



The extractive industry in Latin America and the Caribbean: health impact assessment as an opportunity for the health authority

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Abstract

Objectives The extractive industries have contributed to the economic and social development of Latin America and the Caribbean for centuries. We have undertaken a narrative review to assess the role of the health authority in the decision-making process as it relates to extractive industry projects.

Methods A narrative literature review was conducted with a keyword search conducted using PubMed, Scientific Electronic Library Online and Google. This was complemented with manual searches of relevant journals and reference lists of primary articles.

Results A broad body of literature from Latin America and the Caribbean region provides evidence that the public health of communities engaged in extractive industry is not being assured and that significant gaps exist in aligning public and private sector efforts to improve health.

Conclusions Inclusion of the health authority in impact assessment has the potential to result in lasting positive effects on communities involved directly and indirectly in

the extractive industry, while preventing a large range of potential adverse health impacts.

Keywords Extractive industries · Health authority · Health impact assessment · Latin America

Introduction

Since colonial times, oil and ore extraction have been firmly engrained in the Latin American and Caribbean Region (Region) economy, culture and society (Prieto 1973). Zacatecas, Mexico and Potosi, Bolivia are well known mining communities, but among the hundreds where extractive industry (EI) has been a predominant economic force for generations (Brown 2012). After more than five centuries of EI, economic development associated with the extractive industry continues to be contrasted with its impact on society, health, and environment (Brown 2012). Each EI boom brings the fear of negative social and environmental impacts as well as significant revenue to stimulate economic growth and reduce poverty. Over the past decade many countries in the Region have seen increasing conflict between EI growth and negative public health effects (Cardenas 2014; JA 2014). This situation requires the standard application of decision-making tools to diminish the likelihood of EI as a source of conflict and tragedy, but rather an opportunity to promote growth through fiscal revenue and social investment.

The countries with a prominent history in mining continue to produce much of the world's metal exports, and new sources of energy such as lithium in Bolivia, shale gas in Mexico, and natural gas in Bolivia and Peru (Hinojosa 2012; Torres-Slimming 2010; Estrada 2013). The traditional extractive export countries (e.g. Mexico, Guatemala,

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Nicaragua, Bolivia, Chile, Peru, and Colombia) continue to rely heavily on large corporative mining of metals alongside increasing growth of small artisanal operations (Monaldi 2014; Stucchi and Pichard 2003). Bolivia, Ecuador, Mexico and Peru have seen continued investment in oil and more recently natural gas extraction (Hinojosa 2012; Torres-Slimming 2010; Estrada 2013). Countries traditionally reliant upon non-extractive industries are now turning to ore and oil extraction for an increasing percentage of their national economies (Monaldi 2014). Examples are exploration for iron ore in Uruguay, copper in Panama, the doubling of gold production in Surinam and Guyana, and new mine developments in Dominican Republic (gold), Cuba (nickel), and Jamaica (bauxite) (Stucchi and Pichard 2003). Venezuela and Chile are examples of economies that lead the world in extraction of petrochemicals and industrial mining (World Bank 2012). EI represents a significant portion of gross-domestic product (GDP) and exports for low- and high-income countries as can be appreciated in Tables 1 and 2.

The Region continues to depend heavily on EI based economies and is increasingly faced with the challenge of environmental and health impacts that affect vulnerable populations. Despite advances in policies and efforts to protect human health, the Region continues to report associated yet preventable health impacts. The Regional examples presented in this review support an opportunity for the health authority to further population health efforts aimed at EI projects and policies.

This paper explores the evidence behind a more systematic consideration of health by the health authority in Regional EI projects. We provide a review of various health effects associated with the EI to provide a measure as to the scope of the problem. Recommendations are proposed for the health authority to seek out means to protect the public health associated with EI in the region. The primary objective of this review is to provide an overview of the current status of health impacts on populations associated with the EI and recommendations for health policy makers.

Methods

This narrative review followed the general steps of identifying research related to impact assessment and health impacts of the EI in the Region, health authority involvement in EI, locating relevant studies, selecting references from those studies, and summarizing the findings. The purpose of this review was to examine the application of impact assessment and health effects through a thematic categorization of issues discussed in the literature. The literature sought were those published between the years

2000–2015 mainly in English, Spanish and Portuguese language in peer reviewed journals and government sources. The main search engines used to source literature were PubMed, Scientific Electronic Library Online and Google. The search was conducted using “health impact assessment”, “avaliação do impacto na saúde”, “análisis de impacto en salud”, y “evaluación del impacto en salud” as keywords. The identified papers were then screened and included in the dataset if they classified as reporting on HIA as defined by the international best practice principles: “HIA is a combination of procedures, methods, and tools that systematically judges the potential, sometimes unintended, effects of a policy, plan, program or project on the health of a population, including the distribution of those effects within the population, and identifies appropriate actions to manage those effects” (Quigley et al. 2006). The publications identified were then hand-searched for potential additional important articles.

Results

Sustained regional development and the case for inclusion of health in extractive industry related impact assessment

While the breadth of EI project externalities with the potential for degrading human health is vast, they are preventable if health is addressed adequately and by multiple stakeholders in the impact assessment process (Winkler et al. 2013; Banken 2003). Impact assessment is recognized as a fundamental and preliminary component for responsible mining and community transparency (Winkler et al. 2011; Goodland 2012a). In the Region’s past and present there are specific cases where EI significantly influences population health. These cases should be a prompt for future action to act in a preemptive way in order to determine if the effect strengthens or weakens population health. Industry, lending institutions, and the health authority all have significant leverage to radically improve the associated population health planning that would be part of the impact assessment process. If the case for inclusion of health is not sought, then regional EI development may bring long-term negative consequences by means of direct and indirect influence on social and environmental determinants of health (Goodland 2003).

Multiple direct and indirect pathways affect communities involved in the EI that may be estimated through effective public health planning efforts (Winkler et al. 2010, 2011; ICM 2013). Among the International Finance Cooperation (IFC) standards related to community health are anticipation and avoidance of adverse impacts on the health and safety of the affected communities during the project life cycle and

Table 1 Contribution of minerals to national economy (Latin America) (World Bank 2012)

Countries in Latin America ranked by mineral rents % of GDP	Commodity	Ores and metals exports (2012), % of total exports	Mineral rents (2012), % of GDP	Human development index (HDI)
Suriname	Alumina, bauxite, gold, hydraulic cement	76 %	21.5 %	0.70
Guyana	Gold, hydraulic cement	21 %	16 %	0.64
Chile	Copper, gold, silver, iron, molybdenum	61 %	15.3 %	0.82
Peru	Copper, gold, iron, lead, silver, zinc, tin	49 %	8.6 %	0.74
Bolivia	Silver, antimony, tungsten, gold, lithium, iron	25 %	4.2 %	0.67
Brazil	Iron, gold, tin, copper, Bauxite	16 %	2.3 %	0.74
Jamaica	Alumina, bauxite, gold, silica, gypsum, hydraulic cement, quicklime and hydrated lime	8 %	2.3 %	0.72
Nicaragua	Gold and silver	2 %	1.5 %	0.61
Guatemala	Gold, nickel, tin, silver, copper, lead, zinc	6 %	1.2 %	0.63
Mexico	Copper, gold, lead, zinc, silver, molybdenum	4 %	1 %	0.76
Colombia	Nickel, gold, platinum, silver, iron, copper, bauxite	1 %	1 %	0.71
Argentina	Gold, silver, lead, zinc, boron, limestone, copper, aluminum	4 %	0.8 %	0.81
Honduras	Gold, lead, hydraulic cement, natural iron oxide pigments, silver, zinc	3 %	0.8 %	0.62
Venezuela	Bauxite, gold, iron	1 %	0.8 %	0.76
Dominican Republic	Bauxite, gold, gypsum, hydraulic cement	4 %	0.7 %	0.70
Panama	Gold, hydraulic cement	1 %	0.6 %	0.77
Ecuador	Barite, copper, feldspar gold, gypsum, hydraulic cement, silica, kaolin, raw steel	1 %	0.1 %	0.71
Uruguay	Gold, cement, iron and steel	<1 %	0.1 %	0.79
Costa Rica	Gold, silver	2 %	0	0.76
El Salvador	Gypsum, hydraulic cement, raw steel	2 %	0	0.66
Paraguay	Cement, iron and steel	1 %	0	0.68
Trinidad and Tobago	Ammonia, hydraulic cement, pig iron, raw steel	0	0	0.77
Belize	Gold, silica, limestone	0	0	0.73
Cuba	Ammonia, chromite, cobalt, gold, silica, raw steel, hydraulic cement, gypsum	Data not available	Data not available	0.81

safeguarding of personnel and property that avoids or minimizes risks to the affected communities. Specifically, IFC performance standards 1 and 4 relate to prevention of actions that might lead to adverse environmental and community health. Health impacts can be addressed and mitigated at the permitting, operation, and construction phases of the project (World Bank Group 2014).

Among the broad categories with the potential to negatively impact health in oil, gas, and mining developments are the following: (1) acquisition and distribution of EI related taxes/royalties; (2) land use planning related to migratory trends; (3) establishing transportation networks and resulting human morbidity and mortality; (4) influx of

population, changes in ecosystems and effects on disease patterns; (5) natural resource management; (6) air contaminants; (7) generation and disposal of hazardous and non-hazardous waste; (8) rapid development and associated mental health and well-being of indigenous populations (Barron et al. 2010). By prospectively addressing these categories sustainable and long-term growth is more likely, through investment in the well-being of oftentimes the most vulnerable populations (IFC 2010).

As most developments influence a wide spectrum of social and environmental determinants of health, we specify below a number of principle impact pathways and potential negative health outcomes.

Table 2 Contributions of oil, natural gas and coal to national economy (World Bank 2012)

Countries ranked by petrochemical rents % of GDP	Petrochemical (oil, natural gas, coal exports) 2012 % of total exports	Petrochemical (oil, natural gas, coal rents) 2012 % of total exports	Oil rents 2012 % of GDP	Natural gas rents 2012 % of gdp	Coal rents 2012 % of GDP
Trinidad and Tobago	66 %	31.8 %	11.1 %	20.7 %	0
Venezuela	97 %	27.8 %	26.7 %	1.1 %	0
Ecuador	58 %	19.2 %	19.1 %	0.1 %	0
Bolivia	55 %	13.2 %	5.4 %	7.8 %	0
Colombia	70 %	9.6 %	8.1 %	0.4 %	1.1 %
Mexico	14 %	7.3 %	6.8 %	0.5 %	0
Argentina	6 %	4.7 %	3.7 %	1 %	0
Brazil	11 %	2.8 %	2.7 %	0.1 %	0
Peru	15 %	2.3 %	1.5 %	0.8 %	0
Guatemala	4 %	0.7 %	0.7 %	0	0
Chile	1 %	0.2 %	0.1 %	0.1 %	0
Paraguay	31 %	0	0	0	0
Belize	27 %	0	0	0	0
Jamaica	24 %	0	0	0	0
Suriname	9 %	0	0	0	0
Honduras	4 %	0	0	0	0
El Salvador	3 %	0	0	0	0
Nicaragua	2 %	0	0	0	0
Uruguay	1 %	0	0	0	0

Conflict

Since colonial times the EI has proven a fundamental cause for numerous peaceful and violent changes in regional governments. One example of this was over the perceived oil wealth that resulted in the long and brutal Chaco war between Bolivia and Paraguay in the 1930s (Galeano 1971; Brown 2012). Conflict remains a frequent theme in the Region's EI with projects fuelling protest and unrest across the Region (Bebbington 2013; Goodland 2012a). Often-times unrest involves vulnerable indigenous populations whose health has been directly or indirectly affected by EI operations (Vittor 2014). These conflictive situations have increased in Colombia, El Salvador, Guatemala, and Peru with a rising perception among indigenous populations that EI has negatively altered social and environmental determinants of health (Achtenberg 2014; Pedersen 2014; Redner 2014; FIDH 2013). These include accounts of EI uprooting indigenous populations, polluting and contaminating surrounding areas, and exacerbating community health concerns (Ruge 2008).

The case of the Cerro Blanco mine led to a long running transnational dispute in Guatemala and El Salvador over water contamination and effects on livelihood (Goodland 2012b). Insufficient evidence was collected on the environmental and health risks and communities were not well informed. Use of impact assessment tools in the

exploratory phase would have indicated zones unsuitable for mining as well as considering indigenous values. The perceived human health impacts without the use of prospective health assessments resulted in El Salvador establishing a mandatory moratorium on metal mining in some jurisdictions (Goodland 2012b). In both scenarios win-win solutions for the country, industry and community would have been attainable if the mandate and capacity to conduct adequate health assessments and guarantee responsible mining were functions of the health authority.

The emergence of institutional innovations in the Region to manage conflict resolution offers some promise for the future. The way in which government health authorities, lending institutions, communities, and those in power come together to minimize conflictive situations will allow for responsible industry growth (Bebbington 2013).

Environmental contamination

The linkages between environmental contamination and EI have existed in the Region for centuries, with pollution frequently affecting the health of the most vulnerable communities (Ruge 2008). One of the more widely noted environmental contaminants is methyl mercury related to gold mining throughout the Region (Alvarez 2000; Sieber and Brain 2014; Peplow and Augustine 2011). While mercury is perhaps the most regularly documented public

health concern associated with mining in the Region there are other sources of environmental pollution to be considered.

Another example of health impacts associated with heavy metals and mining is the case of human exposure through soil contamination in Peru. One study indicates that high lead soil levels in Peru affects the health of more than 1.6 million people (Van Geen et al. 2012). Another site-specific study found soil levels for lead and arsenic in the historic mining town of La Oroya, Peru to be a serious public health concern (Reuer et al. 2011).

In addition to mining there are significant public health impacts associated with petrochemical extraction documented in a number of Andean nations (Bebbington 2009). In Ecuador, where oil extraction has been underway since the 1960s, there is evidence for hydrocarbon concentrations in water above minimum levels, toxicological effects on rural indigenous populations, and resulting public health emergencies (San Sebastian and Hurtig 2004). In the past decade Southern Bolivia has emerged as one of the largest exporters of natural gas in the Region with an estimated 400 tons per day in 2016. While natural gas has transformed the vast Bolivian Chaco desert, health governance and sustainability remain deficient, and community inclusion with emphasis on health inequities is limited (Hinojosa 2012).

While much of the region has depended on EI for centuries, several countries are more recently considering it as a viable means for economic growth. At the same time the concerns have escalated in these countries around the potential environmental health threats. In Uruguay the shift from largely cattle ranching and forestry to iron ore extraction provides a recent example. Uruguay remains divided in terms of whether the sustained economic growth outweighs the environmental health costs. (O'Neill 2013; Zibechi 2013). Similarly in Mexico, inspired by the US boom, shale gas extraction is on the rise in spite of the potential health and environmental threats (Estrada 2013). Uruguay and Mexico represent countries with emerging investment in extraction with the potential to incorporate sustainable health and development policies. Increased oversight by government, industry and the health authority may permit avoiding the pitfalls of countless Andean and Central American mining towns.

Infectious diseases

Research in the Region has documented higher risks for sexually transmitted diseases (STD) in mining communities. This has been attributed to high concentrations of young men and the presence of sex workers with limited power to promote safe sexual practices (Faas et al. 1999). In Venezuela, Peru, and Guyana STD risks and prevalence

have been documented as higher than national averages (Faas et al. 1999; Colchester et al. 2002; Astete et al. 2010; Plenge et al. 2012; Orellana et al. 2013).

In Suriname and Peru mining is also associated with other transmissible diseases like malaria and tuberculosis (Plenge et al. 2012; McAnarney 2013). In 2012 a public health report in Suriname documented that 81 % of all new malaria cases were found in migratory mining populations (McAnarney 2013). The remote Camisea natural gas extraction site in Peru provides another example of the importance of planning adequate health systems that include community promotion, prevention and education. The criticisms of Camisea relate to the social impacts on indigenous groups and the emergence of infectious diseases, all directly linked to the exploration and exploitation of natural gas in the region (Torres-Slimming 2010).

Mental health

The negative impact on family cohesion, mental health associated with stress/uncertainty, and addictive behaviors have all been documented in mining operations in the Americas (Shandro et al. 2011; Plenge et al. 2012). Other reports have documented EI operations as increasing the rates of violence and direct association with organized crime (JA 2014). In a Peruvian study the authors found high rates of depression and anxiety associated with populations residing in these communities (Astete et al. 2010). The Marlin and Conga gold mines of Guatemala and Peru are perhaps the largest and most controversial in the Region. Some of the concerns have been the polarization of community members, threats to subsistence farming, increased alcohol consumption and violence, and increased prostitution (Goodland 2012b).

The documented threats to well-being undermine profitable resource development through insufficient prior public health data collection to establish actual relationships between environmental determinants and health outcomes. These regional examples underscore the current shortcomings of public institutions to establish effective programs that promote health as a core component of sustainable EI efforts. They suggest that EI growth is occurring more rapidly than institutional innovation, resulting in a decline in human health and livelihoods. These findings have the potential to undermine sustained regional growth in industry, profits and royalties.

Environmental and health impact assessment in the Region

In spite of the tendencies both within and between countries to incorporate EI social and environmental safeguards, there remain limited standard linkages to engage public

health. In 2006 the World Bank provided a detailed regional 20-country analysis of the environmental impact assessment (EIA) requirements through Ministries of Environment, Sustainable Development, and Natural Resources. The findings reveal that most countries in the Region do have EIA regulations, but their application, scope and impact are limited (Sanchez-Triana & Santiago 2007). There are significant differences in impact assessment application in the Region. These differences include the following: (1) organization responsible for institutional leadership; (2) criteria used for screening; (3) terms of reference guidelines; (4) level of public participation; and (5) monitoring of potential impacts post-assessment. Overall, the Region applies EIA as a means to rapidly determine impacts from a specific project and is not used as a planning tool to determine impacts from specific sectors, cumulative or long-term impacts (Acerbi et al. 2014).

While health and safety issues continue to be important considerations in conducting impact assessments, they traditionally focus on occupational health and safety within the boundary or “fenceline” of the proposed project (Birley 2011). The public health services, outreach, and determinants of health, are oftentimes not adequately assessed, if not standard and mandatory requirements applied by lending institutions (IAOGPIIECA 2005; World Bank Group 2014; Equator Principles 2013; Winkler et al. 2013). In the Region this scenario holds true, as made up of largely low- or middle-human development index (HDI) countries, with limited public sector health capacity to promote impact assessment policies, programs and projects (Drewry and Kwiatkowski 2015).

HIA is a promising methodology to bridge the public health responsibilities of national, state and private industry to bolster public health systems (National Academy of Sciences 2011). Furthermore, at the national and local level, governments have realized the value of HIA as a vital planning tool to strengthen environmental and public health programs (Cole and Fielding 2007). National policies should include the health authority to mandate HIA along the lines of the United Nation’s World Health Organization (WHO) HIA manual (Goodland 2003).

In response to the perceived EI related impacts in the Region, health authorities are seeking workable policies that take a population health approach. Brazil, Chile, El Salvador, Jamaica, Mexico, and Uruguay have all in the past 5 years made progress towards the establishment of plans to improve the impact assessment capacity within their health ministries (Table 3) (PAHO 2010, 2013; Matus 2011; Pan American Health Organization 2010; Secretaria de Salud Mexico 2011). In Brazil, for example, the assessment of health-related impacts often occurs within EIA as required under the project licensing process (Cunha et al. 2013; Silveira et al. 2012). Similarly, Peru and

Colombia have integrated the assessment of health impacts into existing environmental and social assessment frameworks (Goodland 2011; Winkler et al. 2013; Pan American Health Organization 2013).

These actions are a response to the pressing need to strengthen public health protection measures for communities affected by extractive and other industries. This is of particular importance as public administrative decision-making is oftentimes a process of political bargaining that frequently may not consider probabilistic criteria to avoid unforeseen consequences. The increasing interest from regional health authorities to determine sustainable solutions to mitigate health impacts, are likely related to enhanced social communication among affected populations, the outcry from rural indigenous populations and the recognized value of inter-sectoral collaboration among national ministries.

As countries in the Region increase their dependence on EI, sufficient emphasis should be placed on recognition of potential health externalities. Establishing an appropriate balance of accompanying health policies and practices will be required to protect public health. Health authorities in the Region are well positioned to foster public, private, and lending institution efforts aimed at safeguarding and promoting community health.

Strategic entry points for insuring health are community engagement, impact assessment (including environmental impact assessment, strategic impact assessment, strategic health assessment), sustainable development programs including the health authority, and incentives from lending institutions to increase public sector health capacity. Additionally, the formation of HIA professionals and teams provides a mechanism for prospective planning, public and private engagement, and the establishment of long-term measures to protect the public health of EI communities. Increasing the role of the health authority in HIA programs prevents the introduction of non-endemic disease, empowers communities to influence decision-making for health, increases women’s role and benefits, and engages local authorities in project-level health monitoring activities (WHO 2010).

Discussion

In spite of decades of promoting HIA in the Region the EI remains limited to inclusion in the environmental impact assessment (EIA) process, oftentimes without adequate consideration of health. Solely relying on EIA to analyze health- and well-being-related externalities has not proven sufficient to engage public health professionals and thereby mobilize public, private and lending institutions in the process.

Table 3 Advances in the Region towards integration of health into impact assessment

Country	Year	Interest in health impact assessment	Step to address health impacts in extractive industry
Brazil	2009	Growth in large industrial development projects	Formation of center for sustainable development with health expertise and development of manuals
Chile	2013	Increased community and occupational health effects associated with mining	Workshops on integration and proposal to create a health impact assessment unit within the Ministry of the Environment; development of national HIA guidelines
El Salvador	2013	Contamination of natural resources through mining	Consultations to integrate health and environmental impact assessment
Jamaica	2011	Sustainable development of industrial growth	Health impact assessment manual
Mexico	2011	Extractive industry, air contamination and determinants based curriculum development in schools of public health	Development of manual for division of health promotion on HIA and integration into schools of public health in determinants curriculum
Peru	2012	Environmental health effects from mining	Workshops on integration and proposal to create a health impact assessment unit within the Ministry of the Environment Development of independent unit for inter-sectoral collaboration, emphasis on environmental health risk monitoring systems and social determinants of health
Uruguay	2013	Proposed opening of iron ore mines and generally consideration of EI as emerging sector in future growth of country	Mining and sustainable development conferences and consultations with key officials in impact assessment

It is evident from this review that in spite of the current commodities downturn, that the Region will remain highly dependent on the EI for future growth. This is the case for much of Central America, the Caribbean and Uruguay with more recent plans for expansion in the sector. Studies have found multiple direct and indirect health impacts from EI, and as a result lending institutions are beginning to place more priority on community health safeguards. The primary health impacts that were noted in this review are those related to human security, environmental health, infectious disease and mental health.

The most established impact assessment method (EIA) does not have uniformity across the Region. Substantial differences in responsible organizations, rigor of the process, and monitoring are evident. Furthermore, the health authority is oftentimes not a central player in this process. However, as the result of a relatively new regional focus on social/environmental determinants, health impacts now clearly linked to the EI, and the desire to integrate health into other sectors, some countries are beginning to consider HIA as a service of the health authority. A potential limitation to the use of HIA to guide action is that negative impacts on health may be synergetic and cumulative taking longer periods of time to detect. Nonetheless there remains promise within the EI as a potential means to strengthen the capacity of the health authority and rural public health systems.

Recommendations

The following recommendations are based upon the past HIA efforts in the Region and author perspectives on advancing the practice.

1. Promote HIA awareness and knowledge. Increase efforts to form linkages between national institutes of health to incorporate HIA and EI. Despite the availability of HIA guidance tools, adequate applied materials to move from theory to practice are only just being developed in Spanish and Portuguese. While groups like ICMM and International Association of Oil and Gas Producers and International Petroleum Industry Environmental Conservation Association (IAOGPIIECA) provide materials in English they currently do not exist in Spanish (ICMM 2010; IAOGPIIECA 2005).
2. Determine the barriers and enablers for building HIA capacity for the health authority. An organizational analysis of key institutions should be completed to provide HIA-enabling institutions, health and environment regulations, and the role of key sectors to strategically influence health. This would include country-specific data on the status of EIA and HIA policies, practices, laws, and regulations.
3. HIA to strengthen public health systems. The stages of the HIA where potential health impacts are prioritized and systems developed to monitor health are critical components that should be part of national health systems in the Region. For example, heavy metal monitoring systems implemented through HIA recommendations would allow countries to baseline data and local collection capabilities, rather than the current situation with limited indication for pre-existing contamination. Ministerial units and national foundations with health and impact assessment expertise to design implement and oversee a comprehensive national

strategy of social investment in health and development.

4. Train the health authority. Although limitations exist in HIA capacity and regulation within Ministries of Health, it remains the most appropriate sector to pilot its application. Other regions of the world provide evidence for mutual interests that exist between EI and health sectors and the public health benefits from establishing joint objectives (O'Mullane 2013). The development of workforce skills within ministries of health (e.g. systematic screening procedures to prioritize EI projects or policies requiring an HIA) and mechanisms for creating linkages with other sectors is essential.
5. Create a favorable environment for national policy development. One means of enhancing HIA in EI is through a structured mechanism to promote healthy public policies through strategic health impact assessments (SHIA) (Joffe 2008, 2010). Compared to HIA, the SHIA has a national or regional perspective and could be conducted by EI professionals, with a focus on establishing evidence base. Its application would strategically target EI and explore the impact of key mining or petrochemical policies with the potential to influence burden of disease. The application of SHIA in the Region would be useful in influencing policy, informing the private/public sectors, and disseminating scientific evidence among countries.

Conclusions

The long-term regional growth, diversification and increasing complexity of the EI sector are a certainty. Sufficient evidence exists on the EI community health outcomes without the use of appropriate planning and public health tools. Public health systems should adequately estimate and prepare for the potential negative health effects of development projects. Until the health authority is included as part of a platform for the planning of national projects and policies, sustained growth will not be possible. The fluctuating yet consistently long-term upward trend in Regional EI investment represents an opportunity for the health authority to engage industry, lending institutions and other governmental entities involved in impact assessment. Health authorities should consider impact assessment as one means to prevent and promote community health for the vulnerable populations that make many of these developments possible.

Compliance with ethical standards

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Ethical approval This article does not contain any studies with human participants or animals performed by any of the authors.

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