

Health

AN ECOSYSTEM APPROACH

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Tracking Health and Well-Being in Goa's Mining Belt

New tools promote the sustainable development of mining

A strong mining sector can provide “good” jobs and generate much needed revenue for cash-strapped governments. But it can also ruin landscapes and transform communities. In the Indian state of Goa, researchers supported by Canada's International Development Research Centre (IDRC) have developed a series of tools to assess the trade-offs. The goal is to ensure that the mining and mineral industry contributes equitably to the well-being of local people.



IDRC: Stephanie Colvey

Boom and bust: Indian researchers have developed tools to reconcile the harmful effects of mining activities with their tangible benefits.

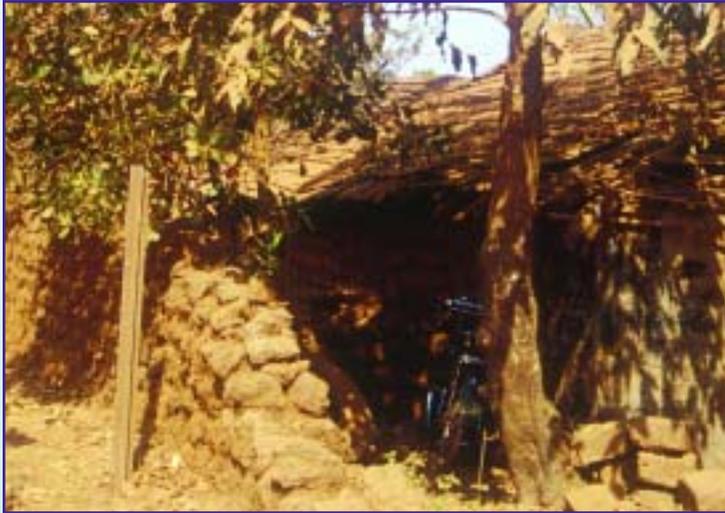
The Indian state of Goa is better known for its beaches and as a mecca for backpackers than as the backbone of India's iron ore industry. Yet, the mining belt that stretches across the middle of this tiny state accounts for 60 percent of the nation's iron ore exports. The contrast between the picture-

perfect beaches of the coast and the pockmarked landscape of the interior is stark. Open pit mining operations have left an indelible mark on the region: hills have been flattened, forests razed, and fields blanketed in silt run-off from waste sites and processing plants. Look beyond the fractured landscape, however, and you will see that jobs have been created, health and education standards have improved, and money spent locally has brought a measure of material wealth.

Goa's story is one that has been repeated in mineral-rich regions the world over where economic imperatives have pushed environmental concerns aside. Where this story differs, though, is in the steps being taken to change the narrative.

The search for balance

“Closing the mines because of their environmental impact is not an option for Goa,” says Dr Ligia Noronha of the Western Regional Centre of the Tata Energy Research Institute (TERI). “But there is a need to bring about some balance between the economic gains and the environmental losses to ensure greater sustainability for the region and local communities.”



IDRC: Stephanie Colvey

Roads of Goa's mining belt. It is a serious lung irritant that also stunts plant growth.

Finding ways to achieve that balance is the driving force behind the research in which TERI is now engaged. "Mining is one of those activities that really connects issues relating to people, development, and the environment," says Dr Noronha. "But its contribution — negative and positive — to health and well-being is poorly understood. More important, it's not well communicated."

As a result, local communities, governments, and mining companies are often uncertain about their respective roles and responsibilities in mining development, and they are unable to act or participate effectively in decisions related to mining activities. This is the information that Dr Noronha and the team she leads have sought to provide. The team includes economists, a biologist, a biochemist, an environmental geologist, a political scientist, and a specialist in health and social research statistics. They have developed a series of tools to measure the well-being of local communities and the surrounding environment. "By allowing changes in well-being to be measured over time, these tools can enable greater participation and conflict resolution. They can also improve decision making," asserts Dr Noronha.

Building local trust

"Early on, we understood that we needed a broad perspective for understanding well-being and its determinants, as well as a means of addressing the various realities of the people living and working in mining areas," says Dr Noronha. "We chose an ecosystem approach because it places an equal emphasis on concerns related to the environment, the economy, and the community in assessing the significance of an economic activity to human well-being. For us, it seemed the best way to go."

The TERI team also recognized that the active involvement of mining companies, state and local governments, and villagers in mining communities would be critical to arriving at workable solutions. "The main challenge," says Dr Noronha, "was convincing the groups that we did not have vested interests — that we were not out to close mines, to do people out of jobs or governments out of revenue, but to arrive at the shared understanding of the trade-offs and possibilities. Fortunately, things worked well and we received the full support of the local communities, industry, and the government during this project."

To overcome early skepticism, the TERI team launched a process they refer to as "multistakeholder issue development." Mining company representatives, government officials, and community members were involved in identifying and validating critical issues associated with mining, with developing and testing tools, and in resolving problems that arose as the project progressed. "The multistakeholder process was a central feature of our work," says Dr Noronha. "It ensured that the issues were acceptable to all the stakeholders, that it reflected their priorities, and that the issues left out were less important than those that were included."

The common set of core issues to emerge from this process were:

- land: its availability for mining operations and issues of compensation to farmers;
- environmental quality: concerns about the degradation of air, water, lands, and forests;
- post-mine closure: issues of unemployment, income potential, migration rates, alcoholism, and environmental cleanup;
- human and physical investment in the region: education, basic amenities, rent-sharing with locals, training opportunities, and health care facilities;
- social and community relations: nongovernmental organizations' interference, political interference, media under-reporting of problems, cosmetic attention to problems, and consultation; and
- effective administration: rule enforcement, goals achieved, and accountability.

Working from this core set of issues, the TERI researchers developed three tools for measuring the impact of mining activities and their effect on well-being: (1) a set of environmental and social performance indicators to measure the economic, environmental, and social costs of mining; (2) a "quality of life" instrument to assess the well-being of people in mining areas over time; and (3) an income-accounting tool to gauge the long-term economic viability of mining activities.

Assessing change

The purpose of environmental and social performance indicators is to measure trends. “Changes in indicators over time can then point to what is happening in the mining region, whether impacts are positive or negative, whether problems are growing or decreasing, and whether or not current policies are achieving desired goals,” says Dr Noronha. “They can also point out actions and areas of concern to the main stakeholders.”

The TERI team developed indicators for each of the stakeholder groups. For mining companies, for example, whether wastewater was treated and tailings water was recycled served as indicators of environmental performance. In villages, water levels in wells and rivers served as indicators of environmental quality. Because monitoring was done by government agencies, they also served as indicators of good environmental governance.

A pre-pilot test of the indicators was done with a few companies and the Goa Mineral Exporters Association to see if the language used was clear and to ensure that the indicators had policy relevance. Where testing showed that data for proposed indicators did not exist or would be difficult to obtain, those indicators were dropped from the final set. Examples of indicators that were dropped include the lowest wages paid by worker category, the number of patents filed, and worker retraining expenditures as a percentage of the total spent on all human resource development. Other indicators, not captured in the first round, were added: concerns of workers, for example, were included because they were seen as important to the mining companies, governments, and the communities in which the workers lived. The revised list of indicators was then field-tested and validated.

Monitoring quality of life

In developing the quality of life (QOL) instrument, the TERI team worked with focus groups of 10 to 12 people who represented a cross-section of the community and included members of the three stakeholder groups. “The purpose of the focus groups,” says Dr Noronha, “was to get comments and views on conditions that make life better or worse, and the conditions and processes that can change the life of local people and make it more positive. They also helped with the initial testing to ensure that the tool was valid and comprehensive.”

Versions of the QOL tool were piloted in Goa and in Mozambique to check for consistency and validity of results. The tool was then refined on the basis of feedback from field studies.

In Goa, the QOL instrument will provide stakeholders with a snapshot of how quality of life changes over time and at different levels of economic activity depending on whether mining is new to the area, well established, or in the process



IDRC: Stephanie Colvey

Positive change: mining companies now plant trees and build filtration walls to reduce erosion and trap dust around abandoned mine sites.

of closing down. This panoramic picture of changes over time can “suggest policies and promote improved industry and government practices that will lead to improved health and well-being of people,” says Dr Noronha.

Promoting sustainable development

The role of mining in sustainable development is one issue that decision makers and resource managers have wrestled with for decades. With the development of their income-accounting tool, the TERI researchers have attempted to show how mining activities, which have a finite life span, can be integrated with social and environmental concerns in a way that promotes long-term community development.

The approach adopted by the TERI team places a monetary value on the effects of mining, such as air and water pollution, loss of forests, groundwater depletion, mineral resource use, and reduced agricultural productivity. It also takes into account the direct and indirect benefits to society. In the case of forests, for example, this would include the economic benefits gained from the generation of marketable products and

A mining ecosystem

The ecosystem defined by the TERI team includes 57 villages in the Goa mining belt that the researchers grouped into four clusters. The clusters cover a continuum in the life span of mining communities from those where mining operations are new and very active to more mature sites that are closing down. Environmental and social characteristics are often correlated to where the clusters lie along this continuum. Thus, literacy levels and access to amenities, such as lighting, sanitation, water, and cooking gas, were higher where mining was the most active. These same areas also experienced the worst air quality as a result of dust from mining and trucking operations. These differences were significant for the research team. It meant that the tools they developed would have to be sensitive enough to discern these differences and allow for solutions tailored to the local reality.

the indirect benefits from watershed protection and other services. These environmental costs can be seen as an additional amount that should be contributed by the mining company to finance environmental rehabilitation using the "polluter pays" principle.

The team used similar accounting practices to place values on the health and social costs of mining. To ensure the economic viability of communities after the resource has been exhausted, money would be set aside to finance human and community development. This could help offset one of the main problems associated with mine closures: the lack of skills and resources for alternate economic development.

A step forward

The tools the TERI team have developed are not a panacea. For one thing they do not address the skewed power relationships so common in mining areas. "In Goa, mining is big business and mine owners are politically powerful," says Dr Noronha. "Mining is causing serious environmental problems, but few questions are asked."

She sees the development of these tools as a step forward in redressing this imbalance. "Mining companies are now aware and, more importantly, acknowledge that they have to act responsibly, that their activities are being monitored and assessed," states Dr Noronha. "Communities have informa-



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In some communities, mining companies truck in water to replace local sources polluted by mining activities.

tion, both positive and negative, about the activity and its impact in relation to certain societal goals or standards if they want to act toward improved conditions for themselves. And government officials know there is access to information if they want to use it to improve governance in mining regions."

This, she believes, can promote increased accountability and transparency in resource development.

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Ecosystem Approaches to Human Health

Human health and well-being are intimately tied to the health of the ecosystems that sustain life. Yet the potential for improving health by better managing the local environment is an avenue rarely explored in mainstream health programming. Through its Ecosystem Approaches to Human Health (Ecohealth) Program Initiative, IDRC aims to identify the web of economic, social, and environmental factors that influence human health. Communities can then use this knowledge to better manage ecosystems and improve the health of both people and the ecosystem.

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The International Development Research Centre (IDRC) is a public corporation created by the Parliament of Canada in 1970 to help researchers and communities in the developing world find solutions to their social, economic, and environmental problems. Support is directed toward developing an indigenous research capacity to sustain policies and technologies developing countries need to build healthier, more equitable, and more prosperous societies.

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