

Delivering Sustainable Development Goals: the need for a new international resource governance framework

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Abstract

Delivery of the Sustainable Development Goals within the agreed 15-year timetable aims for the improvement in the quality of life for many of the World's poorest. These, coupled with a goal for the creation of new power generation and transmission technologies thus addressing the expectations of the Paris Agreement will increase demand for metals and minerals. To ensure continuity of supply in both metals and minerals, concerted action and agreement at an international level is necessary. New, transparent, internationally agreed governance arrangements are needed to avoid disruption of supply and to sustainably manage the efficient and effective exploitation of metal and mineral resources.

1. INTRODUCTION

On 25 September 2015, 193 world leaders agreed to 17 Sustainable Development Goals (SDGs) (<http://www.un.org/sustainabledevelopment/>, last access: 22 July 2017) to eradicate extreme poverty, tackle inequality and place the global

community on a more sustainable pathway by 2030. The SDGs replace the Millennium Development Goals agreed in 2000. The SDGs, officially known as "Transforming our world: the 2030 Agenda for Sustainable Development" is a set of seventeen aspirational Global Goals responsible for 169 targets (Figure 1). Spearheaded by the United Nations (UN),



Figure 1: Sustainable Development Goals [UN, 2015].

through a deliberative process involving its 194 Member States, as well as global civil society, the goals are contained in paragraph 54 United Nations Resolution A/RES/70/1 (http://www.un.org/pga/wp-content/uploads/sites/3/2015/08/120815_outcome-document-of-Summit-for-adoption-of-the-post-2015-development-agenda.pdf, last access: 22 July 2017).

The SDGs represent a significant step forwards as they better reflect national contexts, include issues such as energy and climate change which were previously excluded, and were created through a more open and inclusive process that responded to the priorities of people with direct experience of poverty.

Two of the SDGs refer directly or indirectly to resource extraction and use (Table 1). These two SDGs refer to sharing the wealth generated by mining more equitably and to socio-cultural consequences of geological activities, including nation building. How are such objectives to be delivered?

Table 1: Sustainable Development Goals referring to resource use [UN, 2015].

Goal 8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.	
	8.4	Improve progressively through 2030 global resource efficiency in consumption and production, and endeavour to decouple economic growth from environmental degradation.
Goal 12	Ensure sustainable consumption and production patterns.	
	12.2	By 2030 achieve sustainable management and efficient use of natural resources .

2. BACKGROUND

Of the world's 200 or so countries, large-scale mining activities occur within less than 60, partly because of the control of geology but also for reasons as diverse as the absence of modern mining laws, lack of baseline geological and geophysical information, inadequate transport and communications infrastructure,

minimal skilled indigenous workforces and poor stable governance. In many countries there exists an antithesis to mining. Often countries fear 'resource colonialism' and wish to retain more of the wealth from mining by adding value "in-country". Notwithstanding a less than perfect record of environmental management, responsible resource development has the proven potential to alleviate poverty and empower communities and nations, particularly in less developed nations.

The improvement in the standard of living of many of the world's poorest during the last half century has been driven in large measure by technological development. Such development has depended on the use of an increasingly wide range of minerals and metals.

Although the demand for all minerals and metals has risen dramatically, the scale and complexity of supplying this demand are under-acknowledged. Sverdrup et al. [2013] have shown the continuing rise in demand for selected metals and elements from 1900 to 2010. That rise in demand results from increasing population and increasing consumption in both more developed and less developed countries, particularly from South East Asia where essential modern infrastructure is now being actively addressed [UNEP, 2015].

Among non-technical audiences, including opinion formers, policy advisers and decision makers, there seems to be an almost implicit assumption that future mineral and metal demand will be met either by increased recycling, substitution, or technological improvements in primary production processes; but there are considerable challenges in doing so.

To meet present demand, surface mines are forced to extract deeper and lower grades are being utilized [Schodde, 2014], arguably the most easily found deposits are already known, and the discovery of new deposits is failing to keep pace with the rate of exhaustion and the rising costs of exploration and development. Using copper as an example to illustrate the challenge of meeting future demand this century, the graph in Figure 2 shows historical and projected primary copper production from currently known resources and projects a shortfall in supply of 30 Mt by 2050. Given the life expectancy of infrastructure, much of the copper

may be locked away for 80 to 120 years. Even under the most efficient recycling processes the need for primary production will continue, albeit potentially at a lower level. But as long as the supply of primary materials is assured, it may act as a disincentive to recycling and substitution and moves towards a circular economy. Copper, iron and aluminium are estimated to be relatively plentiful. Other individuals have looked at more critical metals. Based on known deposits, Henckens et al. [2014] suggest that antimony will become exhausted in about 30 years, gold within about 40 years and zinc and molybdenum within 80 years.

To meet the projected increased demand, more not less mining is inevitable particularly when the demand for new electricity generating and transmission technologies, consequent on the implementation of the Paris Agreement (FCCC/CP/2015/L.9/Rev.1,

one use of land and in competition with other uses such as agriculture, amenity, industry, forestry, water protection and increasing urbanisation. To proceed requires consent and a social licence to mine.

3. THE BRUNDTLAND COMMISSION

Ten years after the 1972 United Nations Conference on the Human Environment held in Stockholm (Sweden), it was clear that most of the identified global environmental challenges had not been adequately addressed. Many of these challenges had grown. In particular, the underlying problem of how to reduce poverty in low-income countries through more productive and industrialized economy without, in the process, exacerbating the global and local environmental burdens, remained unresolved. Neither high nor low-income countries were

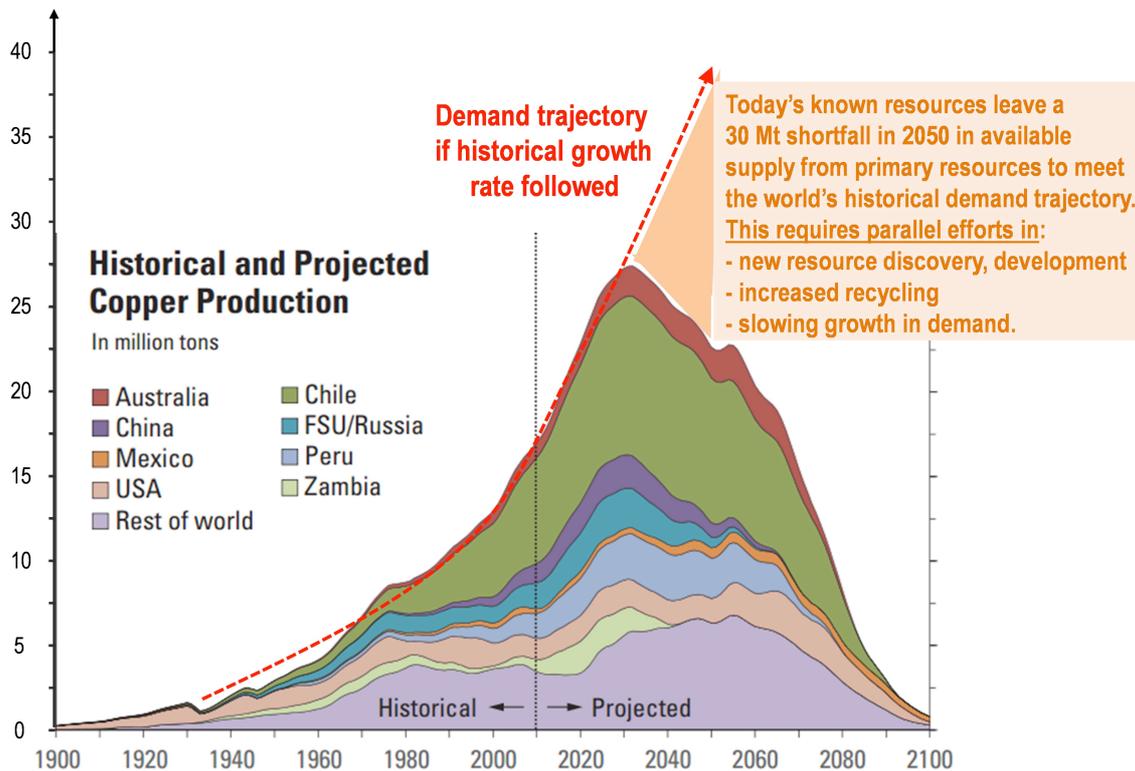


Figure 2: Historical and projected primary copper production. Modified from [Kerr, 2014] and [Northey et al., 2014].

<http://unfccc.int/resource/docs/2015/cop21/eng/l09r01.pdf>, last access: 22 July 2017), to decarbonise the global economies is taken into account [Kleijn et al., 2011]. But mining is but

willing to surrender economic development based on growth, but environmental threats, ranging from pollution, acid rain, deforestation and desertification, the destruction of the ozone

layer, to early signs of climate change, were becoming increasingly unacceptable. There was a tangible need for a developmental concept that would reconcile economic development with environmental protection. Views differed on several questions: were local environmental problems the result of local developments or of a global economic system that particularly adversely affected the environment of low-income countries? Did environmental burdens result mainly from destructive economic growth-based development or from a lack of economic development and modernization? Would reconciling the economy and the environment require mainly technical solutions by using more resource-efficient technologies or mainly social and structural changes that would include political decision-making as well as changes in private consumption patterns?

The 1980 World Conservation Strategy of the International Union for the Conservation of Nature [IUCN, 1980] was the first report that included a very brief chapter on a concept called "sustainable development." The document focused on global structural changes and was not widely read.

In December 1983, the Secretary General of the United Nations, Javier Pérez de Cuéllar Guerra, asked the Prime Minister of Norway, Gro Harlem Brundtland, to create an organisation independent of the UN to focus on environmental and developmental problems and solutions. This new organisation was the Brundtland Commission, or more formally, the World Commission on Environment and Development.

The organization aimed to create a united international community with shared sustainability goals by identifying sustainability problems worldwide, raising awareness, and suggesting the implementation of solutions. In 1987, the Brundtland Commission published the first volume of "Our Common Future," (www.un-documents.net/wced-ocf.htm, last access: 22 July 2017) the organisation's main report, which is credited with crafting the most prevalent definition of sustainability.

A key element in the definition is the unity of environment and development. The Brundtland Commission provides an alternative per-

spective on sustainable development, unique from that of the 1980 World Conservation Strategy of the IUCN. The Brundtland Commission pushed for the idea that whereas the "environment" was previously perceived as a sphere separate from human emotion or action, and whereas "development" was a term habitually used to describe political goals or economic progress, it is more comprehensive to understand the two terms in relation to each other. Brundtland argues:

"...the "environment" is where we live; and "development" is what we all do in attempting to improve our lot within that abode. The two are inseparable."

The Brundtland Commission insists upon the environment being something beyond physicality, going beyond the traditional school of thought to include social and political atmospheres as well as circumstances. It also insists that development is not just about how poor countries can ameliorate their situation, but what the entire world, including more developed countries, can do to ameliorate our common situation.

Brundtland defines sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The two key concepts of sustainable development are:

- a) the concept of "needs" in particular the essential needs of the world's poorest people, to which they should be given overriding priority;
- b) the idea of limitations which is imposed by the state of technology and social organization on the environment's ability to meet both present and future needs.

The central idea of the Brundtland Commission's definition of "sustainable development" is that of intergenerational equity. In sum, the "needs" are basic and essential, economic growth will facilitate their fulfilment, and equity is encouraged by citizen participation. The element of humanity distinguishes this definition from previous ones.

The Brundtland Commission Report recognised that human resource development in the

form of poverty reduction, gender equity, and wealth redistribution was crucial to formulating strategies for environmental conservation, and it also recognised that environmental limits to economic growth in industrialised and industrialising societies existed.

4. THE WAY FORWARD

If we are to meet the projected increase in demand for metals and minerals, new, highly transparent arrangements are needed that recognise the interests of mining companies and populations at local, regional and national level, balancing the use of land for mining against the claims of other industries, agriculture, urban development and ecological demands including water protection, forestry and recreation.

Mining is just one of many uses of land and social acceptance – social licence – cannot be assumed given the legacy of past mining when natural resource development was often accompanied by undesirable impacts on landscapes, on air and water quality, and on human and wildlife health and safety.

As part of the push toward sustainability, global, regional and local mining efforts must be pursued responsibly and efficiently to minimise damage to ecosystems and ensure accessible supplies for future generations.

More inclusive arrangements are needed to embrace individual applicant companies, national, regional and local government, local communities and other stakeholder groups, and aimed at delivering the Sustainable Development Goals. But who would broker such new arrangements? There are already many actors and arguably no need for new institutional arrangements. So the challenge is to use existing organizations and structures. But how does one encourage dialogue and cooperation? Much is already going on. The United Nations International Resource Panel (UNEP IRP: www.resourcepanel.org, last access: 22 July 2017) with the International Council for Metals and Mining (ICMM: www.icmm.com, last access: 22 July 2017) could develop and promote such arrangements as a best practice. Within Europe, there is a considerable body of work being done under the EU Horizon 2020 pro-

gramme. And the IUGS RFG initiative [Nickless, 2017] is an attempt by the geological community to reach out to others, to recognize the roles of academia in all its hues, and industry.

Ali et al. [2017] have argued that new linkages are needed between existing institutional frameworks to oversee responsible sourcing of minerals, trajectories for mineral exploration, environmental remediation and to raise consumer awareness of the impacts of consumption.

Development of renewable energy sources and other high technology applications will require new infrastructure that will consume a different mix of metals and minerals from current applications. Of major concern is a potential period when primary production may peak and start to decline before the social and capital infrastructure for secondary metal production will allow recycling to contribute substantially (Figure 2).

5. CONCLUSIONS

Notwithstanding fatigue that may result from too many treaties [Preston et al., 2015], the international community must actively plan for the next few decades when metal and mineral supply threatens to be inadequate. That planning needs to consider the vulnerable but flexible nature of metal and mineral resources and the global dependence on critical materials. Building on the work of the Brundtland Commission and the concept of intergenerational equity, decisions need to be made over what periods of time, whether decades or centuries, mining is considered to be sustainable bearing in mind that global human population continues to increase and probably will not plateau and decline until the end of this century [UN 2017]. A new international process is needed to mitigate the shocks of future mineral crises but currently no international agency has a mandate to plan, oversee or realise efficient and effective exploitation of metal and mineral resources. A start might be made by linking the UNEP IRP with the Intergovernmental Forum on Mining, Metals and Sustainable Development (IGF: www.igfmining.org, last access: 22 July 2017), under the auspices of the recently

established United Nations Environment Assembly (<http://www.unep.org/environmentalassembly>, last access: 22 July 2017) to consider:

- a) Seeking consensus on international targets for global mineral production;
- b) Monitoring impacts of mineral production and consumption;
- c) Supporting investment and research into new mineral exploration and extraction;
- d) Harmonising global best practice for responsible mineral resource development;
- e) Developing maps and inventories of the availability of recyclable materials;
- f) Developing a series of warning systems, based on rigorous analysis of data and covering risks such as geology, time lags, governance, technology, environmental, social, geopolitical and business.

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