget to initiatives targeting employment of people of low income in highly vulnerable conditions. Areas that are known for illegal mining are scoped out and community based organizations (CBO) approach workers to gauge their interest in alternative economic opportunities. These organizations not only connect workers with

---

[28] Nayak, Satyabrata. n.d. "GPS and its application in mining." Accessed 30th of July 2017.
https://www.slideshare.net/satyabratanayak560/mine-surveying
[29] Deccan Herald. 2013. "Google, GPS cannot track illegal mining'" Accessed 4th of March 2016.
http://www.deccanherald.com/content/312528/google-gps-cannot-track-illegal.html
[30] Centro Nacional de Memoria Histórica. *Guerrilla y población civil. Trayectoria de las FARC 1949-2013.* Tercera edición. Bogotá, Colombia, 2014.
[31] Política Nacional para la Formalización de la Minería en Colombia, Colombia 1-58 (Ministry of Mining and Energy 2013).

other forms of employment, or legalized mining practice, but offer psychological support, and provide a safe space for whistleblowing so that the subhuman exploitative nature of the mining business can be put to a halt.

In Ghana, it was common for fatal accidents to happen in the mines due to landslides, and the exposure to toxic chemicals during a day's work.[32] In 2009 Free the Slave began a partnership with the Human Rights Non-Governmental Organization (NGO) Social Support Foundation to launch the project Community Resistance to Slavery and Forced Labor (CRSFL). This project consisted of financial literacy and support in the legalization of worker's mining activities so that they no longer had to work under the conditions of slaveholders. The project had an awareness raising component, with training for local government agencies, law enforcement and the media on anti-slavery laws and routes for enforcement. The project also created a task force to quickly detect the presence of child trafficking for direct reporting to the authority.[33]

This response to illegal mining should be replicated in Choco, because it addresses the root of the problem, which is systemic poverty. Other governments may choose to criminalize illegal miners and meet them with fines and prison time, but this does not get to the heart of the problem. It is important to understand, if miners are working in such precarious conditions, with heightened safety risks, it is because there are limited economic opportunities.[34] Colombia and the Choco region could benefit from the government financial support to non-profits and CBOs tackling slavery and trafficking.

Best Practice 5: Tax Large Scale Mining Companies

In many developing countries, the extraction of minerals and natural resources come at great costs to the environment, but with the promises of industrialization and economic development. Although economic growth can come at the expense of the degradation of the natural landscape, only recently are governments starting to demand more sustainable practices. Across the globe governments are imposing taxes on mining companies, such as import duty taxes and laws on transfer pricing and local content. Governments are taxing companies for non-compliance with environmental standards. These economic disincentives limit the spread of mining companies' area of extraction by putting a price on environmental degradation.

Without the intervention of the government there is a clear market failure because mining companies would be free to continue to expand their reach without barriers, soaking up the riches of a public good. Once the fish in a river are intoxicated, or the soil quality has deteriorated to the extent that it cannot sustain the native plant species, the great losses in ecosystem services could never be recuperated.

Bolivia, Brazil, Peru and Chile have all increased their taxes on mining companies in the last decade.[35] In 2013 Ghana increased the corporate income tax for mining companies from 25% to 35%. Considering that Ghana is one of the world's top gold producing industries, the mining sector has a tax system that is different from other countries. As opposed to other countries operating

---

[32] Huffington Post. 2010. "A Program in Ghana Works to End Slavery in Mining Industry." Accessed 4th of March 2016. http://www.huffingtonpost.com/free-the-slaves/a-program-in-ghana-works-_b_799356.html
[33] Huffington Post. "A Program in Ghana Works to End Slavery in Mining Industry
[34] Política Nacional para la Formalización de la Minería en Colombia, Colombia 1-58 (Ministry of Mining and Energy 2013).
[35]Londoño, Viviana. El Espectador. 2012. "Colombia Paraíso Fiscal para la minería." Accessed 4th of March 2016. http://www.elespectador.com/noticias/economia/colombia-paraiso-fiscal-mineria-articulo-391134

conservatively, Ghana has enforced higher tax rates, with special concessions on import duty rates. Companies in Ghana also must comply with a wide variety of laws on pricing, amount of local content and are scrutinized by the Ghana Revenue Authority during regular tax audits.[36]

The proposal to increase taxes on mining companies is less likely to be adopted in Colombia because it goes against the country urbanization and industrialization strategy. Colombia has incentivized foreign and local companies to mine and extract natural resources, and unlike other Latin American countries, it does not demand a percentage of those profits in taxes. While countries across the region have gradually imposed taxes, the Colombian government has subsidized combustible for large companies to continue the extraction of minerals. The Government also authorized the reduction of import taxes and reduced its donations to civil society organizations that tried to enforce social corporate responsibility. The actions of the government speak loudly of where its priorities lie.[37] It would be better to focus attention on an area that has potential to change. Considering a history of elected officials that are pro free market at the expense of the poor, for the last ten years, a policy like this should be introduced when a new contender comes to office.

Conclusion

The best practices address different areas of vulnerability to gold mining in Colombia. The macro level policies that consist in taxing the mining companies, setting limits to levels of mercury contamination and enforcing the restoration protocols, are necessary but difficult to enter into force. For the last decade, non-profit organizations, environmental activists and branches of government have tried to push forth harsher regulations on the extraction of minerals, but there has been little progress. The political environment obstructs the enactment of these practices. The GPS mapping of illegal mining tackles a small portion of the degradation of the environment in mining without addressing the systemic poverty in Choco and in the country.

 The preferred policies for the Colombian context are (1) to create a pathway to legalize small mining communities with less harmful practices to the environment (2) to fund organizations that seek to eradicate the exploitation of low paid workers in the mining industry. The former practice is important because it legitimizes artisanal mining and respects a way of life for small-scale miners in Choco. The project has already been piloted in Rio de Dios, Peru with a community facing the same systemic barriers of poverty and skin color. Legalizing the less harmful practice of gold mining by communities that have long lived in the land increases their agency while fostering a healthy relationship with the land and assuring the protection of its resources from mechanized mining. The latter practice is essential because workers in illegal mines need protection, psychological and financial support to end the cycle of exploitation. The case study in Ghana embodies the ethical response to mining in low income communities. The reason these two practices are highlighted is because they both respond not only to protecting the environment and limiting the reach of mining practices, they also come from a lens of social equity. They both increase the opportunity of people with longstanding cultural rights over the land whose voices have historically been silenced.

---

[36] Kwatia, George. "Mining Taxes for Ghana." Accessed 4th of March 2016.
http://www.pwc.com/gx/en/industries/energy-utilities-mining/mining/territories/ghana.html
[37] Londoño. "Colombia Paraíso Fiscal para la minería."

Bibliography

Centro Nacional de Memoria Histórica. *Guerrilla y población civil. Trayectoria de las FARC 1949-2013.* Tercera edición. Bogotá, Colombia, 2014.

Colombia Vanguardia. 2012. "Aprobado Proyecto que regula el uso de mercurio" Accessed 4th of March 2016. http://www.vanguardia.com/actualidad/colombia/184149-aprobado-proyecto-que-regula-el-uso-del-mercurio

Cuadros Falla. 2013. "Causas y consecuencias de la minería informal, ilegal, artesanal, el rol de los gobiernos regionales y alternativas de solución" Accessed 31st of July 2017. http://www.propuestaciudadana.org.pe/sites/default/files/publicaciones/archivos/Tema%202%20-%20MAPE%20-%20Foro%20Virtual%20Red%20Participa%20Perú.pdf

Deccan Herald. 2013. "Google, GPS cannot track illegal mining'" Accessed 4th of March 2016. http://www.deccanherald.com/content/312528/google-gps-cannot-track-illegal.html

Echavarria, Christina. *What is legal? Formalizing artisanal and small-scale mining in Colombia.* London, United Kingdom: International Institute for Environment and Development, 2014.tie

El Colombiano. 2016. "Mercurio en el agua habría causado muerte de 34 niños en Chocó" Accessed 4th of March 2016. http://www.elcolombiano.com/colombia/mercurio-en-el-agua-seria-causal-de-muertes-de-ninos-en-choco-HM3538595

El Tiempo. 2015. "Se endurecen controles para evitar la contaminación del agua" Accessed 4th of March 2016. http://www.eltiempo.com/estilo-de-vida/ciencia/normas-para-evitar-la-contaminacion-del-agua/15428195

El Tiempo. n.d. "Las cifras que tienen indignado al Choco*."* Accessed 30th of July 2017. http://www.eltiempo.com/colombia/otras-ciudades/las-cifras-que-tienen-indignado-al-choco-28264

El Tiempo. n.d. "Nuevos desiertos avanzan detrás de la fiebre del oro" Accessed 30th of July 2017. http://www.eltiempo.com/archivo/documento/CMS-16460299

Elbein, Saul. Aljazeera America. 2015. "Grim prospects for sustainable miners in Peru" Accessed 4th of March 2016. http://america.aljazeera.com/multimedia/2015/9/Peru-mining.html

Eidty, Jack. Wilder Eutopia. 2014. "Peru: Illegal Gold Mining versus Biodiversity and Ecotourism" Accessed 4th of March 2016. http://www.wilderutopia.com/international/earth/peru-llegal-gold-mining-versus-biodiversity-and-ecotourism/

Environmental Protection Agency (EPA) n.d. "Environmental Laws that Apply to Mercury" Accessed 30th of July 2017. https://www.epa.gov/mercury/environmental-laws-apply-mercury

Hearn, Merlin. n.d. "Mercury in Water Causes and Effects on Our Health and the Environment" Accessed 30th of July 2017.

http://www.waterbenefitshealth.com/mercury-in-water.html

Huffington Post. 2010. "A Program in Ghana Works to End Slavery in Mining Industry." Accessed 4th of March 2016.
http://www.huffingtonpost.com/free-the-slaves/a-program-in-ghana-works-_b_799356.html

Kwatia, George. "Mining Taxes for Ghana." Accessed 4th of March 2016.
http://www.pwc.com/gx/en/industries/energy-utilities-mining/mining/territories/ghana.html

Libertad Digital. n.d. "El terrorismo de las FARC en cifras." Accessed 31st of July 2017.
http://www.libertaddigital.com/internacional/latinoamerica/2016-09-26/las-farc-en-cifras-1276583283/.

Londoño, Viviana. El Espectador. 2012. "Colombia Paraíso Fiscal para la minería." Accessed 4th of March 2016.
http://www.elespectador.com/noticias/economia/colombia-paraiso-fiscal-mineria-articulo-391134

Magia Salvaje. Directed by Mike Slee. Colombia, 2015. DVD.

Mining. 2015. "About 80% of Colombia's gold output comes from illegal miners — Gov't" Accessed 4th of March 2016.
http://www.mining.com/about-80-of-colombias-gold-output-comes-from-illegal-miners-govt/

Ministry of the Environment and Sustainable Development. 2014. "Protocolo de Restauracion Ecologico" Accessed 4th of March 2016.
http://siatpc.iiap.org.co/docs/avances/protocolo_de_restauracion_ecologico.pdf

Nayak, Satyabrata. n.d. "GPS and its application in mining." Accessed 30th of July 2017.
https://www.slideshare.net/satyabratanayak560/mine-surveying

Política Nacional para la Formalización de la Minería en Colombia, Colombia 1-58 (Ministry of Mining and Energy 2013).

Programa de las Naciones Unidas de Colombia. *Colombia rural Razones para la Esperanza.* Bogotá, Colombia, 2011.

Rodríguez Jiménez, J.J. 2001. *Eliminación de iones metálicos pesados*. Documentación Curso de Verano UCLM "Procesos tecnológicos en el tratamiento de aguas".

Rodríguez Mayor, L. 2001. *Tratamiento de aguas: procesos biológicos*. Documentación Curso de Verano UCLM "Procesos tecnológicos en el tratamiento de aguas".

Smith, Michelle. 2012. "Ghana Raises Taxes On Gold Mining Companies: Resource Nationalism." Accessed 4th of March 2016.
http://investingnews.com/daily/resource-investing/precious-metals-investing/gold-investing/ghana-raises-taxes-on-gold-mining-companies-resource-nationalism/

Técnicas Limpias. "Legislación Minera Relevante." Accessed 4th of March 2016.
http://www.tecnologiaslimpias.cl/espanha/espana_legminrelev.html

Acensio Melo, Diego. *La Minería en Choco en Clave de Derechos*. Bogota, Colombia: Tierra Digna, 2016.
http://tierradigna.org/pdfs/LA%20MINERIA%20EN%20CHOCO_web.pdf

Universidad Tecnológico del Choco. "Minería y Restauración Ecológica para el Post-conflicto en el Chocó" Accessed 4th of March 2016.
http://www.utch.edu.co/portal/es/noticias/1234-miner%C3%ADa-y-restauraci%C3%B3n-ecol%C3%B3gica-para-el-post-conflicto-en-el-choc%C3%B3.html

U.S. Congress. Foreign Affairs, Defense, and Trade Division. *Afro-Latinos in Latin America and Considerations for U.S. Policy*. By Clare Ribando. Cong. Rept. Order Code RL32713. 1-22