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Mining

THE FORCES THAT SHAPED THE WORLD'S MOUNTAINS ALSO MADE THEM RICH IN MINERALS AND METALS. TODAY, INCREASING DEMAND AND ADVANCES IN TECHNOLOGY HAVE MADE EVEN THE MOST REMOTE MOUNTAIN AREAS ACCESSIBLE AND PROFITABLE FOR MINING. MINING CAN BRING LARGE BENEFITS TO MOUNTAIN COMMUNITIES; BUT IT CAN ALSO BE DEVASTATING TO FRAGILE MOUNTAIN ECOSYSTEMS, MOUNTAIN CULTURES AND THE ENVIRONMENTS AND COMMUNITIES BOTH ABOVE AND BELOW. THE CHALLENGE IS TO BALANCE MINING OPPORTUNITIES WITH ENVIRONMENTAL AND SOCIAL RESPONSIBILITY, AND TO ENSURE THE PROTECTION OF TRADITIONAL MOUNTAIN CULTURES.

BURIED TREASURE

Hundreds of millions of years ago, massive movements of the continents reshaped the earth's landscape, forming the Alps, Rockies, Andes, Appalachians, Pamirs, Himalaya and many more of the world's majestic mountain ranges. These same forces created deposits of metals and minerals in the rocks beneath the surface of the earth. That's why today's moun-

tain ranges are the major source of many of the world's most important metals and minerals, including gold, copper, iron, silver and zinc – all vital to the global economy. Mountains are also especially attractive to prospectors because the topsoil and overlying rock in many areas makes it easier to determine what lies beneath the surface.

RICH PICKINGS

As the global economy expands and demand for metals and minerals grows, mining companies are targeting the rich deposits in mountains more than ever before. Much of the extraction occurs in the developing world, but most of the products are used in the developed world. Half the world's tungsten, used in special steels, is mined in the mountains of southern China. Huge quantities of mined minerals and metals are shipped around the world.

Developed countries are the biggest importers of metals and minerals. Often, they have depleted their own resources, or mining has been curtailed

by environmental groups. The United States of America is the world's largest importer of metals and minerals – 70 percent of its nickel, chromium and tin come from abroad.

Latin America is currently the top destination for international mining companies, accounting for 29 percent of global investment in exploration. The opening of mining to foreign companies in the 1990s, the emergence of relative political stability, rich reserves and large tracts of unexplored land have made the mountains and highlands of many Latin American countries particularly appealing.

ENVIRONMENTAL CONSEQUENCES

Mining and the processing of minerals and metals can have dire environmental consequences for both highlands and lowlands. Moreover, because mountain ecosystems are exceedingly fragile, the degradation of mountain environments can be difficult and often impossible to rectify. The most serious environmental degradation issues in mining are: damage to water quality and quantity; loss of biodiversity and vegetative cover; and

the atmospheric effects of pollution and global warming.

The visual effects of mining are the most obvious signs of environmental disturbance – surface dumps, slag heaps, valley fills, trenches and open pits. Before mining can start, trees and vegetation must be cleared. In more isolated mountain sites, trees are sometimes felled to provide fuel for smelting.

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Key facts

▲ One-fifth of the world's zinc and lead comes from the Peruvian and Bolivian Andes, the Sierra Maestra of Mexico and the western ranges of the United States of America.

▲ The western cordilleras of the American continent account for almost half of the world's silver and most of the world's primary molybdenum, which is used to strengthen steel.

▲ Mining has the potential to make a dramatic contribution to the reduction of poverty. Botswana – a country where mining has accounted for most exports over the past 25 years – has had the highest rate of growth in per capita gross domestic product (GDP) in the world over the past two decades.

▲ Mined mountain regions are particularly susceptible to landslides. In 1992, about 500 gold miners and their families were killed at Tipuani, Bolivia, when rain loosened material and a landslide engulfed an Andean mining community.

▲ The International Labour Organization (ILO) Convention on Safety and Health in Mines (1995) has set the principle for national action on the improvement of working conditions in the mining industry. As of January 2002, 17 countries had ratified the Convention, and several others were working towards ratification.

EXPERT SOURCES

David Fox

Honorary Fellow at the University of Manchester and Consul for Chile in Manchester
22 Bollin Hill, Wilmslow
Cheshire SK9 4AW,
United Kingdom
Tel.: (+44) 1625528000
E-mail: david.fox@man.ac.uk

Dr Martin Grosjean

University of Berne, Switzerland
E-mail: grosjean@giub.unibe.ch

Olle Östensson

Chief, Information and Risk Management Section
Commodities Branch
United Nations Conference on Trade and Development (UNCTAD)
Geneva, Switzerland
Tel.: (+41) 22 907 5761
Fax: (+41) 22 917 0509
E-mail: olle.ostensson@unctad.org

Dr Jane Pratt

The Mountain Institute
Tel.: (+1) 5403384302
E-mail: dpratt@mountain.org
Web sites: www.mountain.org
www.mtnforum.org

LINKS

Messerli, B. and Ives, J.D. (eds).
1997. Mountains of the world – challenges of the 21st century.
www.cde.unibe.ch/pubmedia/72.asp#1D214

Community and Small-Scale Mining

www.casmsite.org

Friends of the Earth Mining Campaign

www.foei.org/mining/background.html

Global Environment Facility (GEF)

www.gefweb.org

Global Mining Initiative

www.globalmining.com

International Council on Mining and Metals

- The Toronto Declaration
www.icmm.com/uploads/1~finaljuly2.pdf

Mining Environmental Management

www.mining-journal.com

Mining Policy Research Initiative

http://www.idrc.ca/mpri/index_e.html

Mining, Minerals and Sustainable Development (MSSD) Project

www.iied.org/mmsd

UNEP - Mining

www.unep.org/pc/mining/index.htm

World Bank – Mining

www.worldbank.org/mining

World Conservation Union (IUCN)

www.iucn.org

Deforestation and mining activities cause soil erosion, increasing downstream siltation, floods, mudslides and landslides in areas below. In the Khaniara area of India's Himachal Pradesh, for example, nearly 1 000 small to medium-sized slate mines have stripped up to 60 percent of the forest and triggered countless landslides. In the Appalachian Mountains in the United States of America, so-called "mountain top removal," caused by open access to coal seams, has resulted in damage to streams and watercourses in many areas. Accidental spills of toxic metals used to extract ores have deprived farmers of drinking and irrigation water in mine sites from the Andes to the islands of the Pacific.

Massive quantities of waste may be left behind after mining is completed. Contamination of water by mountain mine

wastes can be especially serious because mountains supply most of our water for drinking and irrigating agriculture. Water pumped or drained from mines is often highly acidic and polluted with heavy metals and chemicals. Around the world, rivers have been pronounced biologically dead owing to the release of toxic minerals into their waters and the production of acid from the waste rock. In some mountain regions of Africa where mines are located, arsenic levels in water are 1 000 times the accepted standards.

Mining also causes atmospheric pollution. Surface mines can emit dust from blasting operations, haul roads and crushing during processing. Acid rain may be associated with the smelting of metals, while acid run-off from waste rock is a common consequence of mining.

THE HUMAN DIMENSION

Mining is frequently a hazardous occupation. The health and safety of miners and their mountain communities are at risk from a variety of factors, ranging from the inhalation of fumes and dust to water contamination and poor safety procedures.

Throughout the ages, the metals and minerals in mountains have been considered national assets, with little regard being given to the rights and needs of local people. Although mining can bring economic benefits to mountain dwellers, the benefits are often short-lived because mines are eventually depleted. Moreover, as mining has become more sophisticated, fewer jobs are available for low-skilled local workers. Too often, mining companies have failed to invest profits in local mountain communities, and sometimes people are deprived of their land, leading to increased poverty and food insecurity. Coal mining operations in the Appalachian Mountains a century ago, for example, forced thousands of farmers to abandon their homelands.

In many parts of the world, mountains are sacred sites and, especially their summits, have a spiritual significance for ethnic mountain communities. To some cultures, mining seems an act of sacrilege.

More than a dozen World Heritage sites identified by the United Nations Educational, Scientific and Cultural Organization are currently considered to be threatened or potentially threatened by mining operations and proposals.

Mining in remote areas can lead to serious social disintegration and disruption. Food, fuel, timber, machinery and other goods are often imported. And as mountains are generally sparsely populated, or lack the highly skilled human resources needed for modern mining, labour also needs to be brought in. The influx and presence of immigrant workers and goods can upset the social and cultural balance in traditional mountain communities. For immigrant miners the high altitudes, lower temperatures and often damp or excessively dry conditions make a dangerous job even more arduous. Many immigrant miners work long shifts for weeks or even months on end, far from their families who may live hundreds of kilometres away. For local communities, large numbers of transient workers often bring new and serious diseases and social problems, as well as distortions to the local economy.

PROTECTING FUTURE RESOURCES

Rehabilitation of land damaged by mining is a relatively recent notion, and one that has been slower to take hold in mountain areas which are far from the public spotlight. But as the rate of exploitation of the world's mineral wealth increases, so too does pressure to protect mountain ecosystems.

The adoption of new practices and

technologies is also helping to reduce the waste generation and environmental degradation caused by mining and the processing industry.

Some improved policies, practices and legislation have had positive effects, especially in areas mined by large transnational companies.

CONTACT



International Year of Mountains Coordination Unit
Food and Agriculture Organization of the United Nations
Viale delle Terme di Caracalla, 00100 Rome, Italy

Tel: (+39) 06 57055737

Official International Year of Mountains Web site: www.mountains2002.org
FAO Web site: www.fao.org