Report No. 39878-IN

India
Towards Sustainable Mineral–Intensive Growth in Orissa
Managing Environmental and Social Impacts

May 30, 2007

Environment Unit
Sustainable Development Department
South Asia Region

Document of the World Bank

ABBREVIATIONS AND ACRONYMS

APPCB	Andhra Pradesh Pollution Control Board
CES	Centre for Environment Studies
CII	Confederation of Indian Industries
CIL	Coal India Limited
CPCB	Central Pollution Control Board
CREP	Corporate Responsibility for Environment Protection
CTE	Consent to Establish
CTO	Consent to Operate
DES	District Environment Society
DGMS	Director General of Mines Safety
DIC	District Industries Centre
DOC	Direction of Closure
DoE	Department of Environment
DoF	Department of Forest
DoF&E	Department of Forest & Environment
DoI	Department of Industries
DoP&C	Department of Planning and Coordination
DoS&M	Department of Steel and Mines
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ERM	Environmental Resources Management
FDI	Foreign Direct Investments
FPC	Forest Protection Committees
FSI	Forests Survey of India
FUG	Forest User Groups
GDP	Gross Domestic Product
GIS	Geographical Information System
GoI	Government of India
GoO	Government of Orissa
HQ	Headquarters
IBM	Indian Bureau of Mines
IDCO	Industrial Development Corporation
IFC	International Finance Corporation
INR	Indian Rupees
IPICOL	Industrial Promotion and Investment Corporation of Orissa Limited
IRR	Internal rate of return
KPCB	Kerala Pollution Control Board
KSPCB	Karnataka State Pollution Control Board
L&M	Light and Medium
LAA	Land Acquisition Act
MCDR	Mineral Conservation and Development Rules
MDF	Minerals Development Fund
MGMI	Mining Geological and Metallurgical Institute of India
MoAs	Memorandum of Agreements
MoEF	Ministry of Environment and Forests
MoI	Ministry of Industries
MP	Madhya Pradesh
MPCB	Madhya Pradesh Pollution Control Board

MOU	Memorandum of Understanding
MPRDA	Mineral and Petroleum Resources Development Act
MT	Million Tons
NALCO	National Aluminum Company Limited
NGO	Non-government organization
NMP	National Mineral Policy
NTFP	Non Timber Forest Products
OMC	Orissa Mining Corporation
OPCB	Orissa Pollution Control Board
OSIMA	Orissa Sponge Iron Manufacturers Association
PADM	Pollution Assessment, Research, Development and Monitoring
PCB	Pollution Control Board
ISO	International Organization of Standardization
PNG	Papua New Guinea
PRI	Panchayati Raj Institution
R&R	Resettlement and Rehabilitation
RO	Regional Office
RTI	Right to Information
Rs.	Indian rupees
SD	Standard Deviation
SME	Small and Medium Enterprise
SOE	State Owned Enterprises
SPCB	State Pollution Control Board
TF	Task Force
UP	Uttar Pradesh
VAT	Value Added Tax

CURRENCY EQUIVALENTS

Exchange rate of the Indian Rupees for US$1.00

Fiscal year	Annual average rate (Rs)
2000-01	45.6844
2001-02	47.6919
2002-03	48.3953
2003-04	45.9516
2004-05	44.9315

FISCAL YEAR
April 1 – March 31

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ACKNOWLEDGMENTS

This report is the product of a collaborative effort between the World Bank and the Government of Orissa, under the overall guidance of the Department of Forests and Environment with significant support from the Department of Steel and Mines. We would like to especially thank Mr. S.P. Nanda, former Principal Secretary (Forest and Environment) and Mr. Bhaskar Chatterjee former Principal Secretary (Steel and Mines) for their support and guidance throughout the study. The team also acknowledges valuable inputs and collaboration by the Orissa State Pollution Control Board led by Dr. L. N. Patnaik, Chairman. Significant contributions by numerous participants from Non Government Organizations (NGOs) and mining and industry sector representatives at several meetings and workshops held at various stages of the study are gratefully acknowledged. The team is thankful to Mr. S. Pani former Chief Secretary, Mr. L.N. Gupta former Secretary (Steel and Mines), Dr. R.V. Singh, Special Secretary (Planning and Coordination) and Mr. H Panda, Principal Secretary (Forest and Environment) for their broad support and guidance during finalization of this report.

The World Bank team was led by Sanjay Srivastava and Kseniya Lvovsky, and included Richard Damania, Jane Nishida, Adriana Eftimie, Ranjan Samantaray, Priti Kumar, Genevieve Maria Dutta and Vinod Ghosh. Background surveys and studies for this report were provided by a team of consultants from the Environmental Resources Management led by Susheel Handa; RTI International led by Subhrendu K. Pattanayak; Carolyn Fischer and Verve Consulting led by Ashok Singha. The Centre for Environment Studies led by Mr. Jude Sekar, Director and Special Secretary (Forest and Environment), supported by Pragnya Bhattmishra and Bikas Mohapatra took lead in planning and publishing a quarterly news letter "Growth and Environment". Peer reviewers were Dilip Ratha, John Strongman and Fernando Loayza of the World Bank. Helpful comments were received from V.J.Ravishankar, Asya Akhlaque, Maitreyi Das, Sameer Akbar, and Tapas Paul. Jeffrey Racki, Acting Sector Director, South Asia Environment and Social Development Department; Michael Carter, former Country Director, Ms. Isabel Guerrero Country Director for India; and Fayez Omar, Senior Manager, India program, guided the overall effort.

EXECUTIVE SUMMARY

1. Orissa is rich in natural resources. It is endowed with an abundance of minerals, timber, marine resources, and a plentiful supply of water. The state is India's main supplier of numerous valuable minerals such as chromite, nickel ore, coal, bauxite, iron ore and manganese. About 30% of its area is under forest cover, which provides for the livelihood of a large and growing tribal population. It is also one of the richest biodiversity regions in India.

2. In the past several years, Orissa has emerged as a dynamic and reforming state that is poised to turn around its development fortunes, using as a major driver, an investment boom in the mineral sector and downstream industries. An initial set of reforms that has arrested fiscal deficit, improved governance and accelerated economic growth. Building on this success, the Government of Orissa (GoO) is developing and implementing a comprehensive vision and strategy for sustaining these achievements and ensuring lasting inclusive growth.

3. Given the substantial growth potential of the economy's natural endowments, there is little doubt that natural resources in general, and minerals in particular, will continue to play a prominent role in shaping the state's development. This increases the demand on the state institutions to enhance their capacity to manage the social and environmental impacts of a mineral-intensive growth strategy from a wide range of stakeholders. Given the legacy of insufficient attention to managing these impacts, it is particularly important to demonstrate a new, environmentally and socially responsible approach to promoting investments in mineral-intensive industries. An ambitious socio-economic development program of the GoO, which pursues a broad-based growth strategy, recognizes the need for stronger partnerships between regulators, developers and communities supported by strong institutions that shape the contours of development and future investments along which adverse social and environmental impacts are controlled and positive effects are reinforced.

4. The design of this study was informed by the recognition by GoO of a critical importance to develop a strong policy and institutional framework for ***sustainable and inclusive*** growth and of the critical role that closely interlinked environmental and social issues play in building broad-based public support for a mineral-intensive growth strategy. The study's objective was to support the socio-economic development program of the GoO by helping to analyze and formulate practical strategies for strengthening an institutional and regulatory framework with respect to managing the environmental and social impacts of investments in the mining and industry sectors. This study, conducted for about a year, focused on two sets of issues: (i) the need to create mechanisms to share the concentrated benefits of mineral-intensive investments across the community, and (ii) the need to address the externalities of accelerated mineral-intensive through improved enforcement and compliance of environmental and mining regulations. Significant attention was given to the capacity needs of the Orissa Pollution Control Board (OPCB), as the main agency to monitor and enforce compliance with environmental regulations and standards.

5. This analytical work was undertaken with strong support from the Department of Environment (DoE), the Orissa Pollution Control Board (OPCB), Department of Steel and Mines (DoS&M), and the Department of Industry (DoI). The study followed a consultative process with several focused group consultations and workshops with various stakeholders during the course of study period. A number of background studies and activities were undertaken, such as capacity needs assessment of the OPCB; assessment of biodiversity and socio-economic impact due to mining activities in select areas; and review of international experience in benefit sharing in mineral based economies. The study also contributed to environmental awareness creation through supporting a bi-monthly newsletter entitled

"Growth and Environment in Orissa". The newsletter was produced by the Center for Environmental Studies (CES) in Bhubaneswar.

MAKING COMMUNITY A DEVELOPMENT PARTNER THROUGH BENEFIT SHARING

6. Substantial progress has been made in establishing a comprehensive mining policy framework at the national level in India and at the state level in Orissa. The minerals previously reserved for exploitation by the public sector (iron ore, manganese ore, sulphur, chromite, gold, diamond, copper, lead, zinc, molybdenum, tungsten, nickel and platinum group of minerals) have been opened for private and foreign investment. Preferential rights of the private sector are now recognized for the grant of a mining lease, provided the party has carried out the actual prospecting. Important policy initiatives have also been taken to address the environmental and social risks posed by the sector, such as the mine closure notification by Government of India (2003), and the Resettlement and Rehabilitation (R&R) policy of the GoO (2006).

7. The mineral resource base in Orissa is mainly spread in the tribal community dominated districts. A pilot assessment of the impact of mine exposure on communities in Orissa, taken up under this study, suggests that further strengthening the policy framework and, particularly, the implementation mechanism is needed to ensure that the benefits of increased economic activity due mineral extraction fully reach the communities and are not offset by the externalities of mining such as the impacts on forest and water sources, on which the communities depend. The assessment also suggests that different companies have in the past practiced different approaches to peripheral development and environmental management within the same area, without a consistent framework, which reduced the effectiveness of good practices adopted by some companies. The analysis is based on a survey covering 600 households in the Koenjhor district with high concentration of mining activity featuring a mix of large and small mines. Its findings can not be directly extrapolated to other areas or new investments, or used to draw definite conclusions on policy prescriptions.

8. Nevertheless, the assessment underscores the importance of the efforts by GoO to ***develop more systematic mechanisms that extend the benefits of mining to the local communities living in and around the mining affected areas*** in terms of: (i) accelerating shared growth and job creation; (ii) developing appropriate mechanisms to increase flow of funds to local governments and/or tribal communities; (iii) improving public service delivery; and (iv) strengthening social protection. As a result of these efforts, (Orissa has now in place a progressive Resettlement and Rehabilitation (R&R) policy (adopted on May 14, 2006), which is more people-friendly than that of any other state. This policy stipulates rational criteria for compensating those directly affected by mining. The new R&R policy and a number of other important government initiatives to share benefits of the investment boom with local communities are major steps toward a comprehensive and systematic approach to addressing peripheral development issues and programs in mining areas that effectively balances interests of various players. To succeed, this process needs to be supported by strengthening institutions and implementation record at both the state and local level of government, in close cooperation and consultation with the target communities.

9. Establishing a comprehensive and operational peripheral development mechanism is inherently difficult because it requires balancing diffused interests against concentrated interests. It asks those affected by mining to trade the certainties of a known livelihood for the uncertainties of an unknown system. In principle, the mechanism should ensure the following types of benefits accruing to the local communities: (i) employment and income-related benefits; (ii) benefits aimed at building local human capital and institutional capacity; (iii) benefits for the community resulting from the development of infrastructure; and (iv) where necessary, special funds to sustain human and social capital accumulation.

10. The challenge, which is not unique to Orissa, is to find ways to ***operate these principles*** in a particular cultural, institutional and political setting. International experience, reviewed in this study, points to four key priorities that need to be addressed in designing a benefit sharing program. First, it is necessary to create mechanisms to ensure that legitimate community interests are adequately represented. Unless those affected by mining are legally empowered with adequate and transparent rights and safeguards, there remains a risk that (as in the past) communities will be marginalized, when industrial interests align with those of decision makers. This calls for far-reaching changes that give effective legal voice to communities through strengthened ***rights*** over development decisions. Second, it is important to deliver benefits in ways that are meaningful to communities and ***generate economic development that can be sustained beyond the (finite) life of a mine***. Third, the system must be credible and establish trust. If impoverishment or other adverse impact is the anticipated consequence of a mining project, then resistance can be expected to follow. Fourth, the mechanism must be sufficiently ***adaptable to accommodate diverse needs and interests***. This is particularly important for Orissa where the mining areas vary across a number of dimensions including: the type of mining activity, the number of mines, the size of mines, topography, density of population and the assimilative capacity of the environment. Thus situation rules out ***one-size-fits all*** approach; each case will involve a different set of actors and fine tuning the mechanism to meet community needs will require a system that elicits information and allows choice.

11. ***Negotiation and participatory approach are therefore preferable to prescriptive "top-down"*** approaches. A participatory partnership model such as the Papua New Guinea Development Forum provides a promising template that can be adapted to different circumstances. The forum acts as a venue for information sharing and establishes the manner in which benefits from the project are shared. This approach involves communities, government and the mining company who enter into legally binding Memorandums of Agreement that spell out the forms and level of benefits from a specific mining project that will reach the local community. The mechanism is therefore inclusive, with stakeholders being part of the process and making informed decisions, based on communication, consultation and negotiation. That the agreement has legal underpinnings makes it credible and offers a way of bridging the trust gap.

12. ***The manner in which benefits are shared is another important dimension.*** There are clear advantages to providing benefits through public goods that leave durable development outcomes and promote economic independence. Payment of cash is most likely to induce immediate consumption instead of investment and additional income will tend to substitute for labor supply. Cash payments are usually one time payments and should be the last resort in areas that lack service delivery capacity, or where trust of local institutions remains weak. The ultimate goal of any benefit sharing agreement is to transform the community from being a beneficiary to becoming a stable and reliable partner.

13. In areas with multiple small industries such as sponge iron plants and mines, capacity constraints might limit the ability of small companies to engage in any meaningful benefit sharing. Reportedly, these small companies have been unevenly and partially implementing the peripheral development policy, generally under pressure from local administration or community. Therefore, in such cases, there is a need to establish mechanisms to pool resources from different firms to address collective action problems – an approach supported by GoO. Under this approach, local governments are expected to play a more active role in service delivery; it would be necessary to match their capacity with these additional commitments. On the other hand, where a single large industry or mine dominates the landscape and local government capacity is over-stretched, it is more likely that the company would take responsibility for providing benefits in the form chosen by communities. However, this approach does not ensure sustainability in the long term. Mining is a temporary activity and if the necessary conditions for sustainable development are not created after closure, the affected community would end up in a worse situation.

14. ***Determining how much to share is another delicate issue*** that involves balancing community needs against available public funds and corporate profits. Excessive demands on corporations would be counterproductive and would erode investment. An approach based on voluntary negotiation between the company and the community, with the government playing the role of a facilitator, provides one solution. This approach, however, would be complicated in the situation of many players and companies, typical in many areas of Orissa. Furthermore, considerations such as overall fiscal regime for mining, revenue sharing arrangements between central, state and local government, and the effectiveness of public service delivery mechanisms will all play a role in arriving at an appropriate solution in a particular context.

15. Overall, the analysis and consultations in the course of the study indicate ***the need for a flexible approach to benefit sharing that can be tailored to local needs*** and accommodate diverse industry structures and management capabilities, based on negotiation and voluntarism. In developing locally-specific schemes, the following considerations are useful:

- Meaningful community representation calls for awarding greater rights to affected parties over development decisions that affect their livelihoods. The Development Forum approach will most likely succeed in small and relatively homogenous communities (such as in many tribal communities), mainly exposed to mining activities by one large company.
- Pooling resources to address collective action problems may be effective in areas with multiple small scale mining.
- Providing benefits through public goods that leave durable development outcomes and promote economic independence should be seen as first preferred option, while cash payments may be the last resort in areas that lack service delivery capacity, or where trust of local institutions remains weak.
- In case of a large mining company in an area where local government capacity is over-stretched, the company could take responsibility for supplying benefits in the form chosen by communities. It is important, however, to put arrangements in place that will gradually build the capacity of the local government and moderate community dependency on the mining company.

16. Following the Government of India notification 2003 about mine closure, further actions to develop successful practices are needed with respect to ***the environmental problems associated with abandoned and orphan mines.*** In the case of Orissa, most of the abandoned mines have naturally been converted into rainwater storage tanks, but the water is often contaminated which reduces its usefulness even in times of drought and pollution problems occur through acid rock drainage. Mitigation of the environmental impacts of mining and the progressive rehabilitation of the affected surface area is fundamental to modern sustainable mining. It helps in retaining the "social license to operate" implicitly conveyed by the communities most impacted by the mining operation. Enforcement of Environmental Impact Assessments (EIAs) and agreed Environmental Management Plans (EMPs) are an essential part of this social compact, and will be especially important in Orissa with its high population density and intense competition for rural agricultural land.

17. ***Planning for closure can generate benefits at two levels.*** *First*, at the level of the local community or region; and *second*, at the level of the mining company. A forward looking approach can simultaneously involve developing viable economic alternatives, transforming mined land for productive purposes such as for growing cash crops, and possibly timing new mining projects in the region.

18. The lessons of local and international experience, outlined above, are expected to help GoO, in consultation with other stakeholders, to build on the recent initiatives and continue developing an effective framework for negotiation with community and broad-based peripheral development. This

would require a long-term commitment. The Development Forum is now successfully practiced in Papua New Guinea but it took almost 20 years of effort. Nurturing overstretched government institutions to ensure that policy promises are matched by policy implementation takes time, too. Past experience also plays an important role in shaping expectations. Thus, it is critical to put a major effort into building a good implementation record with new initiatives, such as the R&R policy, which should include consistent delivery of payments in full and in time and meaningful consultations. In addition, new approaches to peripheral development need to be complemented by improving enforcement and compliance with environmental and forestry regulations, which have often been at the root of controversy and social tension over mining projects.

19. It should be worthwhile to extend and detail an empirical analysis of the impact of mineral based sector development, initiated by this study on a pilot basis, to other areas with different mix of mining and related downstream companies and communities, to provide a fuller picture of the benefits and impacts, and community needs. The findings could be used for guiding the design of peripheral development plans. Given the significance of and close linkages between the environmental and social issues in mining development, a strategic environmental and social assessment of the mining sector would be a useful tool to support the formulation of a sustainable mining development framework.

STRENGTHENING INSTITUTIONS FOR ENVIRONMENTAL MANAGEMENT

20. Mineral-intensive growth is known to create significant environmental externalities and requires strong environmental institutions to effectively reconcile the need for further investment with environmental protection. An example of this challenge can be seen from a ban by GoO on locating new sponge-iron industries in six sensitive blocks of the state, namely, Kuarmunda, Lathi Kata, Rajgangpur and Bonaigarh in Sundergarh district; and Jharsuguda and Rengali blocks in Sambalpur district, that have seen growing levels of public complaints due to increased air pollution. In this context, this study undertook ***an assessment of the effectiveness of the existing regulatory and enforcement tools and of the capacity needs of the OPCB*** to perform its primary tasks in a situation of rapid growth trajectory and expected massive investments in pollution-intensive industries. The assessment focused on identifying, jointly with the DoE and OPCB and in consultation with DoI as well as NGOs, specific measures for strengthening: (i) policies, processes and procedures to enhance compliance and enforcement of environmental regulations, (ii) capacity of the environmental regulator (mainly OPCB), and (iii) public consultation and participation. The key identified issues and ways to address these are summarized in the following paragraphs.

21. Considerable progress has been made in establishing the environmental regulatory framework in Orissa. However, much remains to be done to further strengthen application of the regulations, procedures, mechanisms and practices in monitoring, compliance, and enforcement. Among the various governmental institutions, the OPCB plays the main role in ensuring compliance with environmental laws and regulations, particularly in the industry and mining sectors. The OPCB is planning important initiatives with regard to improving the consent management system, increasing environmental compliance in the regulated community, promoting effective public participation, and decentralizing environmental functions to the regional offices.

22. ***Improving the effectiveness of environmental consent management and performance monitoring***. Currently, a significant number of small industries and mines are not covered by the environmental consent management system — a situation observed in many states. An inventory of all mines and industries operating in the state needs to be performed by OPCB, cross checking and harmonizing the lists of licenses or registration with the consent database. Once the inventory is completed, an amnesty program could be established to encourage unregulated units to come into the system while an aggressive inspection campaign should be implemented for those who do not come

forward. On the other hand, while the regional offices of the OPCB have been given a greater role in consent, monitoring and inspection functions, they are facing serious capacity constraints in a time of increased decentralization and exponential workload that is expected with the growth of new investments in the state. A periodic assessment of workload, capacity and resource needs would be required to better support and ensure performance at the central and regional offices.

23. ***Strengthening enforcement tools and compliance incentives.*** As highlighted by the National Environment Policy (2006), ability of state enforcing agencies, such as OPCB, to enforce regulations is constrained by the lack of adequate enforcement deterrents and compliance incentives to promote good environmental behavior and discourage willful defaulters. To overcome this systemic problem, the OPCB has adopted, on a pilot basis and following the successful experience of West Bengal, *a Bank Guarantee* instrument (conditioning the renewal of CTO for willful defaulters on a Bank guarantee that is forfeited in case of a failure to meet the CTO performance targets) as a tool to strengthen enforcement deterrents. It is important to evaluate and expand the use of this promising measure, which is particularly suitable for high risk large industries, as well as continue exploring other enforcement mechanisms that have been successfully adopted by some SPCPs. Recognizing that regulatory enforcement alone may not suffice in dealing with Small and Medium Enterprises (SME) sector, innovative regulatory programs and approaches are required for these sources. Such approaches should combine greater involvement of citizen and local government in monitoring and enforcement with *extensive compliance assistance* in the form of knowledge on best practices, capacity building, and financial aid targeting polluting small scale sector (such as sponge iron plants, brick kilns, stone crushers etc) or sensitive areas.

24. ***Improving public participation for a shared vision of growth.*** Affected communities are principal stakeholders of environmental management that are increasingly demanding greater accountability for environmental impacts, and increasingly resorting to public interest litigation. In addition to and as a way of strengthening the effectiveness of public hearing process (renamed as "public consultation" by the new EIA notification, 2006), it would be important to develop "community participation" programs by DoE and OPCB aimed at educating and pro-actively communicating with community stakeholders on the impacts and benefits of the proposed development activities. Such programs could involve smaller and more frequent meetings with communities, prior to a "formal" public consultation, and interactive approaches to educating the public through training sessions and the publication and dissemination of regular environmental updates. It could also entail designating regional officers to work with the community to better understand local concerns, and adoption of user friendly procedures to ensure the fullest access to information under the Right to Information Act. It is also important to expand programs for involving citizens in environmental monitoring, building on a reportedly successful OPCB experience of the five "watch-dog" committee involving a community representative, particularly for small industries and mines.

25. ***Enhancing the Role of Mining and Industry Institutions.*** The role and involvement of industry and mining sector institutions will continue to determine environmentally sound behavior of industries and mines. For example, a promoter's decision on site location, land or choice of technology that are crucial determinants of environmental performance during operation are generally taken in consultation with sector agencies during planning stage, when environmental agencies are not engaged, thus missing the opportunity to minimize the environmental impacts at lowest cost. Ensuring enforcement of environmental regulation is a shared responsibility of the OPCB and other regulatory sector agencies that directly or indirectly influence the environmental management during operational stages. For instance, identification of environmental concerns, implementation of environmental management plan and monitoring of emissions and mine closure plans is a shared responsibility between OPCB, IBM, and DoS&M. There is a need to improve cross-sectoral coordination in managing the environmental impacts of pollution-intensive investments. The first step could be sharing of information between agencies

through development of inventories and joint inspection protocols to ensure greater compliance with both environmental and mining regulations.

26. It is also important to demonstrate to sector agencies, using real-life examples from rapidly growing good practice examples of corporate responsibility in India, that environmental regulation should not be seen as a barrier to investment but as an opportunity to improve efficiency, technology and management of a development project and get public support. A judicious mix of incentives and penalties linked to environmental performance and supported by the sector agency, such as IPICOL (building on examples of environmentally-sensitive industrial policies as found in states like Maharashtra and Gujarat), could significantly facilitate environmental compliance and performance.

THE WAY FORWARD: RISING TO THE CHALLENGE

27. Four key areas of institution strengthening that are critical to enabling sustainable and inclusive growth, envisioned by GoO, have been identified in this report: (i) developing mining regulators capacity to manage environmental and social performance of the mining operations; (ii) strengthening enforcement tools and incentives for environmental compliance; (iii) enhancing capacity of the OPCB to meet the demands of a growing economy; and (iv) improving public consultation and participation. The following ***specific priority actions have been identified, in consultation with the Government and other stakeholders, to be undertaken in the short-to medium term:***

(i) Further building capacity of mining regulators to manage environmental and social performance of mining operations:

- Undertake baseline assessments (including strategic environment and social assessment and mineral resources assessment) and priority action planning to support the preparation of the sustainable development strategy for the mining sector, and specifically facilitate rational land use planning, community development and benefit sharing of local and tribal peoples, and the dual use of designated forest areas with progressive rehabilitation and reforestation;
- Develop procedures and mechanisms for environmental compliance, mine closure, and addressing legacy issues by different categories of mining operations;
- Prepare guidelines for proper consultation, community development planning and benefit sharing, including a pilot development plan/benefit sharing scheme in selected mining areas; and
- Strengthen mineral sector agency capacity, primarily at level of district mineral administration through training, process enhancement and equipment renewal, based on needs assessment.

(ii) Strengthening mechanisms and incentives for compliance:

- Expand the scope of environment management by bringing unregulated industries and mines under the consent framework through an inventory of industries and mines (both operational and abandoned), in coordination with DoI, DoSM and IBM;
- Strengthen incentives for compliance, such as greater use of the bank guarantee system based on its evaluation, for large and medium industries with hazardous processes, or compliance assistance schemes targeted at small scale industries;
- Improve procedures and mechanisms for monitoring, inspection and enforcement for polluting industries and mines, building on experience with "watch dog" committees and successful initiatives by other SPCBs;
- Enhance cross sector coordination through agreed protocols for joint inspection, information sharing, and monitoring on environmental issues in industry and mining sectors; and

- Incorporate environmental considerations in the planning process by requiring that zoning atlas be used to determine the most suitable areas for investment and zones for new industrial and mining projects.

(iii) Enhancing human and technical capacity of the OPCB

- Strengthen the capacity of the central office and particularly regional offices through operational review, more effective staff training and improved use of information technology;
- Reassess its mandate in line with Water and Air Act provisions and develop a plan for outsourcing activities which do not involve legal obligation; and
- Introduce a periodic assessment of capacity and staffing needs in view of growing workload, resulting in a staffing plan by OPCB that takes into account all possible efficiency gains and focuses on filling the remaining critical staff shortages.

(iv) Improving public participation

- Develop and undertake a sustained environmental awareness program starting with environmentally sensitive industries and mines by partnering with industrial and mining associations and government corporations/bodies;
- Increase accountability for involving local government and respected community leaders early in the planning process and develop programs for engaging the community through the regional offices;
- Strengthen the public hearing/consultation process by providing specialized staff training on effective public participation techniques and skills, and use facilitators, professional or community, to bridge the communication gap; and
- Consistent with the Right to Information Act, improve the collection, storage, and updating of information to ensure a comprehensive environmental database with access by the public and across sector agencies, including developing user friendly procedures for information dissemination.

28. ***In conclusion,*** rapid growth that is projected for Orissa brings promising future opportunities for economic development and poverty reduction. To benefit from these opportunities requires, among other reforms, the effective management of environmental and social impacts of mineral-intensive growth. The challenge is enormous given the legacy of insufficient attention to these issues in the past, the scale of expected new investments, and capacity constraints of government and community institutions. The government has embraced a broad-based growth agenda, and is moving forward in a more environmentally and socially responsible manner than in past, demonstrated by a series of recent initiatives. Building on this momentum, the study has developed, through analysis and extensive consultation with GoO and other stakeholders, a set of specific recommendations to improve environmental management and social integration that can pave the way for an enabling framework for inclusive and sustainable growth.

1. INTRODUCTION

I. THE BACKGROUND

1.1 Orissa is rich in natural resources. It is endowed with an abundance of minerals, timber, marine resources, and a plentiful supply of water. The State is India's main supplier of numerous valuable minerals such as chromite, nickel ore, coal, bauxite, iron ore and manganese About 30% of its area is under forest cover, which provides for the livelihood of a large and growing tribal population. It is also one of the richest biodiversity regions in India and thus presents an important challenge for government, community and investors alike from the point of view of ensuring long term sustainable development.

1.2 Orissa has recently begun to turn around its development prospects and has emerged as a dynamic and reforming state, despite being one of the poorest states in India. Apart from a wave of domestic and foreign investment in the mineral sector and the downstream industries, fueled by surging demand for steel and other mineral products on the domestic and global markets, there are signs of accelerated growth in agriculture, allied industries, construction and services. Given the substantial growth potential of the economy's natural endowments, there is little doubt that natural resources in general, and minerals in particular, will continue to play a prominent role in shaping the state's development. This increases the demand on the state institutions to continue strengthening their capacity to manage the social and environmental impacts of a mineral-intensive growth strategy. Insufficient attention to managing impacts on the environment and the social fabric observed in the past has reflected adversely on public support for reform and private investment needed for accelerating growth. An ambitious socio-economic development program of the Government of Orissa (GoO), which pursues a broad-based growth strategy and has already met with initial success, recognizes the need for stronger partnership between regulators, developers and communities supported by strong institutions. Such a partnership would shape the contours of development and future investments along which adverse social and environmental impacts are controlled and positive effects are reinforced.

II. THE STUDY

1.3 This study was initiated in response to a recognition by GoO and other stakeholders that environmental and social risks of mineral-intensive growth are closely interlinked, and therefore, developing strategies to carefully manage and mitigate the harmful environmental effects is critical for enabling rapid, sustainable and inclusive growth in Orissa. The study aimed to support the growth objectives of the GoO by helping to analyze and formulate practical strategies for managing the environmental and some social impacts of rapid growth, with a focus on the mining and industry sectors. Specifically this study is aimed at:

- Assisting the GoO with improving the effectiveness of environmental institutions, procedures and processes;
- Supporting the development of a broad-based partnership between stakeholders for improved environmental management and compliance;
- Identifying critical institutional and technical capacity needs to manage the environmental implications of growth, particularly in the mining and industry sectors; and
- Assisting the mining regulators to improve environmental compliance of the mining industry and develop a benefit sharing framework to address social risks.

1.4 This analytical work was undertaken with strong support from the Department of Forests and Environment (DoF&E), the Orissa Pollution Control Board, Department of Steel and Mines and Department of Industries. The analytical work to support the development and implementation of government policies that promote environmental sustainability and sustain livelihoods, was combined with raising awareness and forging dialogue among diverse stakeholders on sustainable development issues. The study followed a consultative process with several consultation workshops conducted with various stakeholders during the course of about one year. A number of background studies and activities outlined below were undertaken that are summarized in this report and form the basis for recommendations on institutional and policy measures to guide a flexible and efficient response to current and future environmental and related social concerns in key growth sectors. The main background studies included:

- Institutional needs assessment of Orissa Pollution Control Board, particularly with respect to monitoring compliance and enforcement with environmental regulations;
- An assessment of biodiversity and socio-economic impact due to mining activities in pilot areas; and
- Review of international experience with benefit sharing in a mineral-intensive economy.

1.5 The study also supported a pilot program for environmental awareness creation with the help of a bi-monthly environmental newsletter titled, **Growth and Environment.** The newsletter has been produced by the Center for Environmental Studies (CES) in Bhubaneswar. Due to its relevance and easy access, it helped create a platform for public discussion in a short time and generated healthy debate among various stakeholders about developing creative solutions to Orissa's environmental problems, through consensus-based approaches that integrate economic, environmental, and social objectives.

III. THE REPORT STRUCTURE

Apart from the introductory chapter, this report has four chapters. These are:

Chapter 2: Environmental and Social Challenges of Mineral-intensive Growth in Orissa, This chapter summarize the challenges and needs of a mineral intensive growth strategy with regard to ensuring environmentally sustainable and socially inclusive growth.

Chapter 3: Managing the Environmental and Social Impacts in the Mineral Sector. This chapter outlines the key elements and principles of a regulatory framework that is needed for managing the environmental and social risks in the mineral sector and enhancing peripheral development, and identifies areas for further strengthening this framework in Orissa.

Chapter 4: Strengthening Environmental Institutions to Support Rapid Growth. This chapter focuses on identifying priority areas and specific measures for strengthening the enforcement and incentive framework for environmental compliance in the context of a rapidly growing economic activity, including mineral- and pollution- intensive industry. It also outlines capacity needs and an action plan for the OPCB to keep pace with increasing workload and mandates due to rapidly growing number and changing composition of pollution sources.

Chapter 5: A Way Forward. This concluding chapter summarizes the key findings, messages and recommendations.

2. ENVIRONMENTAL AND SOCIAL CHALLENGES OF MINERAL-INTENSIVE GROWTH IN ORISSA

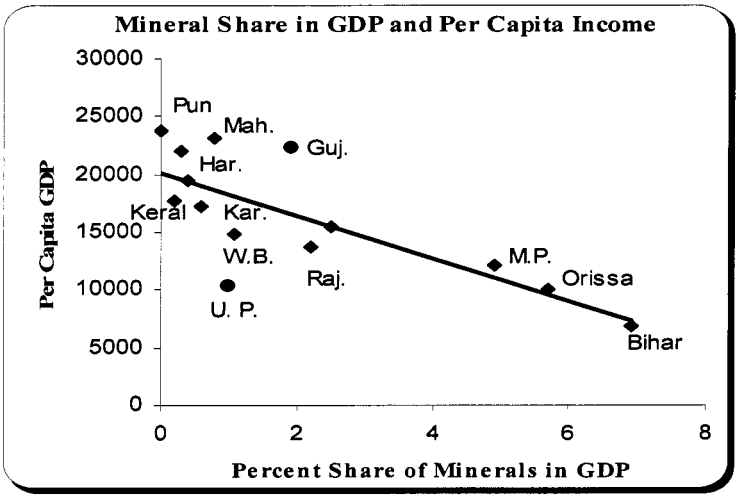
2.1 After lagging economic performance for over two decades, Orissa now stands at the crossroads of success. With the recent boom in the prices of mineral-intensive products, it has become a favored destination for much of the country's foreign and domestic investment in steel, aluminum and other mineral-intensive manufacturing industries. The government has undertaken an initial set of reforms that have arrested fiscal deficit, improved governance and accelerated the rate of growth. It is developing and implementing a comprehensive vision and strategy to sustain these achievements, further accelerate growth and make it more inclusive. This presents the state with an opportunity to capitalize on its natural wealth and build a prosperous economy where growth benefits are shared equitably among all its citizens. The aim of this chapter is to identify some of the generic challenges to converting these investments into inclusive growth and set the context for the following chapters that develop a set of recommendations with respect to supporting sustainable mineral-intensive growth in Orissa.

I. MINERALS AND GROWTH: EMPIRICAL EVIDENCE

2.2 For an insight into the role of minerals in the growth and development process, it is useful to examine the experience of different sates in India. Figure 2.1 provides a simple plot of per capita state income (State Gross Domestic Product) and the share of mineral production in State Gross Domestic Product.

2.3 Two broad clusters of states emerge. There are states like Bihar, Madhya Pradesh and Orissa that have a high level of reliance on mineral resources, but lower per capita incomes. The other cluster contains the growth successes such as Tamil Nadu, Maharashtra and Gujarat that have low levels of mineral dependence and higher per capita incomes. Other measures of development produce an identical pattern – the states with higher shares of minerals in GDP have consistently poorer human development index scores, lower growth rates and higher levels of mortality, malnutrition and morbidity.

Figure 2.1: Mineral Intensity correlated with poor performance

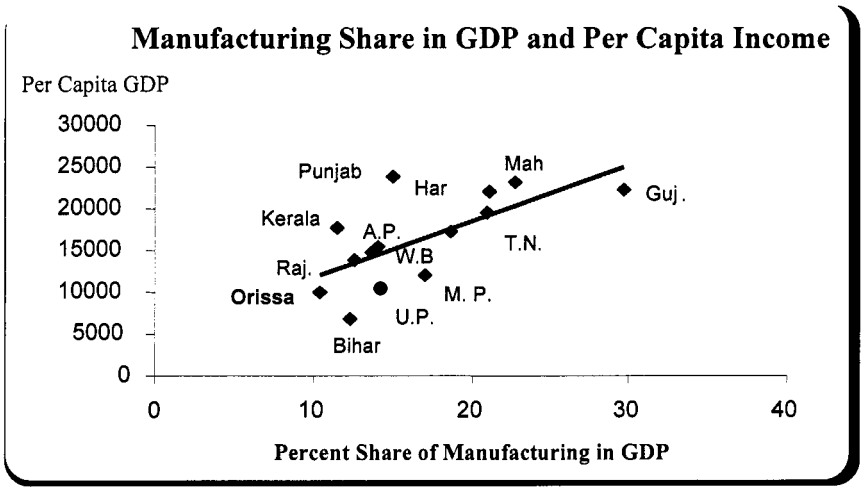


Source: Authors' calculations based on data from Indiastat (www.indiastat.com)

2.4 But there are some notable anomalies too. Gujarat and Rajasthan have similar shares of minerals in GDP and yet Gujarat's per capita income (GDP) is almost twice that of Rajasthan. Maharashtra and UP have comparable shares, but per capita income in Maharashtra far outstrips that in UP.

2.5 The reason to this anomaly is presented in Figure 2.2 which relates economic performance of each state to the relative size of its manufacturing sector. Yet another interesting pattern emerges. States with a greater dependence on manufacturing have higher per capita incomes. This also explains the diverging performance of some mineral dependent states in Figure 2.3. The larger manufacturing base in Maharashtra and Gujarat accounts for their success over Rajasthan and UP. Comparing the two figures it is also clear that on average states with a greater share of minerals in GDP also have a smaller manufacturing base. Orissa, Bihar and Madhya Pradesh are more mineral dependent and have a restricted manufacturing base, while Maharashtra, Gujarat and Tamil Nadu have a low level of mineral dependence and a larger manufacturing sector. The latter group is also among the country's strongest performers. It appears that greater access to minerals creates a particular challenge for - and requires special government attention to- the development of strong and diverse manufacturing base.

Figure 2.2: Size of manufacturing is strongly correlated with success



Source: Authors' calculations based on data from Indiastat (www.indiastat.com)

2.6 Global development patterns also confirm that a high level of mineral dependence, without developing forward and backward linkages with other sectors of the economy, retards economic performance. In particular countries that are dependent on point resources – i.e. resources extracted from a narrow geographic base such as minerals – perform poorly across a range of development indicators. This phenomenon is so widely and commonly observed that it has been labeled the "resource curse". ***But this outcome is neither inevitable nor unavoidable.*** Several developed countries such as Australia, Canada, Norway, and the USA have successfully harnessed their mineral wealth to build modern, productive economies. In the developing world too, countries as diverse as Chile and Botswana have used minerals to generate growth and development.

2.7 Why does mineral wealth impede development in some economies and not in others? There are several reasons, but there is a broad consensus that turning minerals into engines of development are particularly demanding on governance and institutions In particular, the mineral sector is typically capital intensive; so there is a need to promote job creation in other sectors. Further, the sector generates

significant negative externalities, so there is also a need to invest heavily in the regulations and institutions to control negative downstream impacts.

2.8 Recognizing these challenges, the GoO has developed and is implementing a broad based growth strategy spreading across mineral-intensive industry, agriculture and forestry, manufacturing, knowledge industry, IT, tourism, etc. In support of this strategy, this report specifically focuses on the issues related strengthening institutions to manage the environmental and social impacts (externalities) of mineral-intensive growth.

II. MINING AND EXTERNALITIES

2.9 Most of Orissa's mineral deposits are in forests that are inhabited by tribal populations, who are heavily dependent on forests for livelihood and have lower adaptive capacity to economic and social changes. Mineral extraction often leaves an "ecological footprint" which may adversely impact on these communities, their economic landscape and the environment (see Box 2.1). Addressing these impacts is a prerequisite for ensuring sustainable and inclusive growth and sustaining the momentum of economic reforms.

2.10 This is especially important given the scale of the proposed new investment in heavy industries. In two pollution-intensive sectors – iron/steel and alumina – the proposed expansion involves a 35-fold increase in steel production and three-fold rise in alumina plants. An expansion of such magnitude calls for compensating policy and institutional adjustments to address three main concerns (*i*) the infrastructure that is needed to support investment on this scale, (*ii*) land clearance and resettlement issues, and (iii) the risks from pollution. Indeed, these are among the top policy priorities for GoO.

2.11 It should be added that there are examples of socially and environmentally responsible investment and community development activities, such as those by NALCO and Tata companies. However, these are voluntary initiatives by specific companies not amounting to a systematic effort. There is an urgent need for ***a comprehensive policy framework*** for attracting responsible investors, facilitating peripheral development and protecting the environment. The GoO has now started putting this in place.

Box 2.1: Mining in the Koenjhar district: limited empirical evidence of impacts

To obtain some empirical evidence of the impacts of mines, a pilot assessment of mining on communities was undertaken in the Koenjar district of Orissa. A survey covered 600 households in two blocks - Joda block with a high concentration of mines of different size, status and management practices that was specifically chosen because of the presumed magnitude of problems, and Keonjhar Sadar block, which is likely to be mined in the near future. Importantly, this small assessment in a purposely selected area can not be directly extrapolated to other mining areas or new large-scale mining investment.

All the sample villages fall within the "Peripheral Development Zone" of 50 km from the mining area and were selected systematically to ensure sufficient variation and representation of different social groups, especially scheduled castes and tribes. The survey found that mining brings benefits to nearby communities – mainly in the form of better access to roads and the greater stimulus to economic activity that roads generate. Households in Joda that are closer to mines appear to have higher wage incomes and purchase more consumer goods. On the other hand, households in Keonjhar Sadar, currently less exposed to mining activities, fared better on several indicators, including education levels, access to clean water, reported illness, production assets and total cash income.

The findings illuminate the critical importance of GoO efforts to improve mechanisms to share the benefits of mineral development with local communities and negate the risks of exposure to mining externalities.

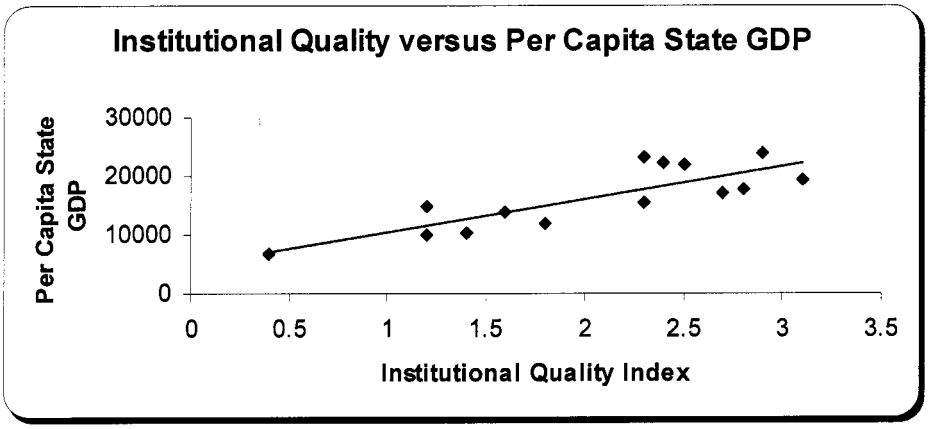
Source: Survey and analysis undertaken by the study, see Annex 3 for more detail.

III. INSTITUTIONS: THE DRIVERS OF DEVELOPMENT

2.12 Growth-enabling institutions facilitate investment, encourage technological change, and play an important role in shaping the contours of development along which negative impacts are controlled and positive effects are reinforced. Hence, institutions rather than resources are the key drivers of growth in most countries.

2.13 Data on the institutional performance of the Indian states is highly fragmented; hence, there is no simple and objective way to measure institutional productivity. But on a variety of indicators, the performance of institutions across the states of India follows the patterns observed elsewhere. Figure 2.3 provides a simple plot of institutional strength (based on IMF data against per capita state GDP and shows that states with strong institutions perform better.

Figure 2.3: Institutions and Development



Source: Authors' calculations based on data from Indiastat (www.indiastat.com) and IMF calculations from Kochhar et al (2006)

2.14 Whether the mineral-intensive investment boom delivers on best expectations in Orissa will ultimately depend on the capacity of its institutions to address the entire range of challenges and needs - economic, social, and environmental. As a corollary, mineral-intensive development in countries with strong and accountable institutions has produced positive outcomes (e.g. Botswana and Australia). Where institutions are weak, similar developments have had negative outcomes (e.g. Sierra Leon, Nigeria and Venezuela).

2.15 A review of the diversity of outcomes indicates that there is no single recipe for success, but there are certain common themes. Norway and Australia's strong accountable institutions ensure that minerals are exploited judiciously, environmental impacts are minimized and the windfalls are used to sustain broad based development. In the developing world, Botswana and Chile both have robust institutions that recycle mineral rents from a narrow beneficiary base to the wider community. The success stories have all built institutions to ***address the externalities*** **and** ***distribute the benefits*** of mining in a broadly acceptable way.

2.16 Faced with these challenges and choices, Orissa has embarked on a bold and comprehensive social and economic reform program, aided by the World Bank and other agencies. It has demonstrated its commitment and ability to tackling difficult policy and institutional reforms by restructuring the inefficient power sector, reducing the size of its fiscal deficit and enacting a range of reforms to improve efficiency of its civil service. The GoO has also promoted legislation to share the benefits of mining with affected communities, and recently adopted a new Rehabilitation and Resettlement (R&R) policy that is justly commended for being one of the most ambitious and advanced in the country. The chapters that follow articulate possible approaches and steps to further and enhance GoO's strategy towards sustainable mineral-intensive growth.

3. MANAGING THE ENVIRONMENTAL AND SOCIAL IMPACTS IN THE MINERAL SECTOR

I. THE CHALLENGE

3.1 Orissa stands sixth in overall production of minerals in the country and the mineral sector is growing rapidly. In 1999-2000 mining exports from Orissa -- minerals and metallurgical products – were Rs.17.04 billion, accounting for 80% of the exports originated in Orissa with aluminum and chromite being the most important items of export. In 2004-2005, mining revenues paid to the State amounted to Rs. 6.7 billion according to the Directorate of Mines, a nearly 90% increase form 2000-2001, representing about 6% of total revenue by the State and 12% of State's own revenue.

3.2 With its vast geological potential it is not surprising that there is global investor interest in Orissa's mining potential. Private investors in the mineral sector based industry have signed Memorandum of Understandings for 43 projects with potential investments of US$ 31.89 billion. In the year 2003 alone, 10 new mining leases and 22 prospecting licenses were granted covering 742.9 ha and 811.5 ha respectively. This is in addition to seven quarry leases for decorative stones covering 23.6 ha.

3.3 Mining is increasingly a global industry competing for the limited amounts of international exploration and development capital which seek the best risk adjusted returns. Over the last two to three decades many developing countries have successfully reformed their mining sectors and attracted significant private investment flows, technology and modern management to develop their natural resources. In Latin America Chile, Peru, Mexico and Argentina have implemented the most comprehensive reforms and produced impressive results. While some established Asian mining countries like Indonesia and Thailand have become less attractive to mining investors, other countries such as Papua New Guinea, Mongolia and China have enacted reforms and are enjoying considerable investment interest.

3.4 While mining creates opportunities for development, it is not without challenges and inherent risk that need to be addressed. Improved governance is the key to harnessing the benefits of mining sector. Table 3.1 provides a summary of the broad opportunities and challenges of developing a sustainable mining sector, and the necessary strategic response.

3.5 Successful mining laws typically help to (a) minimize corruption and rent seeking, as well as the duration of the permitting process by eliminating discretion in the implementation of the law; (b) reduce speculation and encourage active exploration by the use of properly structured license fees, which also serve to finance an independent and efficient mining *cadastre* (licensing register); and (c) provide environmental and social safeguards and rehabilitation with adequate risk mitigation and sound benefit sharing. Once a sound legal and regulatory framework is in place, achieving a positive impact of mining reforms on growth and poverty depends most on competent institutions to manage mineral wealth. While these broad guidelines are stipulated at the national policy level, the enforcement mechanism at the State level needs to be strengthened. Annex 1 provides the benchmarks of a good practice mining legal framework that successful mining countries have implemented.

Table 3.1: Opportunities and Challenges of Sustainable Mining and Strategic Response

Opportunities	Challenges	Strategic Response
Optimal use of the State's mineral endowment	Barriers to attracting large new investments by private and foreign investors.	Increase awareness of the needs for reforms among central and State government officials and other stakeholders
• Contribution to State GDP, industrial output, fiscal revenues, & exports earnings. • Employment and income multipliers, training, & skills transfer and human capital formation. • Opportunities for down stream processing and industrial development • Investment in local and rural infrastructure (physical and social) • SME development & supply chain linkages	• Inadequate and outdated legal and regulatory framework and limited institutional capacity. • Uneven playing field with SOE's and reserved minerals like coal • Inadequate minerals inventory, geological data base • Need for improved transparency and governance • High cost environment with few incentives to process marginal ores • Inefficient investment promotion • Lack of informed consultation with affected communities	• Review legal, regulatory and institutional framework • Improve institutional capacity, sectoral governance and revenue management • Develop a modern mining cadastre & registry • Ensure linkages to local economic development • Produce and disseminate basic geological information as a public good to stimulate private sector investment interest • Reduce import duties and maintain nominal royalty rates to encourage treatment of marginal ores • Eliminate tax holidays

3.6 For the mineral sector to contribute to growth and development there is a need, as the previous chapter advocates, to ensure that investors address externalities and that there are institutions and policies in place that create the appropriate incentives to attract ***responsible investors*** who recognize their rights and responsibilities. Responsible investors would be expected to integrate environmental and community concerns into their business decisions and adopt voluntarily corporate social and environmental responsibilities. This chapter focuses on (i) proper environmental management and rehabilitation; and (ii) peripheral/community development, as an integral part of the policy and regulatory framework that the GoO is developing for attracting responsible investors. These are essential to mitigate adverse impacts and ensure sustainable growth.

II. ADOPTING GOOD ENVIRONMENTAL AND SOCIAL PRACTICES

3.7 As the evidence from Keonjar confirms, most of the risks of mining activities occur at the local level and relate to environmental impacts, social and cultural impacts and increased population pressures due to in-migration to mining project areas leading to demands for increased services and infrastructure from provincial and local levels of government. Some costs are internalized by the mining company, but many are not, and these issues must be addressed by mining policy in order to maintain social justice, and through it, project security. Table 3.2 provides a summary of the broad risks and challenges of developing a sustainable mining sector, and the necessary strategic response which is largely in the hands of State government.

Table 3.2: Risks and Challenges of Developing Sustainable Mining and Strategic Responses

Risks	Challenges	Strategic Response
• Displacement and loss of livelihoods resulting in growing regional poverty • Environmental Risks (water, air, soil) • Natural resource degradation – deforestation, soil erosion loss of agricultural productivity, loss of water sheds • Social & Health Risks; Safety and work-related risks • Risk of expansion of informal small scale mining • Institutional erosion: risks of corruption at the lease granting stage, during operation (noncompliance with regulations) and misallocation of mining revenues • High cost to public sector of maintaining infrastructure	• Lack of informed consultation with affected communities • Lack of clear sectoral environmental and social management and mitigation systems • Lack of adequate requirements for social, health and safety and environmental protection and potential conflict with large scale mining • Lack of accountability and incentives to enforce regulations and safeguards	• Adopt credible consultation framework and implement a community development plan (GoO) • Establish sectoral environmental and social guidelines (GoO) • Introduce modern mining techniques, including Environmental Management Systems (GoO) • Formalize small scale mining and provide services to help the small scale miners to achieve sustainability (GoI, GoO) • Build capacity both at central and local levels for environmental and social management (GoI, GoO) • Increase accountability of environmental agencies to stakeholders(GoO) • Clear and non-discriminatory tax treatment of mining sector, taking account of the costs of addressing the negative externalities created by mining (GoI, GoO)

GoI – Government of India; GoO – Government of Orissa

3.8 Mitigation of the environmental impacts of mining and the progressive rehabilitation of the affected surface area is fundamental to modern sustainable mining development and retention of the "social license to operate" implicitly conveyed by the communities most impacted by the mining operation. Enforcement of Environmental Impact Assessments and agreed Environmental Management Plans are an essential part of this social compact, and will be especially important in Orissa with its high population density and intense competition for rural agricultural land.

3.9 Reputable mining companies recognize this and now take their environmental stewardship seriously by adopting and committing to good environmental practices. This is reinforced by balanced environmental legislation, adequately funded mine closure plans, and major international commercial financial institutions some of whom condition their loans to adhere to the International Finance Corporation (IFC) environmental guidelines/performance standards. It is important to note that, at least for the larger State and private mining companies operating in Orissa, adopting a good corporate citizenship behavior is becoming more common. Some examples of good practices in Orissa are provided in Box 3.1 below.

Box 3.1: Good Practice in Orissa

There are evidences that some mining companies are establishing trusts for local development on a voluntary basis. Orissa Mining Corporation (OMC) undertakes informal discussions with local communities when issues of concern emerge and the company takes actions in response which can include contributions for hospitals, schools, etc. In 2003, OMC opened four mines in tribal areas in which local people participated actively. In its Panchpatmaly mine, NALCO is committed to keep good environmental standards. It has also provided training and jobs for one person in each family of the Panchpatmaly village, built new houses and modern facilities for a tribal community of hunters and gatherers whose quality of life is likely to have improved significantly. Another example is that of Tata Steel which has forged partnerships with local communities at a regional scale. For example, in its Sukinda Chromite mine, socio economic development has been promoted in three districts and 42 villages through an autonomous body called the Tata Steel Rural Development Society which provides a mobile clinic, distributes free medicines, and contributes to agriculture extension, forestry programs, and cultural activities.

3.10 However, voluntary approaches are now becoming less effective in Orissa with the arrival of a large number of smaller players who are less affected by risks to their reputation and also have limited capacity to address the external costs of their activities. As the industry expands, these challenges will grow and there will be a need for greater emphasis on enforcement and compliance with environmental legislation.

3.11 Orissa has a significant share of minerals such as iron ore, coal, bauxite, chromites, limestone, graphite and lead, which generate large quantities of waste/overburden and tailings slimes. The OPCB is responsible for monitoring the onsite and offsite impacts of mining activities and compliance verification with the standards prescribed by the Ministry of Environment and Forests. The onsite monitoring covers liquid effluent and ambient air quality. The offsite impact is monitored through area monitoring programs, such as National and State Ambient Air Quality Monitoring Program, and National and State Water Monitoring Programs. Box 3.2 summarizes some of the key environmental safeguards in use. There are variations in the data coverage of the compliance levels and the compliance rates across monitored parameters, ambient quality monitoring units and times, which provide useful information for further focusing and strengthening the monitoring and enforcement effort. Issues related to environmental monitoring and enforcement in Orissa are discussed in more detail in Chapter 4.

Box 3.2: Key Environmental Emission and Discharge Standards in Mining

The following tables indicate the standards imposed in Orissa to address environmental issues that arise with mining. While the disposal of tailings generated during beneficiation of ore, remains a key concern for environmental management. The India Bureau of Mines (IBM) prescribes various options. According to the OPCB, all the mines which have ore beneficiation process have tailing ponds in Orissa. There is no comprehensive data on conditions and performance of these ponds.

Parameters*	Time weighted	Industrial	Residential	Sensitive	Coal Mines of Orissa**
SO2	Annual	80	60	15	80
	24 hours	120	80	30	120
NOx	Annual	80	60	15	80
	24 hours	120	80	30	120
SPM	Annual	360	140	70	430
	24 hours	500	200	100	600
RSPM	Annual	120	60	50	215
	24 hours	150	100	75	300
Noise	dB (A) day	75	55	50	75***
	Night	70	45	40	70

APPLICABLE EFFLUENT DISCHARGE STANDARDS FOR MINES

Parameters	Inland surface water	Public sewer	Direct Irrigation	Marine	Coal Mines of Orissa
pH	5.5-9.0	5.5-9.0	5.5-9.0	5.5-9.0	5.5-9.0
BOD	30	350	100	100	No
COD	250	no	no	250	250
TSS	100	600	200	100	100 (200 if used for irrigation)
Oil & Grease	10	20	10	20	10

* The general emission and discharge standards are applied for non-coal mines in Orissa

**Mine premises are considered as an industrial area, therefore the standards applicable for industrial area are enforced.

*** The definition of day for other than coal mines is from 6 am to 9 pm, while for coal mine is 6 am to 10 pm

3.12 Mine closure has become statutory since 2003 only. This is being implemented by the Indian Bureau of Mines (IBM). Early planning for mine closure is very important because it provides the pathway to addressing issues of long term community sustainability. *Mine closures process* represents a continuous series of activities that begins with pre-planning prior to the project's design and construction and ends with the achievement of long-term site stability and the establishment of a self-sustaining ecosystem.

3.13 "Beginning with the end in mind" conveys to the local communities that mining is a temporary use of land, lands will be reclaimed and put to other uses, and that sustainability comes from leaving lasting human capital and infrastructure after mine closure. Human capital is best fostered through education, either job training directly for the mine or the many innovative enterprises that may be needed locally to support the operation. Beginning with the end in mind also means that shared infrastructure can be designed and operated in a way that it can revert to other uses after mine closure. In agriculture-based economies, this may include roads and bridges that connect to larger markets, clean water systems, and the technology/capacity to monitor spatial and temporal changes of other natural resources.

3.14 From the perspective of governments, mine closure presents a complex mixture of environmental, social, economic and development issues. The government must ensure (a) industry has adequately recognized and prepared for over the life of the mining enterprise; and (b) that the closure plan is carried out to the satisfaction of the communities involved as also other major stakeholders and government at all levels.

3.15 The accommodation of all of these concerns, to the extent possible, results in what is called "comprehensive mine closure". Mine closure should be now considered in a broader context of the issues of "social/economic equality" and "sustainable development". This will result in greatly expanding the scope of government responsibilities and needed actions.

3.16 Mine closure planning has strong linkages to environmental concerns and the development of community management plans. Key components relate to the following:

- Economic incentive programs for companies to make investments in local small businesses or shared infrastructure. Historically, such contributions have been constrained by a lack of tax relief or other fiscal provisions that would offset cost to the project.
- The use of revenue sharing between government and communities to provide funds for community-based programs (defined in the community management plan). This leads to issues of shared company /community structures for trusts, foundations, and other community-based financial institutions.
- Government commitment to education to provide local skill sets appropriate for other industrial activities.
- HIV/AIDS education and prevention programs.

3.17 Planning for closure can generate benefits at two levels: *first*, at the level of the local community or region; and *second*, at the level of the mining company. Closure of mines, in the absence of any systematic planned closure process, will inevitably have serious consequences for local communities because of their dependence on a livelihood provided by the mining activity. A forward looking approach can simultaneously involve developing viable economic alternatives, transforming mined land for productive purposes such as for growing cash crops, and possibly timing new mining projects in the region. In the case of Orissa, most of the abandoned mines have naturally been converted into rainwater storage tanks, but the water is often contaminated which reduces its usefulness even in times of drought and pollution problems occur through acid rock drainage.

3.18 Indian law requires that a closure plan should be prepared "at the fresh grant or renewal of the license" (under MCDR - Mineral Conservation and Development Rules, 1988), with a financial surety, defined as Rs. 15,000 per hectare for small mines and Rs.20,000 per hectare for major mineral mine and which can be submitted in different forms – letter of credit, performance or surety bonds, trust funds or any other guarantees acceptable to the authorities. The closure plan is updated every 5 years and the final one is sent for approval a year before actual closure. According to the guidelines (Circulars no. 14 and 19/2003) the closure plan should address (i) the environmental issues and proposed remediation measures, as well as (ii) social issues, mainly related to employees laid off and socio-economic repercussions and the proposed remedial measures.

3.19 International experience suggests that the closure process in India, applicable to Orissa, can be improved in four main areas. The first is a consultation process with affected communities that should take place prior to closure to enable the communities to have their requirements addressed; for example, to decide on the land-use after closure (remediation measures will depend on that). Remedial measures for social issues and land-use planning should become part of the community management plan. Second, post

closure monitoring requirements are necessary, with the financial surety extending to the post closure period.

3.20 The third area relates to providing better clarity on how the funds accrued from collecting the financial surety are managed, by what institution and the responsibilities of that institution. The international practice is that the financial surety is created as a financial instrument at the disposal of the competent authority designated to control and monitor the implementation of closure and post closure works (most of the time the Ministry/Department of Mines or a specially created authority that will eventually contract the execution of closure/post closure works using funds from financial surety, in case the mining company can not do that).

3.21 Fourth and the final area where the closure process can improve is related to the need for complementing the new requirement by the respective capacity building of the relevant authorities to implement the legislation - both in terms of technical and financial capacity, mainly at the level of field personnel. Due to lack of capacity, the statutory authorities are often not in a position to compel the mine management to apply for renewal of extension even when the action of the management is against the interest of conservation of mineral resources.

3.22 At the level of regulations, there is a need to develop specific environmental and social guidelines for closure. In some countries, to address this need a Mine Closure Manual is prepared and includes specific mine closure environmental remediation measures and post closure monitoring actions. It also addresses how the communities should be involved in the closure process and the responsibilities of each main stakeholder in this process. While the necessary changes to the existing policy will require intervention at the GoI level, the development of implementation mechanisms to ensure proper environmental rehabilitation of the closed sites and monitoring on post closure period is largely in the State's hands, as experiences in other countries with similar conditions show.

3.23 ***Sustainable communities*** are the product of good policies and laws that have been planned and implemented at the local level by competent institutions/organizations, with the active participation of community members. Resistance to mineral investments is likely to develop if communities perceive threats to livelihoods or exclusion from the development process. Overarching instruments to ensure that local communities benefit from the extractive industries include:

- *a community consultation framework* to assess and assign the roles and responsibilities of government(s), the company(s), NGOs and donors, and local affected communities on measures to address environmental and social impacts; and
- *a community development plan* facilitated and coordinated by the government both at central and local level, in consultation with stakeholders, including the active participation of communities, to integrate mining and mine closure planning with broader regional economic development plans. The ultimate goal should be to transform the community into a reliable partner from just being a beneficiary.

3.24 One of the key, most immediate and visible social impact is caused by the need to displace some communities to enable mining operations. Past experience on resettlement and rehabilitation in Orissa suggests that often common property and its dependency for livelihood were ignored. To address this, GoO has recently introduced a new *Resettlement and Rehabilitation (R&R) policy* (adopted May 14, 2006) that proposes three different rehabilitation packages: preferential employment to at least one member of every displaced household[1]; vocational training to at least one member of every displaced

[1] A displaced family is defined as a family having continuously resided in the project area for at least 3 years prior to the project notification. An affected family is deemed to be one that loses more than 75 percent of its annual income. Hence a displaced family can be an affected family, but not all affected families will be displaced families. A displaced family is defined as a

household; and cash assistance when neither of these options is feasible. This is currently the most progressive and people-friendly policy among India States.

3.25 Orissa's new R&R policy is a major and most commendable milestone. To achieve the intended impact, it needs to be promptly followed by effective implementation. With overstretched institutions, there is a concern that policy promises may not be matched by policy implementation. There are also some legal ambiguities about the enforceability of the R&R policies which detracts from policy credibility. There is thus a need to clarify the legal status and enforceability of the R&R policy. Past experience of frequent delays in payments or cases of non-payment further plays an important role in shaping expectations and requires swift action. Another damaging perception is that even when compensation is paid, it is inadequate. In the absence of statistical evidence it is difficult to substantiate these claims. But this highlights the need for policies geared towards *restoring earning potential* (i.e. human capital), rather than simply compensating for lost assets. Most tribal oustees own few productive assets other than their human capital (usually skills that have limited alternative use), so higher reparation for physical assets does not adequately compensate for the economic impacts of relocation. The form of compensation – which is typically cash and one time payment, compounds these problems. The payment of cash to vulnerable groups with limited access to banking facilities is equivalent to liquidating assets and promotes current consumption over productive saving.

3.26 More importantly — and this is recognized by GoO — the R&R policy is the principal tool for addressing negative social impacts, but it is not the only tool needed for preventing nearby communities from being adversely affected by mining activities. As the pilot assessment conducted by this study (see Chapter 2) showed, livelihood opportunities for communities close to mines can be reduced, in part, due to a string of downstream effects such as lesser livelihood value of forests, contamination of water sources, etc. In this respect, one needs to acknowledge the efforts by the GoO, (accompanying the development of the R&R policy) to share the benefits of mining through a variety of local development schemes and by issuing the legislation to promote and support peripheral development in mine affected areas. The following section summarizes international experience in this respect that can inform further GoO initiatives.

III SUPPORTING PERIPHERAL COMMUNITY DEVELOPMENT THROUGH BENEFIT SHARING

3.27 A comprehensive framework for compensation and benefit sharing that leads to a concerted community development plan between the local community, the government and the mining company is the critical factor in managing mining revenues for local community development. Compensation will not be effective if the issue of facilitating the community's transition to a sustainable new way of life is not addressed. Benefit sharing approaches could be an important tool in transforming a community from just a dependent beneficiary into a strong reliable partner, prepared to manage its own development.

3.28 There is a broad range of benefits that can be provided to local and tribal communities affected by mining. These include provision of rural infrastructure, SME development, formation of human capital through company-sponsored training, providing job skills both directly at the mine, and in secondary support ("spin off") industries. Local and tribal people universally live in remote regions where mining has a large impact on its surrounding environment. In many ways, tribal communities are not that different from other communities located in remote regions, characterized by a dependency on natural resource industries in which economic benefits often accrue downstream. Most often, the natural resource in current use is the forest and its surface waters, where potential conflicts may arise and need to be resolved with the proposed mining activities.

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family having continuously resided in the project area for at least 3 years priori to the project notification. An affected family is deemed to be one that loses more than 75 percent of its annual income. Hence a displaced family can be an affected family, but not all affected families will be displaced families.

3.29 A comprehensive community benefits package, in principle, should include:

- ***employment and income-related benefits*** - which would include employment and income related opportunities that would be provided to the affected communities during both construction and operating phases including direct employment by the mine and also indirect employment such as local sourcing of certain supplies and services, spin-off businesses and small and medium enterprise development;
- ***benefits aimed at building local human capital and institutional capacity*** - which would include provision of training for community members (both for direct and indirect employment possibilities), training for community leaders and capacity building for community institutions and provision of micro credits to support existing and new businesses (not only those that supply the mine but also other sectors such as agriculture).
- ***benefits for the community resulting from the development of infrastructure*** - which would facilitate access to: (i) education (schools); (ii) access to markets for local communities to sell their products (roads); (iii) health (medical facilities); (iv) clean water, etc. that, ideally, should be supported by the investor and the government and managed by the community. Benefit sharing will be effective if the accumulation of human and social capital is promoted by improving the education and health standards of the local population and their collective ability to organize themselves, define their priorities, and represent and negotiate effectively their interests with third parties such as the government.
- ***trust funds***, efficient mechanisms to sustain human and social capital accumulation, either (a) set up for financing local development initiatives and which should be managed by the community according to its needs; or (b) set up for providing funds for future generations.

3.30 The challenge is to find ways to operate these principles in the specific social and cultural context. The approaches used in countries vary considerably reflecting their individual histories, economy and institutions. Typically the provision of benefits is funded by royalties. Most mining companies probably prefer that some portion of royalties, if payable, be targeted to affected communities. Because mining companies are increasingly concerned about maintaining a "social license to operate" and invest in affected communities, a royalty provides a relatively easy mechanism to channel funds. Direct investments in a community — for example, in roads, schools, medical support, and training programs — is not deductible for income tax purposes in many countries. Royalties are tax deductible in almost all nations.

3.31 The impact of mineral development on communities is hard to establish without appropriate legislation and an effective government administration. A mining company would prefer paying taxes to an efficient government administration that is able to deliver social services at all levels. However, this is rarely the case for developing countries, where the situation requires that the mining industry commit additional funds for social uplift in the areas that they operate. Reasons differ from country to country and range from government regulation to voluntary contributions to community projects. This leaves the mining industry and its shareholders in uncertain territory and divorced from core business activities. Expectations of improved services escalate when mining companies move into new areas, resulting in the allocation of additional company resources to fulfill government functions. The return on this social commitment is measurable through the degree of political stability it affords. In other words, the company

is awarded a social license to operate. Table 3.3 shows examples of how mineral law can accommodate social contributions.

Table 3.3: Relationship between Social Commitment and Mineral Royalties

Description	Canada North-West Territories	Ghana	Namibia	Papua New Guinea	Philippines	Peru	South Africa	Tanzania
State willing to share royalties (set in law)	Yes	Yes	Yes	Yes	No[a]	No	Yes	Yes
Mineral royalties: Directly to community	Yes	No	No	Yes	Yes[b]	No	Yes[c]	No
Payable to State	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Provision for sharing	Yes	Yes	No	Yes	Yes	Yes	No	No

(a) A higher royalty rate is applicable. (b) Through trust funds, 1 percent minimum contribution. (c) Through the community holding a preferential right.

Source: J. Otto et al (2006)

3.32 The forms in which benefits are transferred to local communities also vary considerably across countries. Often these schemes rely on local governments to provide services that compensate for the impacts of mining. However, experience suggests that in many cases the outcomes have been disappointing. For instance, several programs contain employment guarantees, but remote communities seldom provide skills suitable for mine employment; so implementation of these commitments is difficult and raises costs for mining companies. In other cases, royalties paid to the central government do not revert back to the affected region even when the legislation specifies that this should be the case. Finally, many of these schemes rely on local governments to deliver services, but neglect the fact that they may lack the capacity to discharge these additional functions.

3.33 The essential problem with many of these initiatives is that the commitments are not realistic and cannot be implemented and so erode trust and credibility in the system. There are three key priorities that need to be addressed in designing a benefit sharing program. First, the system must be sufficiently adaptable to accommodate the potentially diverse interests and be accountable to local communities. Second it is important to deliver benefits in ways that are meaningful to communities and generate economic development that can be sustained beyond the (finite) life of a mine. Third, the system must be credible and establish trust. If impoverishment is the anticipated consequence of mining, then resistance can be expected to follow.

3.34 One promising approach to this problem is the Development Forum introduced by Papua New Guinea (see Box 3.3). It is a participatory model involving government, company, and local community representatives. Till date, the Development Forum has functioned well and has been instrumental in achieving a higher level of participation by local communities. It has also secured a greater level of community support for mine development. While one country model can not be directly transferred to another, the key principles of the Development Forum appear of broader value and potential interest for Orissa.

Box 3.3: Development Forum Model: Experience of Papua New Guinea

The forum has two principal functions. The first is as a venue for the sharing of information on the project from the developer and the State with the landowners on the nature, scope and impacts of the project. The second is to establish how the benefits derived from the project will be shared by the various stakeholders, which are then recorded in a series of project agreements or Memorandums of Agreement (MoAs). These agreements establish the role and responsibilities of all involved parties (government, mining company and community) and include services and benefits that will be provided in the project's affected area. These include the provision of community infrastructure and the sharing of project's financial benefits. In return for the benefits, the landowners commit themselves not to disrupt the project development and to work together with the government and the developer. It also commits the parties to an ongoing consultation process where development related issues could be discussed and resolved as they arise. This initial consultative process and the establishment of the various agreements take place prior to the Development/Concession Contract be signed between the Government and the mining company.

There are a number of key advantages to such a participatory approach that emphasizes partnerships and mutual obligations. First, it provides a flexible template that can accommodate diverse issues and needs of different communities. Second, the approach remains highly inclusive, with all relevant stakeholders being part of the management and making informed decisions, based on communication, consultation and negotiation. Third, the approach is fundamentally participatory and democratic. Affected people have an active role in decision making. This is in stark contrast to the prescriptive policy approach in India where the form and level of compensation is predetermined by the government. Finally, the Development Forum in PNG has firm legal underpinnings and is enforceable contracts. Consequently they are credible and legally binding commitments that create trust and confidence which are needed to rebuild communities and enhance economic activity.

Source: World Bank – PNG: Mining Sector Technical Assistance Project

3.35 **The *manner in which benefits are shared* is another important dimension.** In developed countries with efficient service delivery mechanisms, the benefits from resource rents are typically in the form of public goods that are delivered by existing institutions. In some cases revenues may be allocated to particular regions to address negative externalities, or to promote certain priorities such as health or education. Beyond such limited earmarking there is little reason to develop parallel structures to deliver benefits.

3.36 However, where institutions are weak, earmarking revenues to specific policy priorities may be an ineffective way of responding to needs. Where service delivery capacity is weak, resource benefits are often distributed directly in cash and this is done in public to minimize the risks of embezzlement. Cash transfers ensure direct benefits for citizens and limit the ability to divert funds to undesired ends.[2]

3.37 Cash transfers can make immediate improvements in lives of the poor but they are not sustainable on the long-term. There are also important caveats. Where banking and investment opportunities are limited, transfers are much more likely to be spent than saved or invested, making them even less likely to spur additional economic development. In both Papua New Guinea and the indigenous communities in Australia the sudden injection of cash has often been socially disruptive, leading to over-dependence on cash transfers with no visible development benefits for the community. The additional income may also substitute for labor supply. These results are especially problematic when cash transfers are tied to the life of the mine; afterwards, income drops off without other productive assets being available to pick up the slack. The decline of phosphate mining on the island nation of Nauru has left the inhabitants impoverished.

[2] In a widely cited paper Sala-i-Martin and Subramanian (2003) argue strongly for distributing all of Nigeria's oil and gas revenue to adult citizens. The goal of this recommendation is to eliminate the corrupting influence resource wealth exerts on Nigerian institutions. It is estimated that this would turn Nigeria from a poor to a middle income country with each household receiving a transfer amounting to 43% of per-capita PPP GDP – resolving many of the country's development problems.

3.38 Determining ***how much to share*** will involve balancing community needs with available public funds and corporate profits. An approach based on voluntary negotiation, with the government playing the role of referee between the company and the community, may provide a natural solution. With voluntary negotiations firms would never (knowingly) agree to a package that would make their investments uncompetitive, and affected communities would not agree to one that (knowingly) left them worse off. Hence, a voluntary settlement would be reached only if the agreement is ***mutually beneficial***. This approach, however, would be complicated in the situation of many players and companies, typical in many areas of Orissa. Furthermore, considerations such as overall fiscal regime for mining, revenue sharing arrangements between Central, State and local government, and the effectiveness of public service delivery mechanisms will all play a role in arriving at an appropriate solution in a particular context.

IV THE WAY FORWARD

a. Improving the Quality of Investment and Addressing the Impacts of Mining

3.39 Few economies can absorb the magnitude of change in the mining sector being envisaged for Orissa, without some undesirable consequences that need to be minimized and mitigated. The establishment of an integrated system of risk management is a prerequisite to unlocking mineral-intensive growth in a socially and environmentally sustainable manner.

3.40 To ensure environmental protection and social mitigation, further reforms are required to improve the permitting process and strengthen the institutional and administrative capacity of the public mining institutions. Specifically, the following actions are needed:

- Support enhancement of security of tenure and property rights by reducing ministerial discretion in the allocation, transfer and termination of mining rights with a greater focus on attracting responsible investors that accept their social and environmental responsibilities;
- Improve access to minerals by streamlining the permitting process, avoiding administrative duplication, and establishing a modern computerized mining cadastre and registry system, centralized in Bhubaneswar with three or four online regional bureaus located at the district offices of the more prospective areas;
- Develop guidelines for mine closure, an environmental/social impact assessments, environmental/social management plans, to facilitate rational land use planning, community development and benefit sharing for local and tribal peoples, and the dual use of designated forest areas with progressive rehabilitation and forestation; and
- Consult and work with the affected community to develop and implement the community development plans, involving also the other stakeholders – the mining company and NGOs.

b. Benefit Sharing

3.41 ***A flexible benefit sharing instrument is needed that can be tailored to local needs and accommodate diverse industry structures and management capabilities.*** The mining areas of the State vary across a number of dimensions including: the type of mining activity, the number of mines, the size of mines, topography, density of population and the assimilative capacity of the environment. This rules out a *one-size-fits all* approach. Each case will involve a different set of actors and fine tuning the mechanism to meet community needs will require a system that elicits information and allows choice. Negotiation and participatory approach are therefore preferable to prescriptive "top-down" approaches.

3.42 ***It is vital to strengthen the relationship between mining activities and tribal and local communities, through a sustained dialogue between the state, the tribal and local communities and the mining companies.*** The establishment of an integrated system of risk mitigation and compensation and benefits sharing for local and tribal communities can be the key to unlock geologically important areas where mining is currently not accepted. This integrated system would be also the mechanism required for mining to promote sustainable growth at the local area. As said before, the Orissa's mining industry has been proactive towards the development needs and aspirations of the tribal and local communities. This is a valuable social capital asset in which to build on a more efficient system for delivering local development out of mining activities.

3.43 A ***participatory partnership model*** such as the PNG Development Forum provides a template that can be adapted to different circumstances and harness the comparative advantage of different groups. In areas with multiple small mines, capacity constraints might limit the ability of small companies to engage in any meaningful benefit sharing. It may be necessary to pool resources to address problems that need collective action. In this case local governments should play a more active role in service delivery and this will call for simultaneous efforts to improve local government capacity and accountability. On the other hand, where a single large mine dominates the landscape and local government capacity is over-stretched, the company would likely take responsibility for providing benefits in the form chosen by communities. However, this approach does not ensure sustainability in the long term. Mining is a temporary activity and if the necessary conditions for sustainable development are not created after closure, the affected community would end up in a worse situation.

3.44 ***Adequate forms of benefits must be made available.*** There are clear advantages to providing benefits through public goods that leave durable development outcomes and promote economic independence. The payment of cash is most likely to induce immediate consumption instead of investment and additional income will tend to substitute for labor supply. However, cash payments are usually one time payments and should be the last resort in areas that lack service delivery capacity, or where trust of local institutions remains weak.

3.45 The following Table 3.4 summarizes the options and trade offs that would need to be considered in developing a benefit sharing mechanism.

Table 3.4: Benefit Sharing Schemes

	Advantages	Risks
Structure		
Partnership Participatory Approach such as Development Forum	• Consultative, inclusive, accountable, flexible • Reach mutually beneficial agreement • Emphasis is on mobilizing trust and partnership, rather than the coercive force of law	• Developer or government may be unwilling to participate • With large and diverse numbers of firms and affected people assuring fair and adequate representation will be difficult
Forms of benefits sharing		
Employment and income related benefits	• Community preferred benefit • People feel more safe if they get a job • Small businesses created bringing more job opportunities	• Mining highly intensive, limited direct jobs available; • Affected communities lack necessary skills either to work for the mining company or to set up other businesses
Cash	• Less vulnerable to capture • Easy to target • Easy to deliver cash benefits when institutions are weak	• Create cash dependency, promote consumption not development or saving • Not effective in large populations
Public Goods	• Promote development • Build lasting human capital. • Create sustainable regional economy after mine closes	• Difficult to provide public goods if weak institutions • Wastage if services not desired by communities
Training	• for community members (both for direct and indirect employment possibilities), • for community leaders • capacity building for community institutions • provision of micro credits to support existing and new businesses (not only those that supply the mine but also other sectors such as agriculture)	• captured by community elite and not all community members have equal chances to attend training • not economically viable small businesses so that credits can not be returned (to create a revolving fund) • community institutions unwilling to participate
Trust Funds	• financing local development initiatives and which should be managed by the community according to its needs; • providing funds for future generations	• weak community institutions not able to participate actively in the decision process for trust funds management • trust funds captured by politicians/community elite/local governments and used for other purposes
Relevant Stakeholders Roles		
Companies	• Large corporations may have better capacity and experience in supplying infrastructure than remote and under-funded local governments • Fosters trust with mining sector • Builds a mining community that is loyal to the mineral sector or firm.	• Not core business of the mining company, raises business costs • Create mine dependency
State/Local Government	• Overcome collective action problems when there are a large number of mines • Builds capacity of local government and communities	• Lack skills and capacity, Vulnerable to capture by interest groups who divert benefits to other purposes.
Civil society	• Provide services to the affected community (training, awareness programs) • Trusted by communities • Able to mobilize funds	• Have their own agenda and can easily manipulate communities • Represent the interest of the sponsor and not so much the interest of the community
Community	• Knows better what it needs • Partner in the development agenda • Better monitoring of the implementation of development programs and their impacts	• Lack of consensus between different groups • Weak community organizations and easy to be corrupted • Captured by interested groups

3.46 If the right policy, including benefits sharing mechanisms and institutional framework are in place, mining can be a development driver of a mineral resources rich economy. As attested by the growth experience of developing countries in the last quarter of the twentieth century, the fastest growing economies of Latin America and Africa have been the mineral dependent economies of Chile and Botswana, respectively. Likewise, Orissa has the opportunity to tap into its mineral wealth to close the development gap with the most advanced Indian states. The following chapter discusses the principal elements of the institutional framework related to managing environmental risks of rapid industrial growth.

4. STRENGTHENING ENVIRONMENT INSTITUTIONS TO SUPPORT RAPID GROWTH

I. KEEPING PACE WITH THE INVESTMENT BOOM

4.1 As highlighted in Chapter 2, a sustainable growth strategy for Orissa has to give priority to managing and mitigating the environmental impacts associated with the booming investment in the mineral based sectors, unprecedented in scale anywhere in the country. In addition to mining, Orissa is also becoming a major manufacturing investment destination in India, particularly into mineral based industries, such as steel and sponge iron and aluminum plants.

4.2 A rapidly changing economic profile driven by high demand – domestic and international – in steel and other mineral-intensive products is also bringing noticeable environmental and social changes on the ground. This is leading to a two-way pressure on environmental institutions. On the one hand, a growing public awareness and demand for better environmental management, evident across the country, is escalated by the realization that much of the proposed investment in mineral based industries is highly polluting. On the other hand, rapid industrial growth results in an increasing workload for the environmental regulator to process a larger number of applications, monitor and enforce compliance by a larger number of facilities, and respond to a larger number of public complaints. This is compounded by pressures for higher performance with providing environmental clearance as in an efficient and expedient manner.

Table 4.1: Orissa's Economic Growth 1980s – 2000s (in %)

	Annual Growth Rate*		Contribution to Growth	
	1980-89	**1991-00**	**1980-89**	**1991-00**
Primary	2.8	2.0	41	20
Agriculture & Livestock	3.1	0.5	35	1
Fishing & Forestry	- 0.9	2.4	-	4
Mining & Quarrying	9.7	11.6	6	15
Industry	**7.1**	**3.7**	22	20
Services	7.5	6.6	37	60
Total GSDP	5.0	4.1	100	100

Notes: *Trend rates using a semi-log regression on GSDP data at 1993/94 prices
Source: Central Statistical Organization

4.3 An example of the performance challenges facing environmental and sector institutions can be seen from a ban by GoO on locating new sponge-iron industries in six sensitive blocks of the state, namely Kuarmunda, Lathi Kata, Rajgangpur and Bonaigarh in Sundergarh district; and Jharsuguda and Rengali blocks in Sambalpur district, that have featured growing levels of public complaints relating to increased air pollution. Yet, the state is anticipating a 30-fold increase in steel production and doubling of the production of alumina. These challenges are further exacerbated by the fact that nearly 80% of the industries are in the small scale category with little or no environmental management knowledge, capacity or experience. Among the small scale industrial units[3], 64% of the units fall into the highly polluting or red category of industries and another 7% are the moderately polluting or orange category of industries. As a result, the ability of state institutions to manage the environmental and social impacts of a resource led growth strategy will be increasingly tested among a wide range of stakeholders, including private investors and the general public. Meeting these performance challenges will require strengthening regulatory programs, implementation records, and public accountability.

[3] As per the records of OPCB, there are 2461 industries operating in Orissa, out of which 60% fall in red category, 11% in orange and 25% in green category. (2005)

II. MULTIPLE POLICIES AND INSTITUTIONS TO ACHIEVE COMMON GOAL

4.4 The current environmental policy framework in Orissa is derived from various environmental statutes, legislated at the Central level by the Ministry of Environment and Forests (MoEF). The state primarily relies on the Central government to set environmental policy and has no separate state environmental policy or strategy. Given the nature and quality of efforts for environmental protection in the industry and mining sectors, environmental management is also strongly influenced by policies and initiatives of a host of sector institutions, such as Department of Industries (DoI) and Department of Steel and Mines (see Table 4.2 below). The GoO has adopted an Industrial Policy - 2001 and is currently developing a State Vision for 2020. Under the policy, "The State Government intends to facilitate handling of environment and social issues involved in setting up of industrial and infrastructure projects." As many of the emerging investments are resource and pollution intensive, environment management a key consideration in the State's development policies. Furthermore, the challenge is to effectively integrate and ensure compliance of environmental considerations in the implementation of development policies and projects.

4.5 Among the various governmental institutions, the OPCB plays the major role in ensuring compliance with environmental laws and regulations, particularly in the industry and mining sectors. The purpose of this chapter is to focus on the primary responsibilities of the environmental agency, the OPCB. Considerable progress has been made in establishing the environmental regulatory framework in Orissa, but much remains to be done to further strengthen implementation of the regulations, procedures, mechanisms and practices in monitoring, compliance, and enforcement. In particular, the OPCB is undertaking or planning important initiatives to improve the consent management system, increase environmental compliance in the regulated community, promote effective public participation, and decentralize environmental functions to the regional offices.

Table 4.2: Key Regulatory Agencies for Environmental Management in Orissa

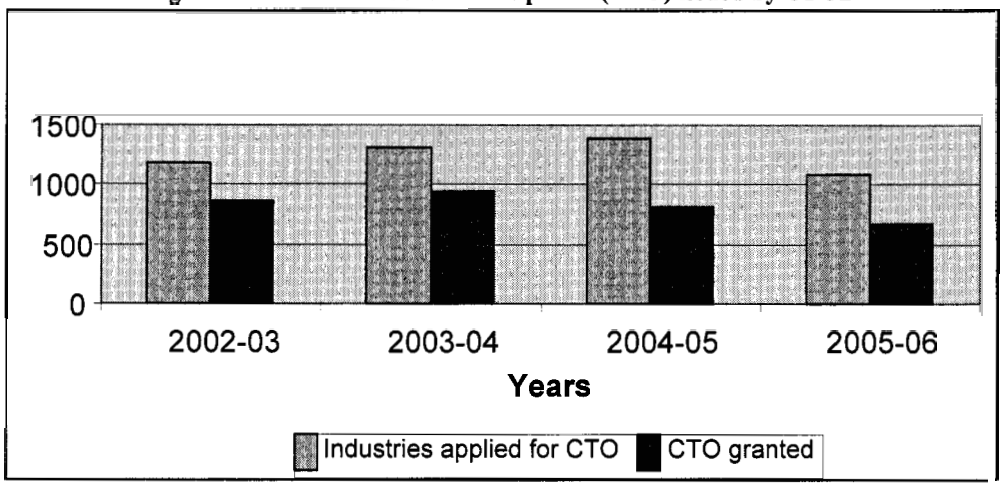
Departments/Organizations	Major Regulatory Role
Department of Forest and Environment	Responsible for conservation and sustainable management of forests and wildlife, afforestation and regeneration of degraded forest lands, control and abatement of pollution and administration of environmental laws, and promotion of environmental awareness among the public. The Environment Wing is responsible for State level environmental clearances for certain category of Industries under EIA notification 1994. The Forest Wing is responsible for forest clearance and administration under the Forest Conservation Act 1980 and Indian Forest Act 1927.
Orissa Pollution Control Board	Responsible for environmental management in the State, including ensuring the environmental compliance of industries and mines. The basic mandate of OPCB is derived from the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention & Control of Pollution) Act, 1981, and responsibilities have grown with the enactment of the EPA 1986 to include the monitoring, regulation and enforcement of almost every aspect related to industrial pollution.
Department of Steel and Mines	Responsible for regulation and development of the mineral sector in the State. The Directorate of Mines grants prospecting licenses and mining leases for specified minerals and minor minerals, including requiring the submission of environmental management plans.
Indian Bureau of Mines	Responsible for setting national policies and regulations for the mineral sector and specifically, approval of Mining Plan and Mining Closure Plan under the MMRD Act 1957, MCR 1960 and Mineral Conservation and Development Rules, 1988.
Department of Industries	Responsible for accelerating economic development in the State and facilitating investment in industries and infrastructure. The basic mandate is derived from Orissa Industrial Policy Resolution 2001 and Industries Facilitation Act 2004.

III. Responding to the Demands of Growth: Increasing the Effectiveness of the Consent Management System

Consent to Establish and Consent to Operate as a tool for Enforcement and Compliance

4.6 Activities, particularly industrial and mining activities, which would cause environmental pollutants to be released in the air, water, or soil require consent from the SPCB. This is the main instrument of environmental clearance at the state level, in addition to environmental assessment and forestry clearances provided by central government (see Box 4.1). The purpose of the consent management system is to ensure that these activities are conducted in a manner that complies with all environmental laws and regulations. A project proponent has to first obtain a Consent to Establish (CTE) for the proposed activity and then a Consent to Operate (CTO) for the facility, which is required to be renewed after a specified period of time. The responsibility to review and issue CTE and CTO for industrial and mining activities in the state is perhaps the single most important mandate of the OPCB and the one receiving the most attention. The CTO is also the primary instrument available to leverage greater compliance; so there is an urgent need to examine its effectiveness and explore complementary approaches to improve compliance while simultaneously reducing regulatory costs. The number of applications for CTOs has been rising steadily in the past few years (see Figure 4.1).

Figure 4.1: Trends in Consent to Operate (CTO) issued by OPCB



Source: Annual Report, Orissa State Pollution Control Board, 2006

Rationalizing Consent Management

4.7 The OPCB has been reforming its consent management system to be more efficient and effective in performing services and protecting the environment. In the past two years, several steps have been taken, including a move towards risk-based consent management. Specifically, OPCB is in the process of linking the duration of CTO to the track record of environmental compliance and performance. Industries with a good compliance history might be given CTO for 5 years, while violators will continue to be given CTO for one year (or even less in some cases). This has been complemented by the decision to delegate greater responsibility for consent management to regional offices that are now responsible for issuing "consent to establish" (CTE) and subsequent CTO (except for the first one) to green and some small scale orange and red industries. Public notice was issued providing clear guidelines to industries where to apply for pollution management consent in each case. To further support and increase the efficiency of consent management, computerization of the central and regional offices is on-going, and

software specialists have been hired to customize consent management software used by some other PCBs to OPCB needs.

4.8 These new promising initiatives are at the early stage of implementation, and the system remains under considerable stress which will likely increase with future growth projections. Significant, well-planned capacity building efforts – at the central and particularly regional office level – and long-term government commitment to strengthening these institutions are required to adequately support and safeguard the growth agenda.

Box 4.1: Mitigating Risks through the Environmental Assessment and Forestry Clearance

The existing regulatory framework for environmental protection in industrial and mining sector includes a role of central government through a system of appraisal by a committee of experts, which is responsible to clear projects based on assessment of environment and social risks. The requirement for environmental clearance for industrial and mining projects is not only confined to consents from the OPCB at the state level but also includes both forestry and environmental clearances from the Ministry of Environment and Forests at the central level. Most industrial and mining projects[4], which fall into 17 categories of industrial activities and mining activities notified by the MoEF, are required to undertake an environmental impact assessment pursuant to the Environmental Protection Act, 1986. As part of the environmental impact assessment system, the OPCB is required to conduct a public hearing and forward the environmental assessment, along with a summary of the public hearing, to the MoEF expert appraisal committee in Delhi for environmental appraisal and decision.

In addition, forestry clearances are required and processed separately by Department of Environment and Forests at both the state and central levels of government. In cases where forest land is impacted by the proposed activity, a separate application for forestry clearance must be submitted and evaluated by the State Forest Department based on assessment of losses by District Forest Officer supported by preparation of estimates for compensatory afforestation levied to the project. In addition to compensatory afforestation costs, the MoEF requires the project proponent to deposit net present value of forest with the Forest Department while granting forestry clearance to the projects.

Expanding the scope of consent management

4.9 Under the consent management system, only 172 mines are covered out of the approximately 300 legally operational mines in the State. While the DoI has a complete inventory of all industries in the state, not all small units are covered by the environment CTE/CTO system. For example, under the current regulatory scheme, mines with less than 5 hectares are not covered under the consent management system. This may result in smaller mines, which have considerable *cumulative* impact, operating without proper knowledge and adherence to environmental safeguards. Therefore, it would be useful to strengthen collaboration and coordination between OPCB, DoI, DoS&M and IBM, in reviewing the list of entrepreneurial activities registered with DoI, DIC, DoS&M, and IBM and cross-verifying with the OPCB compliance management database. Information collected by OPCB from this inventory should be computerized, stored, and accessed in a shared database which would list the type of business or operation, geographic location or area, applicable registration or licenses, and pollutants or emissions associated with production. The OPCB could also consider establishing an amnesty program that would invite unregulated industries and mines to obtain consent under simplified procedures and legalize their operation. After the amnesty period, OPCB should launch an aggressive inspection program randomly inspecting industries and mines.

[4] Most mineral based industry in Orissa and mining activities (with mining area more than 5 hectares) would need to go through the EIA process.

IV. ENHANCING ACCOUNTABILITY FOR ENVIRONMENTAL VIOLATIONS: IMPROVING MONITORING AND ENFORCEMENT

Strengthening Reporting, Inspection and Monitoring

4.10 A strong compliance monitoring and enforcement response is fundamental to ensuring compliance with the law and maintaining an agency's effectiveness. A regulatory agency relies on three primary methods to gather information regarding compliance with environmental laws: (i) reported public complaints; (ii) on-site inspection visits; and (iii) environmental reports submitted by facilities such as self-monitoring reports provided by the regulated factories. Although the OPCB has adopted procedures for the filing of public grievances, consultations with stakeholders revealed that there is limited public knowledge of these grievances procedures or of the functions and mandates of the Board. OPCB estimates that more than 30% of complaints relate to the matters outside the purview of the Board. This creates a perception of irresponsiveness by the Board among some stakeholders, which could be addressed by a program of better communicating and explaining to the public the responsibilities of the Board and the type of grievances it would effectively consider. There is also a scope for better coordination and collaboration between the OPCB, particularly its regional offices and local governments with respect to transmitting and addressing public complaints. At the same time, more can be done to ensure that legitimate complaints within the purview of the Board are addressed in a timely manner and that enforcement actions are publicly documented to provide a strong deterrent for willful and persistent violators.

4.11 Since much of the technical staff time is taken up with processing consent management applications less time can be devoted to monitoring and inspections. OPCB's inspection schedule is summarized in Table 4.3. OPCB staff had to undertake about 4000 inspections in 2004-05, and the number is set to increase with industrial and urban growth. With the reform of the consent management described above, hopefully more staff time can be re-allocated to inspections.

Box 4.2: SPCB Initiatives to Strengthen Compliance and Enforcement

The Andhra Pradesh Pollution Control Board (APPCB) established a Task Force cell to respond to citizen complaints and provide relief against polluting industries in certain hot spots and other areas in the State. The Task Force conducts surprise inspections, collects samples for water and air pollution to identify violating industries and take appropriate actions. As a result of the intensified monitoring by the Task Force, the APPCB has issued show cause notices, enforcement directives, and closure orders against polluting industries based on the severity of the pollution problem. (Source: APPCB website)

The Gujarat PCB has adopted a series of incentives to promote industries choosing to design and implement environmental management systems such as ISO 14001. These incentives include giving priority environmental approvals within a period of 45 days; extending the water consents from 5 years to 6 years; allowing units with ETP to be eligible for 25% fee rebate provided they do not exceed the water limits under their consent and meet the standards under the Water Act. In addition, the Gujarat PCB has promoted a series of industry-specific guidelines for certain sectors such as aluminum, cement, chlor-alkali, pulp and paper, etc. under the Charter of Corporate Responsibility (Source: GPCB website, http://gpcb.gov.in)

4.12 Importantly, there is recognition of the need for innovative approaches to monitoring of environmental compliance, particularly involving citizens and local governments. Five "watch-dog committees" involving an OPCB regional office representative, a district collector and a representative of the local community have been set up in the past two years, and appear to have had an impact according

to regional office staff. Other compliance and enforcement mechanisms, which have been adopted by some other SPCBs in India, could also be explored (see Box 4.2).

Table 4.3: Inspection and Monitoring Schedules followed by OPCB

Size of Industry	Pollution Category	Minimum Frequency
Small scale	Red	Once in a year
Small scale	Orange	Once in 3 years
Non-polluting small and tiny industries	Green	Once in 5 years on random basis
L&M	Red	Once in 3 months.
L&M	Orange	Once in a year
L&M	Green	Once in 2 years on random basis

4.13 Managing compliance and enforcement data also presents an on-going challenge for regulatory agencies. OPCB's current electronic database system is underdeveloped and of limited value since it includes only basic information regarding regulated facilities. Critical information, including consent management documents and EIA reports, until very recently was filed in the paper archives, but the agency is moving towards a paperless, computerized system. This opportunity should be used to strengthen information management by greatly expanding the database to ensure that all relevant information related to compliance and enforcement, monitoring data, consent management, EIA, as well as specific information on water quality, air quality, land use, and hazardous or toxic waste is available on the system. This is particularly important in light of the recently enacted Right to Information Act. Cross sectoral coordination could also be improved through the sharing of monitoring and inspection data of regulated facilities.

Creating credible enforcement deterrents

4.14 OPCB has an important role to play as the prosecuting agency for environmental violations, but it lacks the legal expertise and capacity to develop sound environmental cases for prosecution in the courts. While the PILs and judicial mandates have grown in Orissa, insignificant efforts have been made to build the legal capacity and training of the DoF&E and OPCB. Legal training is needed to address current deficiencies in the development of enforcement cases, such as collection of necessary evidence to convict polluters; negotiating favorable settlements; and dealing with complaints by polluters. Therefore, one of the measures that should be taken to improve compliance and enforcement is to strengthen legal expertise available to the Board.

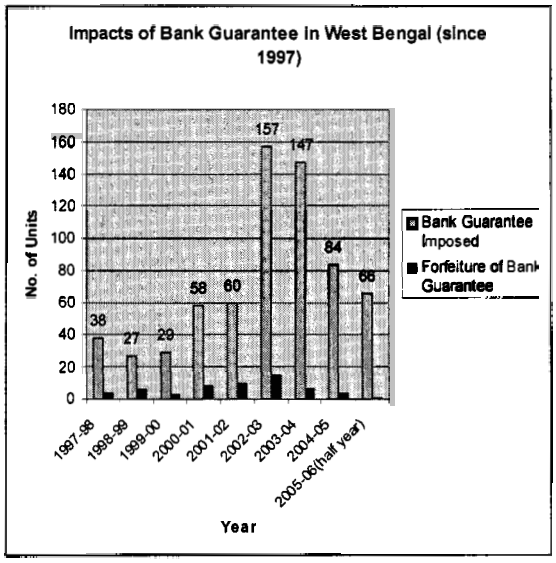
4.15 In order to strengthen the available enforcement and incentive mechanisms with DoF&E and OPCB, there is a need to complement the current legal system, with additional enforcement deterrents. Recognizing this lack of credible deterrents, OPCB has adopted a Bank Guarantee System, first introduced in West Bengal (see Box 4.3), conditioning the renewal of CTO for willful defaulters on a bank guarantee which is forfeited in case of non-compliance, as a tool to strengthen enforcement deterrents, along with other strategies such as cutting raw material supplies to non-compliant units. OPCB has used this tool more as a remedial measure to bring willfully and chronic defaulters under compliance. However, the use of this program could also be explored as a preventive tool to ensure compliance for red category and environmentally sensitive industries and mines.

Box 4.3: Role of Bank Guarantee to Improve Compliance in West Bengal

Most State Pollution Control Boards face a major challenge in enforcing environmental compliance with the stipulated environmental emission and discharge standards. Although the prevalent environmental standards stipulate requirements both for prevention and control of pollution, the enforcement has often failed to distinguish between a genuine defaulter and a willful defaulter. Several Pollution Control Boards are now attempting to encourage industries through partnership, commitments and voluntary initiatives, to move beyond compliance through adoption of clean technologies and improvement in management practices.

Even while voluntary initiatives have helped several critically polluting sectors develop a road map for progressive improvement in environmental management systems, there are still a number of cases (in most States) where some willful defaulters have failed to comply with the regulatory norms in spite of demonstrated techno-economic feasibility of pollution prevention and control as established by other players in the same sector. Many SPCBs have tried various means to bring such defaulting units under compliance using regulatory means such as legal closure notice; cutting water and electricity supply etc but with limited success as these have in-turn generated other socio-economic concerns such as loss of production and employment as well as protracted legal battle.

The West Bengal Pollution Control Board devised and adopted a unique method in 1997 to address such situation by asking for a Bank Guarantee from the concerned units indicating the commitment to the comply to an action in a time bound manner. The Bank Guarantee system does not replace the stringent requirements in the existing standards and action already taken/initiated for non-compliance and area-specific requirements. The experience of use of such a system has generated interesting results as most willful defaulters have taken appropriate steps to comply with the regulatory stipulations so as to not forfeit the Bank Guarantee money. The following table and graph demonstrates that economic instruments including penalties have strong potential to influence the environmental behavior of polluters, warranting its wider application. However, it is clear that this approach has limitations, as it would not be effective for SSIs lacking access to finance and credit. For SSIs, innovative regulatory programs combining targeted monitoring with *compliance assistance* are more suitable.



Regulatory Action by WBPCB in 2005-06	*Total Number*
Imposing BG	59
Forfeiture of BG	1
Issuance of Closure notice	230
Suspension of closure	144
Disconnection of electricity	222
Restoration of Electricity	146
Imposition of Pollution Fines	46

Providing Compliance Incentives

4.16 Compliance assistance is an essential component of any strong environmental management program. Assistance can be provided in a variety of forms, including economic and/or regulatory incentives to encourage good compliance, as well as voluntary performance obligations, and informational and/or technical assistance programs targeted to the regulated community. For example, the OPCB has stepped up with an important initiative (followed by some other SPCBs) to institute two awards, Pollution Control Excellence Award and Pollution Control Appreciation Award, to recognize and promote good environmental performance. While this is a commendable initiative, to have a wide-spread impact on polluter's behavior and compliance levels it needs to be complemented by other programs that provide targeted regulatory and/or economic incentives and technical assistance to different groups of polluters.

4.17 It is particularly difficult is to encourage compliance and good voluntary performance by SMEs and SSIs, such as, for example, stone crushers. These units are generally generating pollution at higher per unit of production than corresponding larger units, because of economies of scale, the use of obsolete technologies, lack of financial resources to upgrade, and poor understanding of environmental management practices. Importantly, the costs of compliance are relatively higher for smaller units. Thus, incentives need to be built into special regulatory programs for such units/sectors that should include a *package* of targeted monitoring and enforcement, extensive technical assistance and outreach, and some financial support. A successful program of cleaning a cluster of coal-using small industries in the center of Kolkata (see Box 4.4) is a good example of a cooperative regulatory approach targeted at SSIs. While coal- burning units are not an issue in Bhubaneswar (thanks to a foresight policy decision by the OPCB in early 1990s not to allow operation of any coal fired boilers in and around the state capital), the WB PCB program is of interest because of many elements of best practice that have broader relevance for others pollution control programs (and/or other towns in Orissa) targeting SSIs. These are: using scientific information to set a regulatory priority and creating a targeted regulatory program, complemented by outreach, and technical and financial assistance, and building partnership with the regulated industry

Box 4.4: Cooperative approach for SMEs – good practice example from Kolkata

Small scale industries were found to contribute 44% of the overall particulate emissions in a central area of Kolkata. The emissions largely came from the use of older, energy inefficient coal fired units for the manufacturing processes, such as small boilers, ceramic kilns, and cast iron foundries. The WB PCB adopted a stricter particulate emission standard and intensified enforcement efforts targeting units located in that area. For most of then units using small coal fired boilers a change to an oil fired boiler (typically using a light oil) was need to meet the standard. In order to facilitate compliance, a fund was created at the WBPCB with the support of the India-Canada Environment Facility, to assist small scale industries in financing the cost of measures that would result in meeting the standard. Since natural gas network is not available in Kolkata, a typical measure was to replace a coal boiler with a more energy efficient and cleaner oil fired boiler. The fund provided a matching grant (50% of capital cost) paid *after* the conversion was implemented. The WB PCB also involved industrial associations that helped to reach out to the units and provide technical advice. A recent assessment of pollutant emission reduction after the adoption of new standards and establishment of the fund showed a reduction of about 98% of the total particulate matter from the units who had completed the conversion from coal to oil fired units. (Source: http://www.wbpcb.gov.in/)

Mainstreaming Environmental Agenda through Enhanced Role of Industrial and Mining Sectors

4.18 The sector institutions have an extremely important role in ensuring better environmental management both through regulatory means and through partnership that may influence the choice of

production technologies locations or corporate stewardship. Many of the industries are represented by industrial associations at the national level and in some states have programs to provide technical assistance and create awareness of environmental management and pollution control issues by its member industries. For example, the Orissa Sponge Iron Manufacturers Association (OSIMA) has taken a number of voluntary initiatives such as providing support for monitoring and developing guidelines for compliance. However, not all industrial associations in Orissa are able to provide environmental awareness and technical assistance for its members and a significant number of SSI units are not active members of industrial associations. The industry and mining sectors need to take a pro-active role in creating environmental awareness, providing technical assistance, and serving as environmental mentors or stewards.

V. Building Public Trust in Environmental Management: Role of Public Participation

Strengthening Public Consultation Process

4.19 There is a trend of increasing number of PILs and court cases[5] in Orissa, which indicates growing public demand for better environmental quality and accountability. The number of environmental controversies in the regulatory arena will most likely continue to grow as new investors and developers propose new industrial or mining projects in the state. Affected communities are principal stakeholders of environmental management, increasingly demanding greater accountability for environmental impacts and more and more often resorting to public interest litigation. In addition to and as a way of strengthening the effectiveness of public hearing process (renamed as "public consultation" by the new EIA notification, 2006), it would be important to develop "community participation" programs by DoE and OPCB aimed at educating and pro-actively communicating with community stakeholders on the impacts and benefits of the proposed development activities. Such programs could involve smaller and more frequent meetings with communities prior to a "formal' public consultation; interactive approaches to educating the public through training sessions and the publication and dissemination of regular environmental updates. It should also allow designated regional officers (and provide them with sufficient time) to work with the community to better understand local concerns, and adoption of user friendly procedures to ensure the fullest access to information under the Right to Information Act. It is also important to expand programs for involving citizens in environmental monitoring, building on the successful experience of a few "watch-dog" committees, particularly for small industries and mines, where the transaction costs of monitoring by OPCB through traditional methods are too high

4.20 One immediate measure that can be pursued is to provide specialized training for agency staff in the importance and use of a variety of public participation techniques or approaches and how to properly use them. The skills and techniques to be covered would include: issue identification and management, listening and communication, consensus and vision building, community outreach and partnering, negotiation and alternative dispute resolution. If training is not feasible, OPCB should consider employing professional facilitators or engaging respected community leaders to assist with public hearings and serve as a communication bridge between the regulator and community.

4.21 Civil society, particularly vulnerable tribal communities, often lacks the understanding of the costs and benefits of proposed projects and how these projects will affect them in economic, social, and environmental terms. This has shown to limit the effectiveness of the public hearing /consultation, and sometimes enabled the consultation process to be captured by outside interest groups. Increasing the capacity of civil society to understand these underlying issues by providing training on technical or

[5] Approximately 248 environmental cases have been filed till 2005-06 since 1986-87 against polluting units in Orissa.

scientific issues is another way of ensuring more meaningful and effective public participation and empowering communities in the decision making process.

Public Awareness and Outreach

4.22 The DoF&E, through the Centre for Environmental Studies (CES) as the nodal agency, had developed some programs for promoting community awareness and increasing community involvement in Orissa. However, these programs have limited effectiveness in creating public awareness and outreach. The CES[6] which is promoting a network of NGOs and eco-clubs in each of the districts and acts as an ENVIS center, suffers from acute resource and capacity constraints. Also the DoF&E has established District Environment Societies (DES) across all 30 districts in the state, but the DES have been dormant groups and presently do not play an active role in public awareness or community involvement.

4.23 The OPCB needs to strengthen mechanisms to undertake information dissemination and mass public education programs as currently mandated. Neither the OPCB nor CES regularly produce or disseminate information on environmental issues, regulatory activities, or give advice to individuals or communities on how they can reduce pollution. Environmental information that is consumer oriented, and not technically focused, should be regularly provided to communities through the local print media, agency newsletter, regional offices, or local community centers. In addition, the OPCB needs to ensure that staff respond timely to information requests and that procedures for dissemination of information are user friendly. Without these assurances, implementation of the Right to Information Act will have limited effectiveness in bringing the intended results.

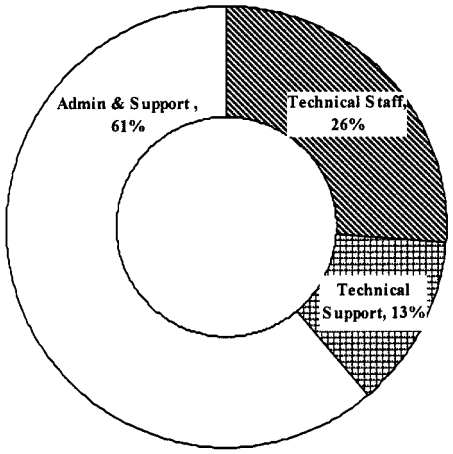
[6] CES has established 150 eco-clubs in each of the 30 districts, forming about 4500 clubs; established a network of about 600 NGOs; and acts as Environmental Information Collection and Dissemination Center - a country wide system designated by MoEF for the State.

VI. STRENGTHENING THE ENVIRONMENTAL REGULATOR

Securing adequate human and financial resources

4.24 There are significant capacity constraints that OPCB faces currently. The ratio of available staff to number of polluting units has been gradually deteriorating due to increased industrial activities and freeze on recruitment to state government agencies in Orissa, while the number of requests for consent has increased from 644 in 2004 to 668 in December 2005 and is expected to increase further over the next few years. As of December 2005, the OPCB had 220 sanctioned staff positions[7], of which 58 were technical positions and the remaining technical support or administrative positions. In comparison, some SPCBs have a much higher distribution of technical versus non-technical staff, according to the Planning Commission evaluation of SPCB performance nation-wide (for year 2000). For example, the Karnataka PCB had an impressive ratio of 64:34 technical versus non-technical staff. Many technical resources are assigned for management of CTE and CTO, which remains one of the core tools used by OPCB to ensure environmental safeguards both during planning and implementation stages of industrial and mining sector development.

Figure 4.2: Apportionment of Human Resources available in OPCB, December 2005



Source: Background Report on Institutional Capacity needs assessment, ERM, 2006

4.25 There is a broad recognition in Orissa that a critical staffing shortage adversely affects OPCB's capacity to deliver on their core functions, such as consent management and compliance monitoring that are considered critical to the expansion of the industrial and mining sectors in the state. In light of increasing number of applications from key sectors, the GoO has recently approved nine positions for OPCB that will help ensure that critical core functions are performed. This is an important step. Furthermore, with increasing growth and public pressures, a periodic assessment of capacity and staffing needs at both the regional and central offices will be required.

4.26 In terms of financial resources, nearly 39% of OPCB revenue[8] comes from fees charged from renewal of consent (CTO) and grant of consent (CTE). The fee charged by OPCB for consents is relatively less when compared with other SPCBs and the fee has not been revised since 1998. For example, the CTE fees charged by OPCB is 15% of the fees charged by the Maharashtra PCB and 50% of

[7] Against which only 170 staff are in position as of December 2005.
[8] During 2004-05, the consent fee collected amount to INR 31.78 million out of the total revenue of INR 81.52 million.

the fees charged by the Karnataka PCB. Given the expected increase in demand for consents from the industrial and mining sectors, the OPCB should re-evaluate the current fee structure and better align it with the expected costs associated with meeting increased demands and expected higher level of scrutiny by the public.

Outsourcing Non-core Functions of Environmental Research and Monitoring

4.27 In order to effectively perform its environmental management responsibilities, the OPCB needs to provide comprehensive environmental data to inform decision-making. It has established a Pollution Assessment, Research, Development and Monitoring (PARDM) cell to undertake this mandate. Most of the cell's focus has been on providing background environmental quality monitoring data, partly because of the available funding from central agencies such as CPCB and MoEF. The OPCB has infrastructure resources such as monitoring equipment, accessories, and mobile vans for monitoring, but the laboratory resources are generally outdated and cannot effectively perform bio-monitoring, micro-pollutants, and metal analysis necessary for the background environmental quality monitoring program. Constrained by availability of technical staff resources to perform this mandate effectively, the OPCB has not been able to give priority to this function. To overcome this challenge, functions that do not relate to legal obligations could be outsourced to private consultants or research institutes with expertise in environmental quality monitoring, pollutant standards, alternative treatment technologies, and other specific technical areas.

Improving Environmental Management through Greater Cross-sectoral Coordination in Policy and Planning

4.28 As Orissa's growth strategy accelerates, the coordination of cross sectoral agency roles and responsibilities will become increasingly important. There are significant opportunities and a number of areas where alignment of sectoral policies and programs with environmental considerations would go a long way in achieving overall improvement in environmental management, particularly in the industry and mining sectors. Examples of such opportunities exist through Industrial Facilitation Act, proposed Mining Sector Development policy, Single Window Clearance system and Environmental Management Plans in the mining sector. Responsibility for environmental management of mines is shared between MoEF/OPCB and DoS&M/IBM. The IBM and DoS&M are responsible for the licensing and operations of mines, while the MoEF and OPCB are responsible for ensuring their compliance with the provisions of the Air and Water Acts and the EIA clearance process. Cross sectoral coordination could also be strengthened by establishing protocols for inspection, conducting joint inspections, outlining procedures for conflict resolution, and sharing environmental and inspection reports by respective agencies.

4.29 Traditionally, the planning process, including the choice of location and technological processes, are driven by business requirements and these choices strongly influence the extent and nature of environmental impacts. Given the fact the most new investments in the state are and will be located in environmentally sensitive areas, the current work by CPCB and OPCB in developing zoning atlas should be extended to all sensitive areas or districts. The DoI and DoS&M should also encourage the use of these zoning atlases by planners to decide the most suitable areas for investment and zones for new industrial and mining projects.

4.30 Another area to be considered in the enforcement arena is the level of cooperation that is sought and available from other agencies of government. The GoO has already issued directions to district administrations to cooperate with OPCB through a government order. This action of GoO has improved the situation to a large extent. However, with some other utility service providers and raw material suppliers, the OPCB can proactively enter into an agreement or understanding with organizations

involving its senior management. This will improve the coordination between OPCB officers and utility service providers at various levels.

VII. TOWARDS STRONGER AND EFFECTIVE INSTITUTIONS: AN ACTION PLAN

4.31 Based on this institutional analysis, several recommendations have been proposed for creating stronger and more effective institutions to manage the environmental impacts of rapid growth in the State in the following key areas:

Accounting for all Critical Polluters in the State and Improving the Effectiveness through Risk Based Approach

- Inventory all industries and mines operating in the state to update the consent management database with OPCB, reviewing and cross verifying with the list of entrepreneurial activities registered with DoI, DIC, DoS&M, and IBM

- Establish an amnesty program to invite unregulated industries and mines to register and obtain consent under simplified procedures and after amnesty period, launch an aggressive inspection program.

Improving the Effectiveness of Compliance and Enforcement

- Explore new regulatory approaches and compliance incentives for small-scale enterprises and small scale industries, including financial assistance programs tied to meeting regulatory standards

- Evaluate, refine and expand the bank guarantee system to strengthen compliance incentives for medium and large highly polluting industries

- Encourage industries to submit self monitoring data by introducing regulatory incentives, such as reduced inspections, for industries who can demonstrate a consistent record of compliance

- Strengthen enforcement procedures for public complaints, monitoring, inspection, collection of evidence, and prosecution of cases.

Enhancing the Role of Public Participation

- Engage affected communities early in the planning process through small and frequent meetings and create an understanding of both the costs and benefits of the proposed project

- Provide specialized training to agency staff on effective public participation techniques, such as consensus building and alternative dispute resolution, and use professional facilitators or respected community leaders to assist with public hearings

- Establish user friendly procedures to implement the Right to Information Act and ensure that information on consent management, compliance and enforcement, EIA applications and approvals, and environmental monitoring data is collected, updated, and accessible on OPCB's database.

Strengthening the Functions and Capacity within OPCB

- Improve the capacity of the regional offices for consent management, monitoring and inspection and realign resources, based on current and expected future needs

- Improve a balance between workload and staffing level through outsourcing of non-legally obligated functions, such as research and monitoring, increasing process efficiency where possible and hiring additional staff with required technical skills.

Improve Alignment with Cross Sectoral Priorities

- Develop joint protocols and joint teams for inspection of the mining sector between DoS&M and OPCB and consult on environmental management plans and inspection reports

- Expand the development of zoning atlas to all sensitive areas and districts; link zoning guidelines to granting a CTE, starting with particularly sensitive and/or populated areas, in order to facilitate their use during the planning process to determine the most suitable areas for investment and zones for industrial and mining projects.

5. A WAY FORWARD

5.1 Orissa now stands at the crossroads of success. The recent boom in the prices of mineral-intensive products has led to a wave of domestic and foresighted investors in the mineral-intensive industries and presented the state with an opportunity to capitalize on its natural wealth and build a prosperous economy where the benefits of growth reach all its citizens. The government has acted upon this opportunity and undertaken an initial set of reforms that have yielded encouraging results, as particularly seen in reduced fiscal deficit and accelerated rate of growth. It is further developing and implementing a comprehensive vision and strategy to sustain these achievements, further accelerate growth and make it more inclusive. Managing the environmental and social impacts of accelerated mineral-intensive growth is an integral part of this strategy, and central to lasting success. The improvements in policies, institutions and implementation mechanisms need to be achieved at a pace matching the demands of rapid growth and massive expansion of the mineral-based investments, which would require further significant efforts.

5.2 The report has re-emphasized the principal role of Orissa's environmental agencies, such as the OPCB and the DoF&E, in assuring the sustainability of growth and strengthening public support of the economic reform agenda. At the same time, it has also highlighted the important role that sectoral agencies, such as the DoI and the DoS&M, have in the oversight of industrial and mining projects, including participating in the development and implementation of a robust framework for social and environmental risk mitigation. As the state's resource and pollution intensive growth patterns has the potential to disproportionately affect its poorest citizens, particularly tribal communities, creating such a "sustainable growth framework" is necessary for pro-poor and inclusive development path.

5.3 The study findings and recommendations, produced in close cooperation with DoFE, OPCB and DoS&M, and in consultation with other stakeholders, can be grouped into three broad categories (see also Annex 1: Action Plans of the report, for a detailed list):

- Enhancing opportunities for inclusive growth and poverty reduction through mineral-intensive investment;
- Strengthening environmental management;
- Improving linkages between environmental and sectoral policies and processes.

I. ENHANCING OPPORTUNITIES FOR INCLUSIVE MINERAL-INTENSIVE GROWTH

5.4 Several of Orissa's recent policy initiatives represent a significant milestone in the development of a systematic approach to addressing social and environmental "externalities" associated with the growth in the industry and mining sectors. There appear to be two principal areas on which future efforts should focus: one, increasing the effectiveness of institutional implementation of policies and two, restoring the earning capacity of affected communities.

5.5 A review of regional and international experience with benefit sharing schemes concluded the following:

- A *flexible* benefit sharing instrument is needed that can be tailored to local needs and accommodate diverse industry structures and management capabilities based on negotiation and voluntarism and restoring earning capacity;
- Pooling resources and addressing collective action problems may be effective in areas with multiple small scale mining. In case of a large mining company particularly with a local government capacity over-stretched, it is more likely that the company would take responsibility

for supplying benefits in the form chosen by communities. This may however lead to community dependency on the mining company;

- Supplying benefits through public goods that leave durable development outcomes and promote economic independence should be seen as first preferred option, while the cash payments may be the last resort in areas that lack service delivery capacity, or where trust of local institutions remains weak; and
- Meaningful community representation calls for awarding greater rights to affected parties over development decisions that affect their livelihoods. The Development Forum approach will most likely succeed in small and relatively homogenous communities (such as many tribal communities), mainly exposed to mining activities by one large company.

5.6 In the context of Orissa, governmental departments such as MoS&M, MoI, MoP&C could promote greater social inclusion through peripheral development plans and benefit sharing mechanisms adopted with meaningful community participation. In addition, greater accountability is needed through adoption of a pro-active public engagement campaign by all agencies that increases the information made available to the public and integrates community stakeholders earlier in the project planning and decision-making process.

5.7 The lessons from international and local experience, summarized in the study, are expected to help GoO, in consultation with other stakeholders, to further strengthen the framework for peripheral development in mine-affected areas it has already started putting in place. Based on the emerged lessons GoO should initiate the design and implementation of pilot benefit sharing schemes in different settings. It is also important to extend an analysis of the impact of mining development, undertaken in the two districts, to other areas with different mix of mining companies and communities, to provide a full picture of the impacts and community needs. Given the significance of and close linkages between the environmental and social issues in mining development, a strategic environmental and social assessment of the mining sector could be a useful tool to support the formulation of sustainable mining development framework.

II. Strengthening Environmental Management

5.8 There are multiple institutions within the policy framework which have a role in environmental management, with both common and unique institutional challenges. The study analysis and stakeholder consultations found these challenges fell into the three primary areas –strengthening regulatory processes and tools, improving information sharing and public consultation, and enhancing capacity of regulatory agencies. While the specific needs were analyzed and identified in detail for one of the key state-level environmental institutions, namely, the OPCB, the study also pointed to important areas of strengthening environmental management capacity of the mining regulator and a scope for greater collaboration between the two regulatory authorities on environmental issues of common interest and responsibility. In particular, key findings include:

- The enforcement mechanisms to ensure compliance need to be further strengthened. This includes greater coverage and efficiency in monitoring and inspections practices and complementing the current system of traditional enforcement tools with innovative approaches, such as the Bank Guarantee System recently introduced by OPCB. While DoE and OPCB have embarked on several very promising initiatives, evaluating, refining and expanding these initiatives, as well as developing additional programs to target different categories of priority pollution sources are needed.
- Many industries (or other polluters such as municipal sources) still have rather few incentives to comply voluntarily. Collaborative compliance assistance schemes for small industries and mines

that face particularly high costs of compliance relative to the overall cost of business are needed to be pursued. On the other end of the spectrum, rewarding good compliance and voluntary initiatives by industry through regulatory incentives (such as consent duration, frequency of inspection, etc.), using successful experiences in some other states, is another opportunity to promote better environmental performance.

- To absorb the magnitude of growth that is expected in the extractive industry and mining sectors, an integrated system of risk management is essential to ensure that development can be sustained in an environmental and socially sensitive manner. This will require the development of procedures and mechanisms for mine closure, the adoption of guidelines for proper consultation, and the preparation of community (peripheral) development plans supported by suitable benefit sharing schemes, which could be initially piloted in selected areas.
- Strengthening the environment regulator to perform its increasing responsibilities effectively and efficiently is critical for supporting new much-needed investments and building a broad based consensus on the Orissa growth strategy. While important first steps have been taken by the GoO and OPCB, such as decentralization of regional offices and additional staffing, a period of systematic assessment of - and action upon - capacity and staffing needs including staff skills and training, is necessary.

III. Improving Linkages between Environmental and Sectoral Policies and Processes

5.9 The regulation of mines involves multiple agencies at both the central and state level of government with different regulatory authority and responsibilities. While the Indian Bureau of Mines has the responsibility to approve production leases and mining plans, including an environmental management plan, the MoEF has responsibility for EIA clearances and the OPCB for approving consent management. The delineation of roles and responsibilities is sometimes unclear, especially when it relates to the monitoring of environmental conditions and supervision of environmental management plans. Greater cross sectoral communication and coordination is required to ensure that gaps in regulation do not exist and maximize the efficiency of limited resources. To the extent possible, this should involve institutionalizing mechanisms for cross sectoral coordination such as establishing joint protocols and teams for inspection of mines and linking information management systems.

5.10 **In conclusion,** rapid growth that is projected for the state of Orissa brings promising future opportunities for economic development and poverty reduction. To realize these opportunities requires, among other reforms, a comprehensivel and effective management of environmental and social impacts of mineral-intensive growth. The challenge is enormous given the legacy of insufficient attention to these issues in the past, the scale of expected new investments, and capacity constraints of government and community institutions. Importantly, the government has embraced a broad-based growth agenda and is moving forward in a more environmentally and socially responsible manner than in past, demonstrated by a series of recent initiatives. Building on this momentum, the study has developed, through analysis and extensive consultation with GoO and other stakeholders, a set of specific recommendations with respect to improving environmental management and social integration that can pave the way for continued (medium-to long-term) effort to build an enabling framework for inclusive and sustainable growth

Action Plan A - Institutional Capacity Building at Orissa State Pollution Control Board

Actions	Responsibility for implementation	Timeframe
Accounting for Critical Polluters and using Risks Based Approach for Consent Management		
• Expand scope of consent management by inviting unregulated industries and mines to obtain consent under an amnesty program with simplified procedures	OPCB ROs supported by the HQ	Medium term measure (2-3 years)
• After amnesty period expires, launch an aggressive inspection program to bring all operating industries and mines in compliance	OPCB (HQ) supported by the RO	Long term measure (3-5 years)
Improving Effectiveness of Compliance and Enforcement		
• Explore new regulatory approaches involving compliance incentives for small scale enterprises and small scale industries, including technical and financial assistance programs tied to meeting regulatory standards	OPCB (HQ) supported by the RO	Short to medium term measure (1-3 years)
• Encourage industries to submit self monitoring data by introducing regulatory incentives, such as reduced inspections, for industries who can demonstrate a consistent record of compliance	DoFE and OPCB	Medium to long term measure (2-5 years)
• Strengthen enforcement procedures for filing of public complaints, monitoring compliance, routine inspections, collection of evidence, and prosecution of cases	OPCB (HQ) supported RO	Medium term measure (2-3 years)
• Train staff on improved procedures and guidelines for monitoring, inspection and enforcement through implementation of a pilot demonstration in one of the regional offices	OPCB (HQ) supported by RO	Short to medium term measure (1-3 years)
Strengthening the Functions and Capacity within OPCB		
• Establish a common entry point for consent management system at the regional offices consistent with single window clearance	OPCB (RO) supported by HQ	Medium to long term measure (3-5 years)
• Strengthen the capacity of the regional offices for consent management, monitoring and	OPCB (HQ) supported by RO	Short to medium measure (1-3 years)

inspection and realign resources based on current capacity and expected future needs		
• Improve balance between workload and staffing level through outsourcing of non-legally obligated functions, such as research and monitoring, increasing process efficiency where possible and hiring additional staff with required technical skills (subject to making a strong and verifiable case)	OPCB (HQ) supported by RO	Short term measure (1–2 years)

OPCB – Orissa Pollution Control Board
RO – Regional Office
DoF&E – Department of Forest and Environment

Action Plan B - Improving Environmental Management Practices in Industry and Mining Sectors

Actions	Responsibility for implementation	Timeframe
Expanding the universe of regulated industries and mines with environmental management practices		
• Undertake an inventory of industries and mines (both operational and abandoned) to develop a comprehensive database and run the inventory verification periodically (every 5 years) to improve environmental management of industry and mines	IPICOL supported by OPCB, DoS&M,	Short to long term (1-5 years)
Promoting awareness and tools for improved environmental management		
• Undertake a sustained environmental awareness program focused for each of the sub-sector industries and mines by partnering with industrial and mining associations and government corporations/bodies.	OPCB supported by IPICOL, DoM&S	Short to medium term measure (1-3 years)
• Link industrial promotion incentives, such as tax holidays or soft loans, to environmental risks and performance, particularly for hazardous processes	DoI (lead) supported by OPCB and DoF	Short to medium term (1-3 yrs)
• Prepare and disseminate industry specific environmental guidelines for the benefit of industry sector stakeholders	OPCB, DoI	Short to medium term measure (1-3 years)
Improving Cross Sectoral Coordination and Alignment of Policies		
• Develop agreed upon protocols for joint inspection, information sharing and monitoring of environmental issues in industry and mining sector	DoFE or PCB supported by DoI, IPICOL, DoS&M	Short to medium term measure (1-3 years)
• Expand the development of zoning atlas to all sensitive areas and districts and link zoning guidelines to granting a consent to establish, starting with particularly sensitive and/or populated areas, in order to facilitate their use during the planning process to determine the most suitable areas for investment and zones for industrial and mining projects	DoI/IPICOL and DoS&M/IBM supported by CPBC/SPCB	Short to medium term measure (1-3 years)
Strengthening Environmental Management in Mining Sector		
• Undertake baseline assessments and priority action plan to support the preparation of the sustainable development strategy of mining sector (strategic environment and social	DoS&M supported by IBM	Short term measure (1-2 years)

Actions	Responsibility for implementation	Timeframe
assessment and mineral resources assessment)		
• Develop compliance procedures and mechanisms for mine closure	DoS&M supported by IBM	Short term measure (1-2 years)
• Prepare guidelines for proper consultation; community development plan and benefit sharing including pilot development plan in a selected mining area	DoS&M supported by IBM and OPCB	Short term measure (1-2 years)
• Strengthen mineral sector agency capacity, primarily at level of district mineral administration through training, process enhancement and equipment renewal, as per needs assessment	DoS&M supported by IBM	Short – medium term measure (1-3 years)

IPICOL	Industrial Promotion and Investment Corporation of Orissa Limited
DoS&M	Department of Steel and Mines
DoF&E	Department of Forest & Environment
IBM	Indian Bureau of Mines
SPCB	State Pollution Control Board

Action Plan C for Improving Community Involvement in Environmental Management in the State of Orissa

Actions	Responsibility for implementation	Timeframe
Ensuring greater accountability of performance by expanding role of public participation		
• Ensure all relevant information on consent management, compliance and enforcement, EIA applications and approvals, and environmental monitoring data is collected, updated, and accessible on OPCBs	DoFE and OPCB (HQ)	Short to medium term measure (1-2 years)
• Establish user friendly procedures for public access to this information to ensure effective implementation of the Right to Information Act. The OPCB database should be made **publicly available** in real time on the web	DoFE and OPCB (HQ)	Short term measure (1-2 years)
• Increase public role and participation in compliance through involvement of local government in citizen monitoring	OPCB (RO) supported by HQ	Short to medium term measure (1-3 years)
• Engage affected communities early in the planning process through small and frequent meetings and use local governments and ROs to establish stronger links and understanding with the community	OPCB (RO) supported by HQ	
• Increase public role and participation in compliance through involvement of local government in citizen monitoring	OPCB (RO) supported by RPI	Short to medium term measure (1-3 years
Improving environment and sector agency strategies for public participation		
• Formulate and deliver a sustained environmental awareness program to educate the community stakeholders; and increase public participation. Identify a pilot district (same as benefit sharing pilot district) for formulating and implementing the community involvement and awareness program	DoFE supported by DoS&M	Short to medium term measure (1-3 years)
• Develop advocacy and communication strategy to proactively disseminate key environmental implications and benefits of industry and mining projects	Department of P&C supported by DoF&E	Short Term measure (1-2 years)
• Provide specialized training to agency staff on effective public participation techniques, such as consensus building and alternative dispute resolution, and use professional facilitators or respected community leaders to assist with public hearings	OPCB (HQ) supported by RO	Short to medium term measure (1-3 years)

Annex 1

Summary of Good International Practice in Mining Legislation

MINERAL POLICY

Governance	
guiding principles, ownership of mineral resources, economic contribution of the industry, role of the states	includes: • honoring the constitution the policy provides the intent of the government, and laws and regulations are viewed as instruments for guidance. • principles may include sustainable development, poverty abatement at the community level, and self determination. • role of the state as owner of mineral resources, the role of minerals in the national interest, and provisions for assigning mineral rights to third parties for investment and development
environmental, and social objectives at the regional & local scale, including community consultation and management plans	• defining national, regional and local expectations for resource development – guided by the principles of sustainable development • ensure the framework for addressing social impacts (avoidance, mitigation, and compensation) for which laws and constitutional protections apply; are consistent, complementary and mutually reinforcing, of the community consultation framework and community development plan. • ensure that social impact mitigation measures are adequate for community consultation and community development plan to be satisfactory, acceptable to the community, and sustainable. • safeguard policies for large and small scale mining
mineral access, licensing, appeals, and dispute resolutions	• transparent, non-discriminatory public access to mineral resources through the provision of mineral rights, subject to compliance with the Mining Law and Mining Regulations
Economic: Business Climate	
equal treatment of investors, sector growth and promotion through private sector	• equal access to mineral resources for both domestic and foreign investors through transparent, non-discriminatory sector regulation • the state encourages exploration and development through a competitive business climate, international best practices in regulatory and fiscal policies
transparency of the licensing process, fiscal and regulatory performance	• clear procedures for acquiring mineral rights, preference given to applications according to the order they are filed. • stability of investment terms, terms of agreements • administrative reforms and institutional strengthening to improve governance in the sector
revenues management and transparency	• endorsement of the extractive industries transparency initiative, and / or other revenues management, transparency initiatives.
Environmental: Stewardship	
risk assessment & management, health	• safeguard the environment through environmental impact assessment and environmental management plans

& safety, mine reclamation	• requirements for public / community consultation • health & safety standards for workers and affected communities • reclamation of mining lands, including obligations for planned and abrupt closures
Social: Mining & Communities	
community consultation frameworks	• a framework for community consultation in mine planning, development, ongoing operations, closure, and post-closure • identification of stakeholders, assignment of roles and responsibilities linkages between consultation on social / environment assessment and management; and community development plans (and perhaps benefit agreements)
resettlement & compensation	• ensure consistency between social impact management (avoidance, mitigation, and compensation) and community development plans • social management is consistent, complementary and mutually reinforcing of the community consultation framework and community development plan. • social impact mitigation measures and safeguards are adequate for community consultation and community development plan to be satisfactory, acceptable to the community, and sustainable.
community well-being	• policies for empowerment of disadvantaged ethnic groups and/or indigenous people • gender, family, and substance abuse prevention and control
Sustainable Development: Implementation	
land-use planning, mine closure planning	• integrated mine development planning with regional land-use through the community development plan, consideration of post-closure rehabilitation / re-use of facilities and land • retraining and redeployment of workers, re-conversion of plant site, community sustainability
capacity-building education	• commitment to building capacity within communities and institutions at the regional and local level
local economic development	• policies to foster small-to-medium enterprises at the local level using mining as an engine of growth. • integration into the community development plan
role of stakeholders	• roles and responsibilities of the state, regional governments, community, NGO's, and company using the stakeholder analysis and community consultation framework • possible partnerships and other third-party contributors • inter-regional cooperation defined within the community development plan
outcomes	• use the community consultation framework to assign roles and responsibilities in defining sustainability indicators, monitoring, reporting, and adjustment mechanisms as defined within the community development plan
HIV/AIDS	• a policy to address the problems of HIV/AIDS infected staff and communities, and specific short, medium, and long-term strategies to arrest the spread of infection

MINING LAW AND REGULATIONS

Introduction	
purpose & scope of law, objectives, ownership of resources, role of the state	• the role of private investment, definitions for key terminology, scope of law • role of state and objectives in regulating the sector • provision for state ownership with private sector development
Economic	
security of tenure, transparent licensing framework	• suitable guarantees against arbitrary actions that would threaten mineral rights • a licensing framework that grants licenses in the order of application filed, rights provided, to whom, how, and under what obligations
sector growth	role of the private sector, economic expectations
licensing framework	• type and issuance of mineral rights, flexible timing of programs, the right to proceed from exploration to exploitation subject to regulatory compliance • ability and provisions to file for extensions of mineral rights, renewal, transfer, relinquishment, withdrawal, termination • rules for cancellation of rights • obligations of mineral rights holders • dispute resolution, sharing of infrastructure, safeguards for the protection of cultural heritage, vulnerable groups, and communities in general
obligations for fees, duties, royalties	• obligations on holders of mineral rights to pay taxes, duties, and royalties; authorized agency for collection • procedures, schedules for payment, and applicable rates
taxation, special provisions, and stability	• authorized agency to provide financial tax provisions, including amortization of pre-production expenses, (accelerated) depreciation of capital investments, and loss-carried-forward. • authorized agency to provide for financial stability, period, courses of actions if stability is involuntarily terminated
secondary processing of materials	• prevailing regulations on secondary sources (scrap, waste, recycling). • provisions to encourage value-added mineral processing
informal and small-scale mining	• special provisions for the issuance of mineral rights, regulatory compliance, and / or financial obligations of small-scale and artisanal miners • safeguards against child and forced labor, disabled persons, use of hazardous chemicals, control of black markets
other activities	• provisions relating to crafts, gemstones, and fossils
fiscal requirements: closure funds / environmental guaranty	• obligations to provide financial certainty of funds to cover mine closure • obligations to provide financial certainty of funds to cover environmental abatement, mitigation, and clean up in the case of accidents; and tax treatment of instruments used
initial closure plan:	• obligations to provide a comprehensive initial mine closure plan as part of licensing, including consideration of impacts and remedies as defined in the environmental and social management plans • procedures for the orderly transition of company sponsored programs on mine closure • procedures for regular update and consultation of the plan
violations, penalties, and powers of	• actions that constitute violation of the law, references to applicable civil and criminal penalties, the civil and criminal powers of the state and

enforcement	enforcement powers
dispute resolution and appeals	• dispute resolution procedures, including voluntary arbitration, rights of recourse to international courts, mechanisms and procedures for filing appeals, and time limits
revenue sharing with communities	• a provision to share revenues from mining (i.e. royalties and fees) with local impacted communities, as defined in the community development plan • mechanisms to direct mining contributions from central accounts to local accounts as defined in the community development plan
Environmental Stewardship	
risk assessment & management, health & safety, mine reclamation	• safeguard the environment through environmental impact assessment and environmental management plans • requirements for public / community consultation • health & safety standards for workers and affected communities, required emergency preparedness plans • reclamation of mining lands, including obligations for planned and abrupt closures
mine reclamation	requirements for mine area reclamation, rehabilitation, restoration of flora and fauna, performance standards, and penalties for non-compliance
Social: Mining and Communities	
community consultation	• requirements for community consultation in mine planning, development, ongoing operations, closure, and post-closure • requirements for stakeholder identification, assignment of roles and responsibilities regarding consultation and methodologies to integrate communities into planning and execution of programs • requirements on the company, community, government in linking social / environment assessment and management; and community development plans • requirements (if any) relating to benefit agreements
resettlement & compensation	• requirements placed on the company to ensure consistency between social impact management (avoidance, mitigation, and compensation) and community development plans • requirements placed on the company to ensure social management is consistent, complementary and mutually reinforcing of the community consultation framework and community development plan. • requirements placed on the company to ensure social impact mitigation measures and safeguards are adequate for community consultation and community development plan to be satisfactory, acceptable to the community, and sustainable.
community well-being	• requirements placed on the company for empowerment of disadvantaged ethnic groups and/or indigenous people • gender, family, and substance abuse prevention and control
Sustainable Development: Community Plan	
economic closure planning	obligations on stakeholders in the preparation and execution of mine closure (to be defined in the community management plan): • requirements for fostering local economic development • the transition of programs away from the company on mine closure • conditions and provisions for transfer of infrastructure, facilities and lands
environmental closure planning	obligations on stakeholders in the preparation and execution of environmental closure plans, (to be defined in the community management plan):

	• reclamation plans • creation of habitat, biodiversity, and protected areas • ongoing monitoring and reporting
social closure planning	obligations on stakeholders towards economic sustainability (to be defined in the community management plan) • re-skilling and redeployment of labor • provisions for education partnerships • incentives for re-conversion of closed facilities
informal & small-scale mining	• provision of the legal status of informal / unlicensed operators, and registration processes • provisions for assistance on legal & administrative, health & safety, technical training, environmental protection, and access to fair & competitive markets.
Administration of law	
competent authorities	• responsibilities of regulatory offices (Mines Inspectorate, Mining Cadastre, Geologic Survey), and protocols for regulatory inspection and controls.
misc. provisions	• the collection and dissemination of geological and exploration data, and terms of confidentiality • administration of geological databases and distribution of geologic information • system for the classification of mineral resources • the promulgation of regulations and treatment of existing mineral rights and the procedure for repeal of law. • the right of the state for public inspection • authorizations to build and maintain infrastructure, and process, transport, store, and sell mineral products • violations, civil, and criminal offenses and penalties.

Annex 2

International Experience with Royalty and Benefit Sharing[9]

In most countries benefit sharing is funded from royalty distribution mechanisms. Every country is unique with its own legal system, history, political institutions, interest groups, levels of economic development and dependence on mineral production. In some cases, royalties are designed along with the other taxes that are imposed on mineral firms as part of an integrated package. In other countries, such as Peru, royalties are introduced separately, as an add-on to existing mineral taxation. So it is not surprising that the size and nature of royalties are tailored to meet the special needs of each country. The following are some examples of royalty distribution mechanisms from three regions: Africa, Asia and Pacific and Latin America.

(1) Africa

The methods of revenue distribution and beneficiaries of mineral royalties vary widely in Africa. Administration is mostly at the national level for the benefit of the general fund. This implies that mineral royalty funds lose their identity upon entry into the fiscus and are added to the government revenue pool. South Africa is an example of having a central fiscus from which funds are distributed to pay for services and for apportioning to lower levels of government. Mozambique does it differently. Its mining law provides for a percentage of royalties to be paid directly to lower levels of government (Mining Code, Law No.14/2002 of June 26, 2002). Some countries, for example, Ghana and Namibia, have created a minerals development fund (MDF) for distribution purposes.

Ghana.

Ghana has created a minerals development fund to return part of the royalty income to communities directly affected by mineral development. Of collected mineral royalties, 20 percent are paid into the fund. Proceeds are then shared among the local government authority, landowner, and communities that are adversely affected by mining.

Namibia.

Namibia has also created a minerals development fund , but its expenditure is more broadly targeted than in Ghana. The Namibian MDF is aimed at the following:

- Promoting and supporting all aspects of mining.
- Broadening the contribution of the mining sector to the national economy through diversification and by stimulating economic linkages.
- Providing funds for the development of training and education facilities and programs.

South Africa.

South Africa has introduced an alternative revenue distribution with its newly promulgated Mineral and Petroleum Resources Development Act (MPRDA). Although there is no provision for lower levels of government to benefit through mineral royalties, local communities have the potential to benefit substantially.

- They are given the option to obtain a "preferent right" "(Mineral and Petroleum Resources Development Act 28 of 2002, 3 October 2002) over land and minerals registered in their name, which effectively gives such a community negotiation powers equal to those of the owners of the mineral rights and fosters community development and social uplift. To receive a preferential right, the community must submit a development plan to the Department of Minerals and Energy, which

[9] Extract from "Mining Royalties – A Global Study of Their Impact on Investors, Government, and Civil Society", J. Otto et al. - 2006

can be easily renewed for 5-year periods. A preferential right permits the holder to either prospect or mine for the benefit of the community or, alternatively, to lease such rights to a mining company for a fixed consideration payable directly to the community.

- The charter to the MPRDA gives preferential treatment, in accordance with black economic empowerment, in mine ownership, procurement, employment, and community inclusion into mine decision-making structures.

(2) Asia and Pacific

Within the Asia and Pacific region most governments bring all royalty-type taxes directly into the central fiscus, but some allow a more decentralized approach. Examples are provided below from China, Indonesia, Papua New Guinea, and the Philippines.

China.
China levies two different royalty taxes, one of which is deposited solely with the national treasury for the fiscus. The second one, called the mineral resources compensation fee (Regulations for the Collection and Administration of the Mineral Resources Compensation Fee, N.150. 1994), is collected by the appropriate level of county, provincial, or city government, with 50 percent of the amount collected remitted to the central government and 50 percent retained by the provinces and cities. In autonomous regions the split is 40 percent to the central government and 60 percent to the region.

Indonesia.
Over the past decade Indonesia has embarked on a major effort to decentralize tax authority. This effort has also affected fiscal revenues derived from the mineral sector. Under current law, State receipts from natural resources, including mining, are distributed in the ratio of 20 percent to the central government and 80 percent to the region. The latter is split as 64 percent to the regencies and 16 percent to the provincial government.

Papua New Guinea.
In Papua New Guinea the government levies royalty taxes under its mining Act (Mining Act 1992). Provisions in the Act dictate that owners of private land receive 20 percent of the total royalty paid for mining leases on the land. In practice, the amount payable to landowners can exceed 20 percent, such as the OK Tedi and Lihir mines, which pay 50 percent. Mining companies pay the landowners directly and pay the balance to the State, which expedites and ensures payments to landowners, subject to the State checking and endorsing the landowners' share for correctness.

Philippines.
In the Philippines, by statute, local government units receive a 40 percent share of the gross collection from excise taxes on mineral products, that is, royalties, from mines in their territorial jurisdiction (The National Internal Revenue Code of the Philippines). This amount is distributed as follows: 20 percent to the province; 45 percent to the component city and municipality; and 35 percent to the barangay (village or district).

(3) Latin America

In Latin America some nations collect royalty centrally, with the amounts going to the general revenue fund for expenditure through the regular budgeting process. However, several major mining countries provide for the royalty to be distributed to a variety of entities identified in the law. In Argentina, individual States are empowered to levy and collect royalty and to determine how it is to be expended. In Peru, royalty is collected by the national tax authority, and the amount collected is then distributed to

statutorily defined parties according to specified percentages. In Brazil, the royalty law also provides that a variety of parties are to be paid statutorily defined percentages of the royalty, and most of these parties are paid directly by the miner. Inherent in any system in which payments go to the central tax authority for later distribution is the risk of a budget shortfall, so that payment to the other parties, even though set out in law, may be deferred or not made. This has been a recurring problem in some developing nations. Nations that allow entitled parties to be paid directly by the miner avoid this problem.

Argentina.
Argentina's constitution vests ownership of minerals to the province in which they occur. It also gives the congress the exclusive power to levy direct taxes but allows delegation of that power. The premise is that royalty is a compensation fee payable to the mineral owner, and thus the ability to levy and collect royalty is given to the provinces. The federal government has an interest in the promotion of national interests, so although the state governments have the power to set royalty rates and to collect and spend the royalty, this power has been limited through the mechanism of a federally imposed upper cap of 3 percent (Mining Investment Law). The result has been that some provinces have opted to levy the maximum rate of 3 percent, but others have decided not to impose a royalty. For example, in the case of Catamarca, a principal mining province, the royalty rate has been set at 3 percent. Of the amount collected by the province, 15 percent is for distribution to the municipalities where the mining project is located to finance public investment projects; the remaining 85 percent is used to finance provincial projects or public investments in other departments or municipalities.

Brazil.
In Brazil, taxation authority is set out in the constitution. It also stipulate that, with regard to mineral resources, the States, federal district, and municipalities, as well as the federal government, are assured a "share in the results" of mineral resource exploitation in their respective territory. In accordance with the constitution, statutory law provides that certain proportions of royalty are to be paid to lower levels of government and other parties. The distribution is defined as follows: 23 percent to the States and federal district, 65 percent to the municipalities, 2 percent to the national fund of scientific and technological development, and 10 percent to the mining and energy ministry, which shall give 2 percent of its share to environmental protection of the mining regions.

Peru.
In Peru, provincial and local community dissatisfaction with perceived non-participation in the benefits of mining led to political pressure that culminated in a royalty tax being imposed in 2004 (Law of Mining Royalty). The royalty is paid to the central government and then distributed as follows: 20 percent to the district municipalities where the exploitation takes place (50 percent of that goes to the communities where the mine is located); 20 percent to the provincial municipalities where the exploitation takes place; 40 percent to the district and provincial municipalities; 15 percent to the regional government; and 5 percent to the national universities of the region where the mine is located.

As is illustrated above, in some cases the affected communities share directly in royalty revenues. However, such examples remain the exception. It is more prevalent for communities to share in a property tax, that is, a levy based on the book or market value of a mine's capital assets, than to have access directly to royalty. But in more cases there is no direct tax link between mines and communities.

Annex 2.1

Summary of Royalty Practices in Selected Countries

	China	India	Papua New Guinea	Philippines	Botswana	Namibia	Australia (Western Australia)	Brazil	Argentina	Canada (British Columbia)	USA (Arizona)
Format	National law	National law	National law	National law	National law	National law	Provincial law or negotiated agreement act	National law	Provincial law	Provincial law	Provincial law
Royalty type (most non - Construction minerals)	Two types: 1. Royalty: unit based Plus 2. Mineral Resources compensation fee: ad Valorem based	Ad valorem or unit based	Ad valorem	Ad valorem	Ad valorem (NSR)	Ad valorem (sales revenue)	Mostly ad valorem or unit based, and profit based or hybrid for Diamond and V	Ad valorem	Most provinces: no royalty; others ad valorem	Profit based (net revenue) and ad valorem (net proceeds)	Ad valorem
Royalty rate	1: Various ranges for each mineral expressed in yuan/tonne ore, plus2: 1–4% depending or mineral	0.4–20.0%	2.00%	2.00%	3–10%	5–10%	2.5–7.5% ad valorem	0.2–3.0%	0–3%	13% (of net revenue) or 2% (of net proceeds)	At least 2%, commissioner To determine rate

	China	India	Papua New Guinea	Philippines	Botswana	Namibia	Australia (Western Australia)	Brazil	Argentina	Canada (British Columbia)	USA (Arizona)
Variation: Minerals	Yes 1: Ranges of unit charges for each mineral, plus 2: ad valorem rate for each mineral	Yes Ad valorem rate or unit-based charge for each mineral	No	No Except coal	Yes Precious stones: 10%; precious metals: 5%; other minerals or mineral products: 3%	Yes Uncut pre-cious stones: 10% of market value; dimension stone: 5% of market value; other minerals: max. 5 % of market value	Yes[c] Metallic: metal 2%; concentrates 5%; ore 7%, depending on degree of processing; industrial minerals: generally $A 0.30–0.50/t	Yes 1: Aluminum ore, mangan-ese, salt, phosphorus: 3%; 2: iron, fertilizer, coal, and remaining minerals: 2% (except for 3); 3: precious stones, diamonds, and noble metals: 0.2%; 4: gold: 1%	No	No	Yes
Copper	2% ad valorem plus 0.4–30.0 yuan/tonne ore	3.2% ad valorem - metal of LME value of copper in ore	2% NSR	2% ad valorem on market value	3% ad valorem on adjusted gross market value	5% ad valorem, on market value	Concentrate: 5% of royalty value; metal: 2.5% of royalty value	2% ad valorem on sales value less commercial taxes, transportation and insurance	Catamarca: 3% ad valorem on sales value less allowable deductions	More than 13% of net revenue less 2% of net proceeds, or 2% of net proceeds	At least 2% of market price
Gold	4% ad valorem plus 0.4 to 30 yuan/t ore	1.5% ad valorem; London Bullion Market Association price of gold in ore	2% realized FOB	2% ad valorem on market value	5% ad valorem on adjusted gross market value	5% ad valorem, on market value	2.5% of invoice value minus deductions such as transport value	1% ad valorem on sales value less commercial taxes, transportation, and insurance	Catamarca: 3% ad valorem on sales value less allowable deductions	More than 13% of net revenue less 2% of net proceeds, or 2% of net proceeds	At least 2% of market price

	China	India	Papua New Guinea	Philippines	Botswana	Namibia	Australia (Western Australia)	Brazil	Argentina	Canada (British Columbia)	USA (Arizona)
Limestone	2% ad valorem plus 0.5–20.0 yuan/t or yuan/m^3 ore	55 rupees/t	2%	2% ad valorem on market value	3% ad valorem on adjusted gross market value	5% ad valorem, on market value	$A 0.30/t	2% ad valorem on sales value less commercial taxes, transportation and insurance	Catamarca: 3% ad valorem on sales value less allowable deductions	> of 13.0% of net revenue less 2% of net proceeds, or 2% of net proceeds	At least 2% of market price
Coal	1% ad valorem plus 0.3–5.0 yuan/t	65 to 250 rupees/t	2%	10 pesos/t	5% ad valorem on adjusted gross market value	Up to 5% ad valorem, on market value	7.5% of value if exported	Yes - sales by Garempeiros is exempt	Catamarca: No	More than 13% of net revenue less 2% of net proceeds, or 2% of net proceeds	At least 2% of market price
Variation: Mine size	Yes Unit-based royalties set mine-by-mine	No	No	Yes Special treatment of small scale operations	No	No	No	No	Catamarca: No	No	Yes Commissioner to set rate
Deferment /Reduction	Yes	No	No	No	Yes	Yes	Yes			No But losses can be carried forward	No

Annex 3.

Summary of Statistical Assessment of Mine Impacts in Koenjhar

The Study Area

The study was based in the Keonjhar district. Mining for iron ore began in the 1950s in the Joda-Badabil mining belt in Joda block and some of the planned new mines fall in this district. Two blocks were selected in Keonjhar district: Joda block, with a high concentration of mines, and Keonjhar Sadar block, which is likely to be mined in the near future. All the sample villages fall within the "Peripheral Development Zone" of 50 km from the mining area and were selected systematically to ensure sufficient variation and representation of different social groups, especially scheduled castes and tribes. The sample includes 600 households and combines information from household and community surveys, spatial data on land cover, location of mines and villages, and census data. The study area contains clusters of intensive mining activities of different size, status and management practices and was specifically chosen because of the presumed magnitude of problems.[10]

Pathways and Impacts

The impact of mining on development outcomes is complex and multidimensional. Mining activities provide direct employment and indirect benefits through the economic activity stimulated by the industry. The presence of a mine may also deliver benefits through the creation of infrastructure and public goods such as roads, schools and hospitals. Offsetting these are potential negative impacts: pollution from mines, if not properly managed, could adversely affect health, which in turn may influence school attendance, worker productivity and employability. Mining in forested regions both directly reduces forest cover in areas of active mining and, without mitigation measures in place, indirectly affects the quantity and quality of forests through pollution and potentially through changes in the local economy (e.g., migration, increased demand for fuelwood). The ultimate impact is determined by the balance between the beneficial and the negative effects.

As a first step in identifying mine impacts, an array of "bivariate tests" are reported to identify possible links between mine exposure and a variety of welfare outcomes. The tests assess whether welfare outcomes vary with mine exposure and provide preliminary evidence of the possible pathways and impacts. Table A3.1 reports tests of differences in means over four types of welfare indicators: total cash income, ownership of physical assets (productive assets and land owned), human capital (as measured by health and education) and living conditions (defined by the structure of the home dwelling).

Villages in Joda (by design) are significantly closer to mines and belong to the "high" exposure category, while those in Keonjhar Sadar are in the "low" mine exposure group. The table shows that households in Keonjhar Sadar earn average cash incomes of Rs. 25,305, while those in the high mine exposure Joda belt have a mean income of Rs. 21,623. This difference of Rs. 3,982 is statistically significant. Households in Keonjhar Sadar are also significantly better off in terms of ownership of productive assets. Education levels too are higher for households in Keonjhar Sadar. Households in Joda report higher incidences of

[10] The approach used to assess mining impacts draws on conventional statistical methods, hence the usual caveats apply: First, a statistically significant correlation between variables does not imply causation, but when supported by other evidence (e.g. case studies and macroeconomic evidence) it is suggestive of a possible causal link. Second, the results are based on surveys drawn from two areas, so it would be premature to generalize the conclusions to other mining districts. Impacts will depend upon the spatial configurations of mines, demographic pressures, the assimilative capacity of the environment and the economic characteristics of these regions.

family illness. Separating the sources of income, wage income for households in Joda is higher than Keonjhar Sadar, most likely because of the employment benefits of nearby mines. However, the difference is not statistically significant.

Table A3.1: Descriptive Statistics of Welfare Variables

Variable	Joda (300 households)		Keonjhar (300 households)		Correlation of weighted mean with distance to mines
	Mean	SD	Mean	SD	
Total cash income†	21623	14408	25305	26890	0.110*
Days ill†	37.7	35.6	25.5	26.2	-0.159*
Adult education†	20.0	28.7	33.1	33.0	0.193*
Better quality of life†	0.8	0.4	0.9	0.3	0.136*
Poor quality of house	0.8	0.4	0.8	0.4	-0.016
Livestock asset†	1.5	2.1	3.1	2.7	0.302*
Production asset†	1.9	0.8	2.9	1.2	0.431*
Consumption asset	4.6	3.4	4.4	3.0	-0.006
Land owned†	0.9	2.3	1.6	2.9	0.134*

†

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