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Impact of Mining on Elephants of Chhotanagpur Plateau, Central India

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Introduction

The Central Indian landscape sweeps across the Satpura Hills of the Vindhyachal mountain range to merge with the Eastern Ghats and is straddled by the Indo-Gangetic plains in the north and Mahanadi Basin in the south. The Chhotanagpur Plateau, spreads over 30,000 km^2 of this hilly to undulating landscape, covering 13 districts across three states: Odisha (erstwhile Orissa), Jharkhand, and parts of West Bengal (Fig. 1). Almost 9000 km^2 of the plateau are covered by forest. At least 25 different tribal communities and an amazing diversity of wildlife including Asian elephants (*Elephas maximus*) thrive in the area. Beginning from its terminal point at Kapilash Sanctuary in Dhenkanal District in Odisha, almost contiguous forest continues to the north across the state boundary into West Singbhum District and then to Dalma Wildlife Sanctuary in East Singbhum District of Jharkhand. This vast forest is an important elephant habitat. However, underneath the forest cover occurs a great wealth of minerals.

India is the third biggest exporter of iron ore, after Brazil and Australia with most Indian exports being to China. Against India's reserve of 25 billion tons of iron ore, China has 200 billion tons treated as 'strategic resource reserves'. China Iron and Steel Association, the most powerful steel lobby of the country has recommended: "Like oil reserves, China should also have iron ore reserves. Large amounts of ore can be bought when prices are relatively cheap to guard against a monopoly from global mining companies" (China News 2010).

Chhotanagapur plateau is the country's biggest repository of iron and chromite ore with 90% of the global reserve of chromite ore being found in Odisha. Out of the total national reserve of iron ore, more than 61% occurs under the forests of Chhotanagpur plateau, distributed within the state boundaries of Jharkhand and Odisha (Ministry of Mines 2010). Initially, to take care of "imperial needs" of the British colonists and subsequently to keep in step with globalisation initiatives by free India, the plateau was exposed to exploitation for almost a century and a half. Beginning from the mid-nineteenth century, resources from these forests have been exploited for industrial activities. However, the magnitude and methods significantly differed from the present.

The first iron ore mine in the country was set-up by Bengal Iron and Steel Company Limited in Chiria and Duia in Saranda, both in West Singbhum District of Jharkhand in 1902. One of these mines pursuing an out-dated 'hand mining' method, which is a highly sustainable practice now discarded by others in preference of mechanised mining that produces more with less 'unskilled' manpower, is still functional and has provided employment to local tribal inhabitants for more than a hundred years.

Beginning in 1991, India started to dismantle trade barriers that had been in place since independence in 1947, ushering in an era of liberalised trade and economic growth. Such neo-liberal initiatives allowed easy access to natural resources by exploitive industries even within sensitive habitats that are home to forest dwelling people and wild animals. Due to an unprecedented swell in demand, the Indian government altered the National Mineral Policy in 1993. This encouraged private investment in exploration and mining of several strategically important natural resources, including iron ore, reserved until then exclusively for the government

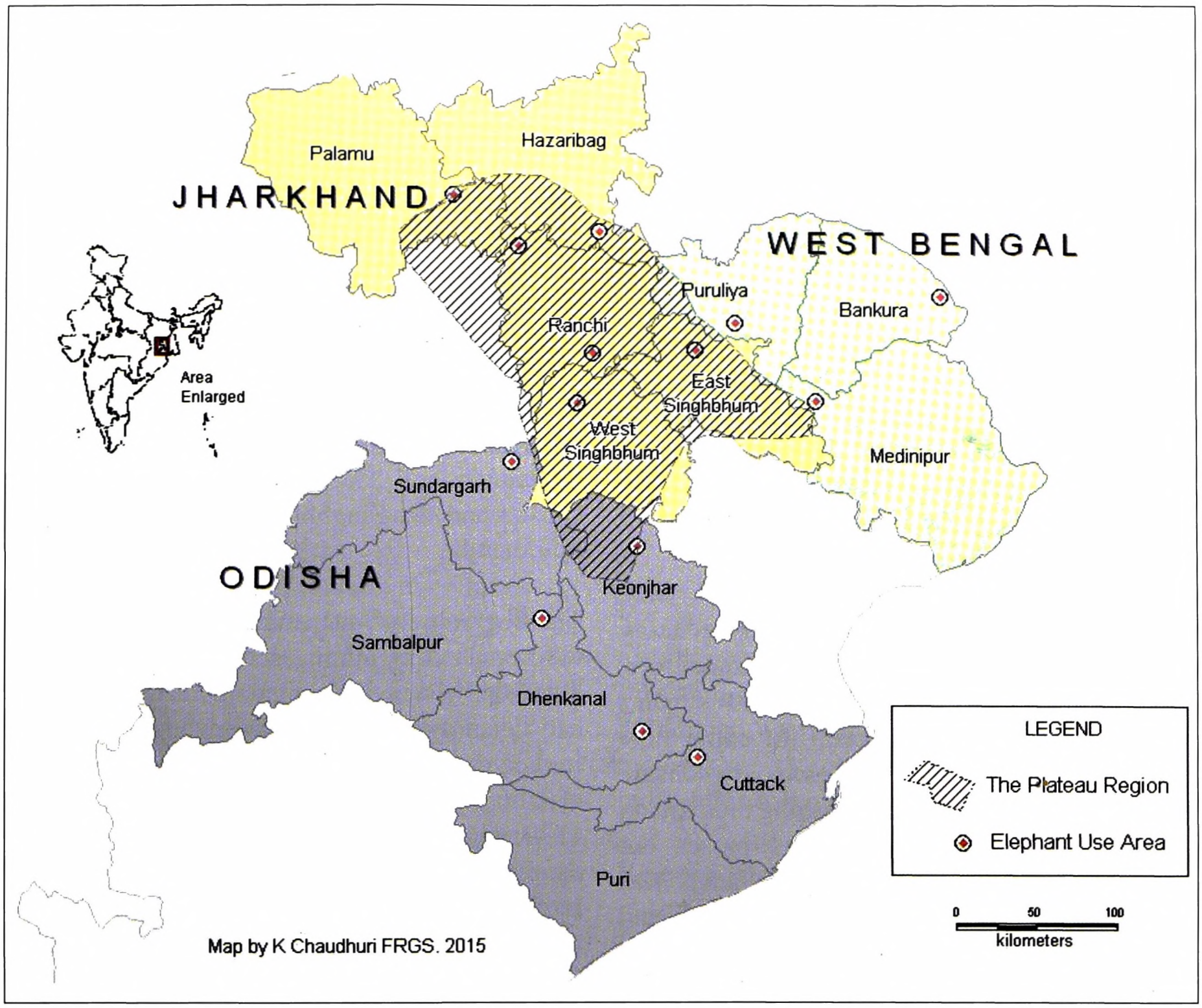

Figure 1. Map of the Chhotanagpur Plateau in the Odisha-Jharkhand elephant landscape.

sector and steel makers. In the present changed circumstances, the norms framed by the Indian Bureau of Mines (IBM), the regulating agency for mining operations, are observed more in the breach. The prospect of making enormous profits resulted in unsustainable growth and encouraged the proliferation of illegal mines. The margin of profit to be made by the traders was incredible. The cost of extraction and transportation to export points ranged between $ 6.25 - 8.12 per ton in 2007, against the prevailing selling price of around $ 100 per ton (in 2007 conversion rate). At the 56th meeting of the National Development Council in New Delhi, chaired by the Prime Minister, the Chief Minister of Odisha drew the attention of the council to the 'supernormal profits' being enjoyed by the mining companies operating in his state. He informed that the profits by mining operators exceeded even the annual budget of Odisha.

Impact of mining

In the last two decades 'strip mining' or open cast mines for iron ore has been initiated in Keonjhar District of Odisha and West Singbhum District of Jharkhand. Taking advantage of Section 2 of the Forest Conservation Act, vast stretches of Reserve Forests have been de-notified for non-forestry purposes like setting up industries and environmentally unsustainable opencast mines.

An example cited below indicates recent changes in land-use of two forest ranges of Odisha plateau; Joda and Keonjhar Sadar (Table 1). Since 1991, when unrestricted mining was permitted, mining activities extended over 1200 ha and the forest area decreased by 17,000 ha. It also shows the trend of decrease in agricultural land and increase in settlements that indicate settlement by outsiders in places vacated by original farmers.

Table 1. Changes in land use in two mining blocks of Odisha (Sadar and Joda Ranges) (World Bank 2006).

Land use	Area (ha)		Change in
	1989	2004	15 years
Settlements	4,288	5,287	+ 999
Agriculture	58,411	56,873	- 1,538
Forest	49,031	32,078	- 16,953
Wasteland	12,472	24,281	+11,809
Mining	2,402	3,585	+1,183

During the period 2001 to 2009 64,000 ha and 11,000 ha of prime elephant use areas were leased out for mining in the Keonjhar highlands of Odisha and Singbhum of Jharkhand, respectively (Fig. 2).

Thus, 75,000 ha of mostly woodlands were stripped of vegetation. An enormous quantity of water is required for washing of mined ore, which is procured by confining hill streams in reservoirs. In the dry season the entire flow is retained within the reservoirs to ensure uninterrupted supply for ore washing thus drying of downstream flows. Water that passes out from the washings remains heavily laden with sediment and becomes unfit for consumption and is released into spill channels. As a result of the mining, natural drainage patterns were altered and most perennial water bodies dried up and indigenous people were evicted. Additionally, activities peripheral to actual mining, like the operation of crushing plants, transportation of ore by road through vulnerable forest patches, and blasting day and night for recovery of mineral, generating deafening sounds exceeding >180 db at 150 meters, increased. During the peak demand period of 2006-2011, 18,000 ore-laden trucks passed through National Highway 215 that connects the mining belt in Joda Block with the seaport of Paradip, causing permanent closure of elephant transit (movement) paths through Sidhamath and Thakurani Reserve Forests in Odisha and the Singbhum Elephant Reserve in Jharkhand.

The beginning of intensive mining in Keonjhar, the heartland of mining activities, resulted in a dramatic twist in the human-elephant conflict that had taken a turn towards the worse previously. In the years between 2001 and 2006, the number of village houses damaged by elephants was 1739, while from 2006 to 2010, 511 houses were damaged, showing a dramatic decline. Similarly, trampling damage to crop areas by elephants reduced from 2845 to 1677 acres during the same period. Such reduction in conflicts was probably

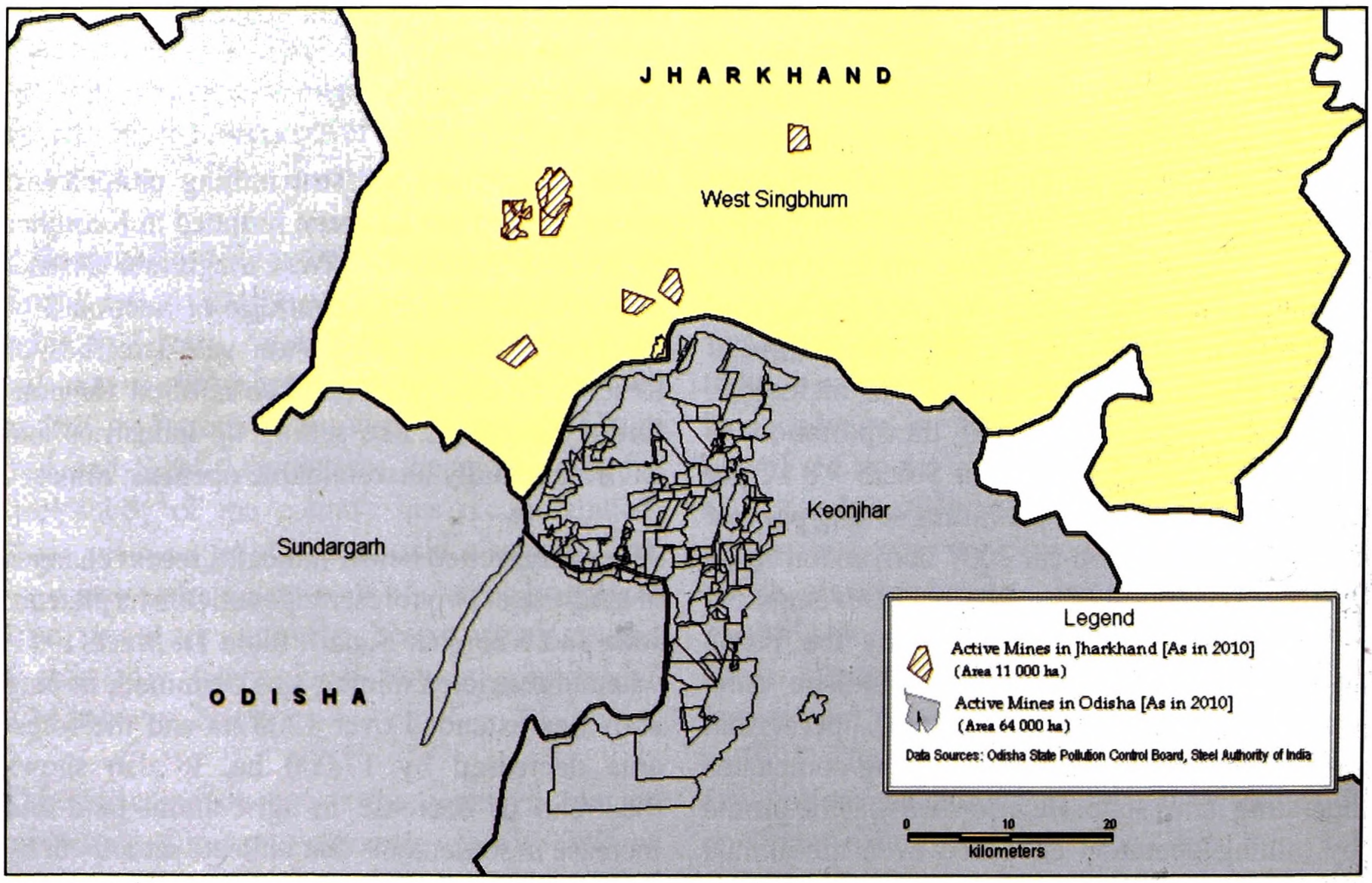

Figure 2. Locations of mining leases in Odisha and Jharkhand.

caused by a decline in the number of elephants in the forests where intensive mining activities were continuing (Source: Keonjhar Forest Division Records).

Interestingly, the decrease in elephant depredation in Keonjhar was closely followed by an increase in the neighbouring Dhenkanal District. In newly accessed locations by elephants, 67% of elephant deaths occurred in the 2005-2010 period, against 33% in the 2000-2005 period. Similarly, damage to crop areas increased from 1892 to 3802 acres in this period (Source: Dhenkanal Forest Division Records).

Mining leases in Odisha are grouped in close clusters where lease boundaries of neighbouring mines almost overlap each other. Such compactness does not leave space for elephant transit between the Keonjhar highlands and Singbhum in Jharkhand. Fortunately in Jharkhand the mines are spaced out over a very large geographical area, leaving vast stretches of closed canopy forests in between. Relatively fewer disturbances in the jungles of Singbhum are an encouraging experience. However, with a long list of pending mining applications with the Ministry of Environment, the scenario will surely worsen. New projects are in the pipeline in East Singbhum (Patka), Seraikella-Kharswan, West Singbhum (Karampada and Manoharpur). These proposed iron ore mines will eliminate more than 5000 ha of forestland and are being resisted by the local tribal communities, on occasions violently.

On the other side of the mining block, in Singbhum of Jharkhand, the virtual closure of elephant transit paths into Odisha and the denial of access to the Dalma Wildlife Sanctuary due to the recent completion of the Subarnorekha Multipurpose Canal in the north created at least one new elephant population with 24-40 individuals of mixed age and sex composition. This population has established a home range in the degraded forests of West and East Singbhum Districts (Chaudhuri 2011). Considering the recent rise in human-elephant conflict in densely populated Khunti and urban areas of Ranchi, the likelihood of this group's involvement cannot be ruled out.

Specifics defined by the Indian Bureau of Mines categorically state: "It (the Mine Closure and Completion Plan) must aim at leaving the area in such a way that rehabilitation does not become a burden to the society after mining operation is over." However, in utter disregard of stipulations, several mines remain as they were, well after the expiry of 'life' when a certain depth is reached, and cause the disruption of elephant transit paths. So even after 'closure', harmful impacts of such mines continue. Ironically, many abandoned pits of even 100 m depth are still retained by mine lessees as 'sites for future exploitation', hence they do not come under the purview of 'Mine Closure Plans'.

Signs of environmental violence born out of the compulsion to retain user rights of natural resources are already seen in most parts of India. It is time that sustainable mining practices are introduced, especially when almost all mining regions are scattered over forest tracts that sustain indigenous tribes and wildlife.

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Elephants in Corbett National Park (India)
Photo by A. Christy Williams