Women’s participation in the mining economy has significantly diminished in recent years with the advent of mechanized technology. In the case of India, however, women miners are still concentrated in large numbers, employed at rudimentary, labour-intensive, small and surface bound operations. Using extensive fieldwork conducted over the course of a decade, this chapter examines the gender roles and associated issues in informal mines, with a focus on the pathar khadans (stone quarries) in the Rajmahal region of eastern India. As the Government of India regards “stone” or basalt as a minor mineral, it provides little official data on mining of this type or about its labour structure.

SCOPE

Mining has played an important role in the development of human societies and economies. It is an activity in which humans interface with the environment and development in complex and intertwining ways. In the past, the discovery of minerals, such as gold and silver, resulted in population shifts and economic growth in the New World. The extraction of minerals, gems and coal continues to provide a foundation for local economies in many parts of the world. In most places, local communities are involved in extraction processes, although mining is notorious for bringing unforeseen changes to a region’s social fabric. However, when local communities participate in mining, does the mining economy reflect a shift in traditional gender roles, or are new identities formed and negotiated? Moreover, where are women involved in this sort of mining?

From a technical point of view, there are two basic types of mining and quarrying: surface and underground. In an underground operation, the participation of women workers is essentially restricted by international regulations that
came into effect in the last century; thus, women tend to seek employment at surface operations. Quarrying is a form of mining distinguished by the fact that the excavated product is used for building or architectural purposes, rather than subjected to further processing, as in the case of an extraction of a metalliferous component of a rock, or the combustion of coal to obtain energy. Stone, such as marble, granite, limestone and sandstone, is quarried by splitting blocks of rock from a massive rock surface. The desired product can take the form of a dimension stone suitable as building blocks and tiles, or can be crushed for use as gravel or aggregate. In 1999, the gross world production of stones was in the range of 55 million tonnes (GDM, 2000), with the highest level of production recorded in China, followed by Italy, Germany, USA, Spain, Japan and India; these countries account for just over one half of global production. About 60% of quarried materials are considered useful or marketable.

India is the largest producer of dimensional stones (27% of world production), and is a major exporter of stone. The breakdown of stone production in India in 1998 was as follows: marble, 3.6 million tonnes; granite, five million tonnes; sandstone, 5.5 million tonnes; flaggy limestone, 2.1 million tonnes; and slate, three thousand tonnes. However, the informal nature of much of the quarrying activity in the developing world makes the reliability of these data questionable, particularly when the low profit levels of stones such as basalt are taken into account, which results in many transactions going unrecorded. Indian quarries are typically small operations that proliferate next to one another in a suitable geological location; they have large numbers of women workers (Chakravorty, 2001; Nandi, 1996; Aich, 1996), and are also renowned for having bonded and child labour (PRIA, 2001; Alfa, 1999).

As a background, it is perhaps useful to consider the scale of quarrying operations in the developing world, as well as their status in terms of formality or otherwise. From the point of view of the scale of operation, mining is commonly divided into two categories: large and small; the concept of scale is widely used in mining literature. However, such classification commonly obscures the unity or diversity across scales, giving rise to a false dichotomy. For example, many small quarries situated in close proximity to one another can cover an extensive area. A more accurate classificatory scheme, therefore, is level of formality (that is, informal and formal), which takes into consideration the economy of the mining operation, as well as the economic context in which it is placed. Against such classification, informal mining can be defined as the low-capital, labour-intensive extraction activity in developing countries in which local communities participate in significant proportions. Within such operations, the mining-community interface cannot be easily explained using exclusively assessments of geology and scale. There is a wide range of workers involved in informal mining, including traditional artisans, male wage workers, and women who participate either on their own or alongside their families and children (Carino, 2002; Burke, 1993). Although there are clearly many different types of labour performed at informal mines, the work typically undertaken by women frequently goes unnoticed and is little appreciated. Women tend to comprise an
“invisible workforce”, despite the fact that the jobs they perform are integral to the functionality of the industry.

SMALL AND INFORMAL MINES IN INDIA

How are small mines defined in India? The Government of India’s Mines and Minerals (Regulation and Development) Act or MMRD Act of 1957 divides all minerals into two categories: major, and minor or small. The Act denotes, “building stones, gravel, ordinary clay, ordinary sand other than sand used for prescribed purposes (used for refractory, ceramics, metallurgical, optical and stowing in coal mines purposes, manufacture of silvicrete cement, sodium silicate, pottery and glass purposes), boulder, shingle, chalcedony pebbles (used for ball mill purposes only), limeshell, kankar, and limestone used in kilns for manufacture of lime used as building material, brick earth, fuller’s earth, bentonite, road-metal, rehmatti, slate and shale used for building material, stone used for household utensils, marble, quartzite and sandstone when used for purposes of building or for making road-metal and household utensil and saltpeter” as India’s “minor” minerals. This list clearly shows Indian’s artisanal heritage of quarrying diverse minerals, and, at the same time, indirectly emphasizes the informal character of their exploitation. Sahu (1992, p. 3) described small mines as:

Those whose production, or excavation quantity is limited in tonnage and not very large, mostly manually operated and sometimes employing machines to small capacity. Such mining activities are usually confined to deposits which are shallow in depth and small in extent.

Occasionally, a large number of small operations may be found occupying a significantly large area. The case study presented here is of one such region in eastern India, where there is extensive production of stone from several small quarries covering a rather large area.

The salient features in Sahu’s definition are as follows: small production, labour intensiveness, the shallow nature of deposits, and low technology deployment. Interestingly, many so-called large collieries would qualify as “small”, especially if compared to the mines of other important coal producing nations. Approximately 85 minerals are exploited in India at about 4,000 working mines. Of these, approximately 1,000 can be considered large mechanized opencast or underground operations. The remainder are small or “Class B” sites. In India, it has been estimated that the small-scale sector accounts for only 8% of national mineral output, and employs only 18% of the country’s mine workforce (NISM, 1993, 1994). However, no data are available on production from informal mines, either on an individual or aggregate basis. Similarly, contributions from women miners, who, again, constitute a large segment of the workforce, are rarely mentioned in government documents. For example, the National Mineral Policy, 1993, states the following about small mines:

Small and isolated deposits of minerals are scattered all over the country. These often lend themselves to economic exploitation through
small-scale mining with modest demand on capital expenditure and short lead-time, they also provide employment opportunities for the local population. Efforts will be made to promote small-scale mining of small deposits in a scientific and efficient manner whilst safeguarding vital environmental and ecological imperatives. In grant of mineral concessions for small deposits in scheduled areas, preference shall be given to the scheduled tribes.

Details concerning the important functions of women in this type of mining are excluded from the Policy; in fact, details of workers and working conditions are not mentioned at all. Regardless of size, all mines in India fall under a plethora of government rules and regulations: the Mines and Minerals (Regulation and Development) (MMRD) Act, Mines Act, Forest Act, and Environment Act. With their mostly inadequate technology and problems of mobilizing financial resources, small mines suffer innumerable handicaps, which lead to major inefficiencies. Among these is the excess worker problem, which has led to a large-scale retrenchment of women labourers in recent years. The country’s small mines are typically associated with poorly-developed infrastructure; they are virtually nonexistent in the periphery of government vision. The immensity of the mining sector bureaucracy encourages informal, rather than formal, operations.

After describing the technology and work practices of the stone quarries of Rajmahal Traps, this chapter explores gender relations in Eastern India’s informal mining industry. The study presented in this chapter asks the question: how do these informal mines reflect mainstream gender relations? More specifically:

- What work do women perform in the industry, and by what means?
- What are the socio-economic conditions of female workers, and their perceptions of gender relations in the quarries?
- To what degree of exploitation are women subjected to in these mines?

The work presented in this chapter constitutes a decade of intensive fieldwork that involved soliciting inputs from local indigenous people, particularly women miners, village pradhans (chiefs), other important community representatives, local Non-Government Organization (NGO) employees, district administrators, quarry owners, and labour contractors.

1 According to a handbook on coal published by a local district administration, there are as many as 16 laws covering the entire gamut of India’s mining activities. Important environmental legislation relevant to mining include: The Water (Prevention and Control of Pollution) Act, 1974; The Air (Prevention and Control of Pollution) Act, 1981; The Forest (Conservation) Act, 1981; The Mines Act, Coal Mines Regulation and Circulars issued by the Director General of Mines Safety; The Environment (Protection) Act, 1986; and The Mines and Mineral Regulation and Development Act, which was amended in 1988, making it obligatory on the part of mine operators to implement environmental safeguards, including reclamation measures for mined land.
THE RAJMAHAL TRAPS: HOME OF BASALT STONES

The basaltic Rajmahal Traps are located in Eastern India, some 250 km north-west of Calcutta within the bordering area of the states of West Bengal and Bihar. They occupy an area of approximately 1,000 sq km, and are estimated to be 600 metres thick, and to contain 30 metres of inter-trappean sedimentary beds measuring between 10 and 20 flows of basalt with thicknesses varying from 15 to 91 metres (Pascoe, 1959; Fox, 1931; Krishnan, 1958). Within the fine-grained Rajmahal traps, a columnar structure has developed in many places due to prismatic jointing (Wadia, 1975), which has facilitated pathar khadans – basalt stone quarrying in the region. The stone is fine grained, dark coloured, clearly hard ringing under a hammer, and fracturing with sharp edges like flint. The stone quarries occur in an area of transitional landscape orientated in a north-south direction, between the Rajmahal Hills to the west, and the Ganga Plain to the east. In this approximately 2,000 sq km area, the geomorphology sequentially changes from depositional plains, to erosional plains, to highly eroded plains with residual hills, uplands and mesa-like hills; the changes in the physical and cultural landscape are rather dramatic in this short distance. Moreover, the hill zone extending north-south from Sahibganj to the Brahmani River is traversed by two local streams, the Gumani and Bansloi.

The area’s largest and most elongated block of hills occurs north of the Gumani, and averages 250 metres in height. Its highest points are Kochla Pahar, Chaugharia Pahar and Khuta Pahar. The second massive block extends from Basko Pahar to Chuparvita but at somewhat higher elevation. The third sizeable block is situated between the Gumani and the Bansloi at an elevation between 250 and 300 metres. The block between the Bansloi and the Brahmani is the fourth massive basaltic landmass.

Historically, the region’s terrain has played a major role in the development and distribution of settlements, further influenced in recent times by the stone quarrying industry. Incisions in streambeds reveal knicks that expose the underlying basaltic material; at these junctions, quarrying becomes a feasible undertaking. Today, the inter-fluvial promontories of the erosional plains are heavily mined. Initially, the quarrying of basalt occurred around Sahebganj town, which was in close proximity to the railways. However, over time, the industry expanded to Pakur, where the low mounds of Malpahari, Kulapahari and Rajgram have provided ample opportunity for vigorous quarrying.

TERRA NULLIUS? INDIGENOUS COMMUNITIES AND LAND OCCUPATION

The social history of the region partly explains how women of indigenous communities and quarrying have interacted. The Rajmahal region has been inhabited by adivasis or tribal peoples but the land was always desired by the mainstream Hindu populations.

Rajmahal region is part of the Damin-I-koh, the core of which is inhabited by indigenous groups. Since ancient times, the groups that have occupied the
region have depended on the natural resources provided by local dense jungles for their livelihoods. In all likelihood, the Pahariyas – both the Malers and Malpahariyas peoples – were the earliest occupants of the area; the Santhals are now its largest indigenous group (Kumar, 1986). The Malers were slash-and-burn cultivators, their material culture revolving around the forests, which provide a source of shelter, food and beverage; raw materials such as sabai grass, lac, silkworm, honey and bamboo; and a base for forest-dependent cultivation. The Malpahariyas have settled mainly in Dumka and Pakur, and have maintained a separate identity to the other indigenous groups of the region. They practice a *kura* type of cultivation shifting, whereby dry crops such as millet, maize and beans are harvested using manure as fertilizer. They also hunt with bows and arrows, and fish using basic traps and nets, as well as spears. They also rely on local forests to earn a subsidiary livelihood.

The Santhals descended to these lands towards the end of the eighteenth century, at which time, other cultivating Hindu castes were migrating from the plains to the uplands of Chotanagpur Plateau (Dutta-Majumdar, 1955). Famines added to their desire for additional land, and they soon moved onward to the Rajmahal Uplands. The *zamindars* (local landlords) of Bengal hired Santhals to clear up new land for agriculture. The cultivating Hindu castes pushed the Santhals to the upper parts of the hill slope, whilst the Santhals, in turn, pushed the Pahariyas to the hilltops.

In places where the valleys of the east-flowing rivers open up to the Ganga plain, *Ghatwali* (caretakers of the “ghats” or hills) kings had been posted during the medieval period as standing militia to protect the plains’ agriculturists from possible tribal invasions. Eventually, the government encouraged the Santhals to settle in the down-slope parts of the region, granting them land that was free of taxes and ordinary courses of law. By 1832, the colonial British government was trying to resettle the Pahariyas in a part of *Damin-I-Koh* to stop lowland *zamindars* from making inroads into the hills. However, they refused to vacate their upland locations. These fertile strips of land between the hills and the boundary were soon occupied by the Santhals (Hunter, 1868), who, with their strong tradition of group work in their hunting and food-gathering activities (Somers, 1977), were able to reclaim much of the jungle lands of Rajmahal region. This attribute of Santhal society would eventually enable their women to participate in quarrying activity in large numbers.

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Some had even become indentured labourers in the rubber plantations of Mauritius (Hunter, 1877). In 1820, a tract spanning nearly 480 km in circumference, comprising portions of Rajmahal, Godda, Dumka and the Pakur subdivisions, was marked to protect the interests of the Pahariyas and to prevent the encroachment of lowland zamindars of Bhagalpur (Kumar, 1986); the Santhals were welcomed in the valleys and slopes of the demarcated areas. Following the rebellion of 1855, when the normally-timid Santhals and Pahariyas burst against the oppression of the sahibs (white colonial administrators), dikus (outsiders) and bhatias alike, the Santhals’ land was returned, and adivasi lands were made non-transferable to non-tribal people (Somers, 1977).

However, there are major differences between titular and usufructuary control. By exerting usufructuary control, quarrying activities have begun on legally non-transferable adivasi lands. In many cases, the khadan malik or the quarry-owner persuades the adivasi landowner to part with his land under the false pretext that the quarry owner will improve its quality by removing restrictive stones. In return, owners are to receive a nominal sum per acre per year but the quarry-owners are only entitled to the surface rights of the land for a 10-year lease period without changing the configuration of the plot (Das, 1993). After economically-viable stones are exploited, the ruined land that is returned to tribal control is typically riddled with large hollows, overburden dumps and waste material. The law states that the lessee must provide compensation to the lessor in account payee cheques but since the adivasi lessor is often illiterate, the quarry owners take full advantage of the situation and get away without paying any compensation.

The adivasis have remained in the Rajmahal region, helping to develop its stone quarrying industry but only as poorly paid labourers with uncertain jobs and incomes. The expanding mineral extraction economy gradually introduced a kind of reluctance on their part to cultivate the lands that at one time, provided shelter and other important resources. The land was lost to them, as were the resources necessary for their survival; the adivasis thus became wage labourers on the very land that had once belonged to them. The dispossession of the adivasis meant that the land and its resources took on a different meaning – something that is to be exploited without any concern for the future – because it no longer belonged to those who had lived there for generations. Women, who, in adivasi societies, had a pride of place as workers and copartners in production, have taken on a much more insignificant role in the pathar khadan economy. More specifically, the new mining and quarrying economy has attributed a rather low status to women, using them as much as possible without due value for their labour.

STONE QUARRYING IN RAJMAHAL

Let us revisit the physical properties of Rajmahal Traps, or, in fact, its stones. The region’s basalts are bluish-green in colour, hard and heavy, and of porphyritic texture without any ash or zeolitic beds, and are available in abundance. During ancient times, basalt was used in the construction of the now-ruined city of Gaur. It was also used as a supplement in doorposts and lintels in certain temples and buildings of Rajmahal town. Whilst constructing the railway bridge over the
Ganga at Mokama in Bihar, stones were supposedly tested by the Eastern Railways and proved to be the best quality of all of Asia’s building and construction stones, largely because of their ability to withstand great pressures. This was the greatest impetus behind the large agglomeration of small stone quarrying operations or khadans in Rajmahal Traps – an occurrence unparalleled not only in eastern India but in the entire country.

The technologies used in these stone quarries are rudimentary, the only mechanized unit being the crusher. The physical conditions are also favourable for quarrying activity; low mounds underlined with good quality basalt are suitable surfaces for economic quarrying. In such topography, the amount of labour required to remove the overburden is minimal because of the proximity of hard rocks to the surface. Stone quarrying, a highly labour intensive activity, has benefited from the comparatively poor agricultural sector, and the availability of plentiful cheap indigenous local labour. The cost of labour is low, which enables high labour intensity. Many adivasis now undertake quarrying activity along with women as working partners; without the adivasi labour, the stone quarries would not have come into existence. Although women played an important role in assembling a necessary labour force, as we shall see, they have now ended up as subordinates to the khadan industry.

As per Regulation 106 of the Mineral, Mining Rules (MMR), 1961, the khadans are required to adhere to particular requirements. Most notably, rock walls must not exceed a slope beyond 60 degrees; the height of each bench should be restricted to six metres (Das, 1985); the roads within the khadans must be more than seven metres wide; and the slope of the road should be less than one in ten (Mukherjee, 1984). As in other forms of opencast mining, the removal and disposal of overburden requires vast quantities of land. However, as the processing of stones is almost always performed within the area acquired for the khadan, and the fact that the thin soils of upland Rajmahal do not support prosperous agriculture, the acquisition of large tracts of land for various activities (of the khadans) is not especially challenging.

The first quarry operators were very much in tune with the state of the minerals industry elsewhere in India at the time (Rothermund & Wadhwa, 1978), the-then Maharaja of Kashimbazaar and Maharani of Pakur investing the earnings of their zamindari estates. The colonial sahibs, however, initiated expansion of the industry. In 1870, an early entrepreneur, Atkinson, was attracted to the bluish-green compact basalt of Udhua nala (stream) situated close to the Ganga. Ambler followed him to set up his own unit in Maharajpur in 1877 (O’Malley, 1910). Initially, the waterways – more specifically, the accessibility to the Ganga – proved vital in the selection of quarrying sites. As a result, some good-quality basaltic deposits, located at a distance of 2–3 km from the river, could not be exploited. During summer, the stones were transported in carts from the quarry-site to the Ganga, whilst during the rainy season, the boats could enter the quarrying site directly through the nala or stream channel. Prior to the commencement of stone quarrying in Rajmahal, the Calcutta Municipal Corporation imported basalt. There are hardly any official data or accounts of quarrying from these time periods, and, apart from special circumstances,
government agencies took little interest in developing quarries. Government departments such as the Indian Railways and the Public Works Department were the major customers of the stone produced by these quarries. By the time the railways were expanding in this part of India, and the need to build bridges such as the Sara Bridge at Mokama was being felt (toward the last quarter of the nineteenth century), references to Pakur quarries were beginning to be made. Rare personal histories and memoirs provide more information from which one can draw a rough sketch of the historical growth of the quarrying industry. For example, after 1909, quarrying activity began to increase at Malpahari near Pakur, and was soon complimented by the investments of local landlords and royalty. From Malpahari, quarrying extended to Rajgram within Bengal, under the initiative of the Maharaja of Kashimbazaar. Between 1930 and 1950, a great expansion of small and medium sized quarries took place along the railway line north of Pakur up to Maharajpur.

Following the partition of India, Sindhi and Punjabi businessmen who had crossed the India-Pakistan border and had brought wealth in the forms of gold and cash, settled in Pakur to invest in stone quarries (Das, 1993). The building boom that followed independence provided the first impetus to the quarries at Malpahari, and in the area between Pakur and Maharajpur. Strangely, not much of this has been recorded in the Government of India's documents. Only the Census Report of 1961 provides an inventory of the number and locations of stone crushing units in different parts of the districts of Santhal Parganas and Birbhum. The later censuses completely ignored this industry, a period that coincided with the most rapid growth of the khadans. The growth of this unorganized industry continues unabated, and remains largely unrecorded and disorganized, although most miners operate legally under an individual licensed ownership scheme. Numerous small quarries also emerged outside of the principal clusters of Malpahari and Rajgram, supplying boulders and ballasts to the crushers based in close proximity to railway loading sites at Pakur. Many of these quarries were ephemeral operations and were quickly abandoned, although some survived, in spite of the diseconomy of the poor transportation system of bullock carts.

Since the 1960s, sizeable industry expansion has occurred in Barharwa, Taljhari, Bakudih, and Borio villages, in connection with the construction of the Farakka Barrage across the Ganga. From this time onward, quarries began shifting away from railway track locations, depending on available road transport. In fact, the three phases of growth of Rajmahal's stone quarries are broadly associated with three different locations: riverside (1870–1900), railside (1900–1960) and roadside (1960 onwards). The 1961 Census recorded 65 crushers in Santhal Parganas of Bihar, and four in Birbhum of West Bengal. In Santhal Parganas, 63% of crushers were located in Pakur. Presently, no less than 260 quarries operate in the region stretching from Rampurhat in the south, to Sakrigali in the north (straddling Bengal-Bihar border). More than 65% of these quarries are located in the district of Sahebganj alone. There is, however, no recorded data since 1961 that effectively illustrates the magnitude of the period of extensive growth experienced in the region that began at the time.
Whereas quarries are all worked by local indigenous peoples – both women and men – Sindhis, who hail from the province of Sind in Punjab, mainly control the ownership of the khadans. This ethno-cultural group is now domiciled in Pakur but typically maintains an insular existence. Other owners are non-locals as well, and include Punjabis, Marwaris and Biharis; these groups have other business interests in adjoining areas such as retail and wholesale trade, transport and manufacturing. Many Biharis are related to the Maharajas of Pakur or were involved in various services at the Raj estates. Over the last one hundred years, when the khadans began to flourish, the ownership pattern evolved to reflect the overall pattern of growth in the Indian mining scene.

Presently, the Sindhis own more than 80% of the quarries, whilst the remaining operations are owned by Marwari, Punjabi, Bihari and Bengalee entrepreneurs. The quarries have an elaborately hierarchical social composition in which the kamins or women adivasi labourers belong to the lowest rank, forming the weakest section in the entire khadan economy.

PRODUCTION IN KHADANS

What is the cumulative production from these quarries? The entire production of stones of the Rajmahal Trap quarries is destined for markets outside of the region. No official records exist but some informed guesses could be made from personal observations and the data for stone goods exported by the Railways. The Ward section of Pakur Railway station provides relatively reliable information regarding stones carried in railway wagons but these data do not include the produce handled by road transport. Within the region, the quarries of Malpahari contribute a rather high share – approximately 90% – of the total volume of stone traffic. Stones produced by the crushers at Nagarnobi, Kulapahari and the roadside quarries west of the Railway track contribute no more than 10% of national output. In the last 30–40 years, stone production has increased sharply, keeping pace with increased demands for urban housing and other infra-structural constructions. Even these Railway Ward data tend to underestimate the figures, as Railway wagons are often loaded beyond their 600 cu ft capacity. Loading is performed by quarry owners, in collaboration with corrupt railway staff, in order to minimize freight charges and to disguise production/sales figures.

In India, no agency keeps tabs on the road traffic movement, records pertinent data, or maintains authentic information on stone production. At the exit point, all trucks passing through Pakur must pay a road tax that is supposedly recorded in logbooks but these figures are, in fact, more manipulated than those provided by the Quarry Owners’ Association. However, quarry owners are inclined to keep the temporal increase of their production data a secret to avoid paying income tax.

Around Rajmahal, local consumption of stones is minimal. The railway data put total rail export at 52,894,200 cu ft but from personal observation, a more accurate – yet, conservative – estimate can be made based upon the number of trucks carrying stone goods in the Rajmahal Traps region. This road export may
be taken as the equivalent of 250 trucks carrying loads of 300 cu ft for 300 days, (the monsoons having a few slack days), which amounts to 22,500,000 cu ft. Assuming a manipulation of the freight records to be about 100 cu ft per every 600 cu ft, the total annual production figure is in the range of 88 million cu ft or more than three million tonnes, based on informed guesswork. If these quantities are taken as saleable product, with a waste stream of 40%, the gross production of the Rajmahal region amounts to some five million tonnes, which is not consistent with the production data provided earlier. Indeed, basalt is not identified as a separate item in Indian stone data, and here, we are only dealing with one quarrying region.

The general trend in transport over the last 15–20 years has been a gradual decrease in rail compared to road. This is due to the increased availability of trucks compared to railway wagons, and the fact that trucks can deliver stones to the point of demand, thereby eliminating intermediary stages of loading and unloading at break of bulk points. The cost of transporting stones by road is slightly higher; a wagon of stone from Pakur to Calcutta costs approximately Rs 3,000 (US$60) by rail, whereas about Rs 4,000 is required to transport the same quantity of freight to the same destination via road. Again, the average annual production data hardly provides an accurate picture, as there is a distinct seasonality involved in the production of stone. During the months of February—June, prior to the monsoon decline, production is at its highest. Khadans are almost always closed during the rains, with the exception of certain roadside quarries situated away from the congested Malpahari cluster. These units also hire more tribal workers than the others and actually increase their production during the rains. The lower parts of larger khadans are typically submerged with water during these times, and although pumps are used to drain shallower quarries, in deeper excavations, the depth of water logging can be as much as 15 metres, which can cause a stoppage of work altogether. Moreover, because construction work also slows during this time, the demands for mined product are less. Managing a quarry efficiently becomes near-impossible during the time of the monsoons.

Quarrying activity picks up again from November onward, peaking in February because of the harvest-related activities in agriculture. The uneven topography, combined with the inadequate rainfall of Rajmahal region does not permit a thriving agriculture but during times of peak harvesting and sowing, labourers who would otherwise work in quarries, revert back to their traditional occupation. The harvesting and planting seasons are also festive seasons for local indigenous groups (adivasis) and some local/converted Muslims. As people are required to spend more money during these periods of festivity, they try to supplement their poor incomes by working more hours during the April–May and December–January periods. There is no season-based wage incentive for laborers, as many are marginal farmers, sharecroppers and landless labourers, who represent attached labourers to land-owning households. The bulk of the quarrying labour force is therefore partially bonded agricultural labourers who find it hard to leave their villages during peak agricultural seasons lest they are required by their landowners in exigencies. Women workers are usually tied
to their family’s movement, working as part of a “family unit”. The labour contractors or the owners find the family labour system rather amenable to their needs: the payments are made to the family unit as a whole treating women as the equivalent of about half a man’s work. Children are also part of the family unit, and often follow their mothers in their work.

TECHNOLOGY AND ECONOMICS OF KHADANS

A rudimentary extractive industry, stone quarrying has several interesting technological and economic aspects that are worth exploring. Almost all of the work performed in the khadans is manual and hence the largest component of cost is the wage bill. In fact, the labour intensive character of the industry has made it an easy form of capital investment, capable of providing a high rate of return; this labour intensive character is typical of informal activity. The patriarchal nature of the mining economy has determined a low status for all women involved in khadan work, and has assigned them the heaviest, and most monotonous, of jobs with the least security and most risks. Without the hard work put in by women workers, many of the quarries would not operate. However, there is little recognition of the fact that women are exploited at every level, whether at home or at work.

The work in the quarries, although manual, is elaborate and may involve several stages, each completed distinctively by both men and women. Being entirely informal in nature, the quarrying industry does not offer any benefits related to these jobs; diseases like tuberculosis and asthma are common and cause early deaths. The adivasi labourers are not tied to any particular quarry and tend to move from one to another. The quarry-owners do not offer any medical facility, and the nearest hospital is many kilometres away.

During the early days of quarrying, an intensely heated iron pot, such as a cauldron, was placed on massive stones for blasting, after which, the rock was cooled with water. Repeated heating and cooling caused the development of cracks in the rock, which was later hammered into pieces; this process was entirely manual. Today, the actual task of dislodging the stones is undertaken by men, who blast the explosives drilled into the rock either manually with a hammer or using a drilling machine. In Santhali, the blasting operation is referred to as “hul”, meaning a stir or rebellion. Special caution is required for blasting the layer called “kekri”, because the stone splinters may scatter a great distance. Blasting with gunpowder has become obsolete, and today, mainly gelatin is ignited with electricity through a remote control device. The removal of the overburden is performed manually using pick-axes, spades and crowbars, and then dumped into adjacent vacant lands by adivasi women, who carry waste rock in their baskets and spades. The blasted and loose boulders are then separated from the rock wall manually using pickaxes, crowbars, hand drills and hammers. Men perform this job, although at the next stage, the cutting of sized-boulders and loading of boulders onto trucks are both predominantly performed by women. The boulders are then hauled from the khadans to the
crushing sites for further processing. Here, women usually unload boulders from the trucks. After quarrying, the stones are shaped into different sizes to suit the requirements of customers.

The largest stones, boulders, are used to reinforce riverbanks and canal banks, and used in embankments. Stone bricks were once used widely for road construction and for paving tram tracks in Calcutta. With the advent of concrete, they have since become nearly obsolete. Chellies are intermediate products that require further processing before they can be used for various construction purposes. Chips are derived from crushed chellies, and ballast consists of pieces of stone meant for lining the railway tracks and for road building. Certain types of ballast used to be hand-made by women but that process is gradually changing. Chips are the ultimate finished product of the basalt stone quarrying industry. Processed into different sizes for different purposes, chips are used in concrete casting and in massive gravity structures like dams. Smaller chips are in the construction of residential houses, and the smallest chips are used in the casting of roof and floors. Transport from the crusher to chip dumps is an activity performed by conveyor belts. The by-products of khadans include stone dusts that are used for land filling, and low quality mortar used for temporary structures. The basalts are covered on the top by a red earth, which is removed as overburden. This earth, when granular, is locally called “morrum”, and is used in road construction because water can percolate through it swiftly. Gravels are by-products of inter-trappean beds, and are used for road building and lining river and canal banks. In the entire stone quarrying industry, crushers are the only mechanized units.

Mechanization of the operational processes in stone quarrying in the Rajmahal Traps region has remained low because of the inexpensiveness of labour and the lack of enforcement by the government of any labour rules and laws. Women workers bear a huge burden of this largely manual work at insignificant pay levels. As safety rules are non-existent, accidental deaths are usually not compensated for, and it remains up to the individual to take the necessary precautions for personal safety. A philosophy of “looking after the weaker sex” pervades the mines. Women are excluded from explosive usage and forbidden from using machines such as crushers when they are present. They are assigned mainly transport duties; they move head loads of baskets with masses as much as 50 kg. Local trucks carrying boulders from the khadans to the crushing site do much of the on-site transport jobs. For this purpose, temporary labourers are employed through thikadars or labour contractors. Women workers dominate the on-site truck transportation, as these jobs are even more uncertain than those in the khadans. Off-site transport costs are borne by the purchasers.

The cost of production varies from firm to firm, depending on their size, the quality of rocks, and the availability of labour. In Pakur quarries, a seasonal variation occurs during the rains as additional charges are levied for pumping rainwater that has accumulated in the khadans. The running costs of a quarry include wages for labour, electricity and royalty, whereas the investments made for infrastructure, management and machinery like crushers, compressors,
generators and buildings are regarded as fixed costs. The cost of production also varies from product-to-product because they involve different sets of jobs and different rates of payments. An amount of 100 cu ft of stone chips requires about 150 cu ft of boulders to be crushed. Wage payments are made in three ways: piece rates, fixed daily rates, and contractual rates. In reality, labourers are paid mainly on a contractual basis for operations like blasting, drilling, truck loading and unloading. The crushing of stone chips from chelly generates about 40 cu ft of stone dust for every 100 cu ft of product. This dust is carried away at the rate of 10 paise per tukri or basket. The wages of machine cleaners, greasers, tickli (token)-distributors and water carriers are paid fixed daily rates that are low by even Indian standards, not exceeding Rs 1 per 100 cu ft of chips produced. However, the proportion of these costs varies according to the scale of production, rising in smaller firms and diminishing slightly in larger ones. The salaries of managerial and supervisory staff are usually higher but are also paid fixed rates. Their total ratio comes to about Rs 30 per cu ft of stone chips. The cost of electricity to produce 100 cu ft of stone chips is approximately Rs 10. The amount of royalty paid by the quarry owners is fixed at the rate of 80% of the pit-head value of stone. In Pakur, the pit-head value of 100 cu ft of stone is about Rs 45, leaving an end sum of only Rs 36. Fixed costs are as follows: Rs 200,000 for a crusher; Rs 50,000 for a compressor drilling machine; and Rs 50,000 for the construction of a small shed.

Coming back to the work performed by women labourers in the khadans, we can sum up the observations as follows. Work is undoubtedly tedious and extremely labour-intensive, with little intrusion of capital or technology. If technology, such as crushers or explosives, is used, then these job areas immediately become male prerogatives; women perform all of the heavier burdensome jobs of transporting using head loads of baskets, and sorting stones according to size. They are pushed into types of work within khadans that are more uncertain or less secure. The quarrying economy of the khadans of Rajmahal is therefore not gender neutral. Despite a lack of mechanization and the informality of khadan work, women workers are still relegated to a lower level of production, performing tasks that are burdensome jobs and which are associated with great risks.

The next section of the chapter examines the physical and social changes that have been brought about by the stone quarrying industry. An effort is made to show how these changes have made it even more difficult for the women inhabiting poorer communities to survive.

**Kamins in Khadans**

As noted, women workers are invaluable to the stone quarrying industry of Rajmahal Trap region. They are commonly referred to as “kamin”, a feminine equivalent of the term “coolie”. Kamins used to be common in Indian collieries and other mines (Roy Chaudhury, 1996), constituting some 40% of the total workers in khadans of various capacity, although this figure is based on informed
guesswork. Today, there are approximately 40,000 labourers – both male and female – working in the entire region, including Bengal and Bihar; they comprise the adivasi communities and Muslim groups migrated from the nearby Murshidabad district. Local semi-adivasi groups such as bauri, bhumij and kurmi also work regularly in the khadans. This total figure refers to only those who work here on more or less a regular basis, or who have come through various labour contractors or thikadars. Besides these, there are also those who work in khadans as temporary workers for trucking companies. Workers usually come from an area of approximately 20 km around the khadan zone. The women workers came into quarrying work along with their families, and are often treated as a single unit with their male counterparts. Women also come with children of all ages, who often work in the khadans with their mothers.

The system of recruitment in khadans is interesting, and is usually the same for both male and female workers. Originally, there were two systems: zamindari and nokran (service tenancy). Under these systems, the zamindars owning khadans would offer agricultural plots to workers on the condition that they would also work in quarries. It was clearly a semi-feudal arrangement with an industrial variation established to ensure a steady flow of labour. At the same time, it provided a degree of freedom to the quarry workers. This zamindari system of recruitment gradually changed, because of the lack of arable land around the quarries and the stronger attachment of labour to the land than the khadan. This, again, created a problem of unsure labour supply. Owners’ concern over this uncertain labour supply situation resembles that in Indian collieries; in 1920, Mr Burt of the Coalfields Committee lamented:

All our efforts should be directed towards obliterating all agricultural ideas out of the miners’ heads. It is miners we want, until we have a mining class, our product chart will be like the peaks of the Himalayas. (Quoted in Roy Chaudhury, 1996).

Hence, an alternative system of recruitment had evolved based on contract, through contractors or thikadars solely responsible for the regular supply of workers in the quarries. Once brought to the khadans, the workers are paid by the quarry-owners; some thikas are offered payment on a per capita or commission basis. The agents of thikadars managed a sizeable supply of male and female labourers to the khadans through the payments of advance donations for local rituals, or the granting of various allowances. However, in recent years, there have been many incidences of voluntary employment of local adivasis without the intermediation of a thikadar.

Both the labour and care of kamins were needed for the flourishing of the stone quarrying industry in Rajmahal. From the beginning, khadan owners were eager to employ women workers as they found kamins to be more suitable for the tiring and endless jobs of sorting and carrying head loads. The male labourer usually came with his wife and children to work in khadans. Both parents worked along with their children, rested, slept and ate together. In fact, the quarry owners encouraged the adivasis to bring their female partners to minimize costs and to ensure a certain supply of labour. The wage levels for women were
lower, and still are, in spite of their heavy manual workload. Initially, women were treated as part of family labour, and even when treated as a separate unit, the valuation of their labour was usually determined by quarry owners and labour contractors. *Kamins* remain important loaders in the *khadans*, working as partners to male cutters or as individual workers.

Although there are some nascent trade unions and activist groups working in the Rajmahal region, gender awareness has yet to grow among them. Living conditions close to the *khadans* are very poor. Dwellings have only one thatched room that acts as a kitchen-cum-bedroom, and lack toilet facilities. The heavy work, lack of medical facilities and poor living conditions are reflected in very high mortality rates and unsatisfactory health conditions among both women and men. However, women also bear the reproductive burden for their families, and are often the subjects of lust for local goons or leaders. Almost all *khadans* workers are illiterate and poor, which makes their exploitation all the more easier. Literacy rates are even lower among women. Often, *kamins* working individually are huddled together in tiny hutments, working hard to send their remittances to their villages to provide for the elderly in their families. Yet, it is clear that the patriarchal nature of Indian society has penetrated tribal values to ascribe a lower place for women. Stories of desertion and rape are not uncommon: Buti Mejhen of Pakur was raped several times by the *khadan* manager and when the news leaked, she was summarily thrown out of the *khadan* with the stamp of “immorality” put on her by her male colleagues. Her husband left her and took up another wife. Here, there is clearly a sense of solidarity, as males work more effectively than the class solidarity or ethnic camaraderie. In fact, *adivasi* communities in eastern India that never bothered much about a “woman’s character”, have changed in essentializing the values of mainstream society that go against the interests of women in quarries. Quarrying has led to a reversal of not only women’s roles and statuses, but has also altered the way *adivasi* families look at their women and their work.

The chaotic nature of the *khadans* and extremely poor living conditions make certain that women are forced to accompany their families and be treated as part of a family labour unit. Thus, women are trapped in a vicious circle of subsistence in the *khadan* economy. Widows or single women tend to stick to their family relatives, and cases of sexual harassment are common. As low wages and the hard manual nature of work encourage drunkenness and alcoholism among men, women become more tied to their children and become their primary carers. It is not uncommon to find a young *adivasi* mother carrying a head load of 35–40 kilograms on her head whilst a baby is tied to her back or lying under the shade of a ledge or, increasingly rarely, a tree. Children are also looked after by older family members but as soon as they are able to perform work, are employed in *khadans*. As workers in *khadans*, children often break stone into pieces with small hammers for their mothers who carry the load to the crushers. Dinu Soren of a village near Pakur wakes up before sunrise to clean her mud hut and to cook lunch for herself and her family of two children and an ageing father-in-law, tugs the children along to her work in the *khadan* some 10km away from her village to work the entire day with only a short
lunch break, and then goes back in the afternoon to complete her household chores such as feeding her goat, washing, and cleaning and preparing the family's food. Often, she has little or no food left at all after feeding her family, and she has to depend on panta or water-soaked leftover rice. Yet, Dinu's husband feels she is not working hard enough, and spending her time chatting to her manager. As this case shows, apart from family responsibilities, cultural barriers act as a major obstacle in pre-determining perceptions of women workers in quarries.

Kamins are generally considered by quarry supervisors to be more responsible than male workers. A quarry manager commented that women workers usually spend less time chatting to co-workers. They may take a break every now and then, to look after or to feed a baby, or to smoke a bidi (local tobacco leaf rolls), but usually one can get the most out of their labour. On the other hand, male workers may report to work drunk, and often drink in the absence of supervision. In addition to the family wage, women workers are also paid on a piece rate basis depending on the numbers of baskets they carry. However, it is interesting that women are the first to be sacked when it comes to the need for retrenchment; thus their jobs are more uncertain and insecure than their male counterparts. In khadans, women workers are treated as a dispensable group, although they are the ones who work the hardest and earn the least. This situation reflects an imitation of the prevailing attitudes towards women workers in formal mines, where their presence is virtually non-existent. Even when in the employ of a formal operator, they are the most invisible group to even the trade unions that are supposed to protect the interests of the “working class” as a whole.

The International Labour Organization, in its 1999 report, had noted (p. 34) the pitiful condition of women workers in small mines all over the world:

Because mining is often seen as “men’s work” it has influenced women’s attitudes to it and the attitude towards women of other groups, including male miners, government agencies, banks and NGOs. Women’s perceived inability to cope with much of the physical side of mining, superstition, implicitly extending bans on women working underground to other activities that are not prescribed, the fear that women’s presence might lead to “indiscipline”, and the general unsavoury atmosphere of much small-scale mining all affect their participation. Family responsibilities also restrict the time many women can devote to mining activity, reducing their productivity and earning capacity.

Unless greater gender sensitization occurs at all levels of the mining industry, there will be little change. Women workers will continue to be subjected to hard labour for minimal compensation and the chance of losing their occupations in the event of enhanced mechanization and formalization of khadans.

A recent result of large-scale expansion of quarrying in the Rajmahal region has been a rapid deterioration in the subsistence resources provided by the local ecosystem. This has had significant impact on the poor women of adivasi communities. Thus, abandoning the low-paying work in the khadans is no
longer an option because other sources of livelihood are rapidly deteriorating or vanishing. The next section of the chapter will briefly discuss this problem, and show how it directly impacts the lives of poor women.

PHYSICAL AND SOCIAL CHANGES AND WOMEN IN KHADANS

By nature, mining and quarrying activities leave a conspicuous footprint on the land. Their effects are physically visible in a concentrated location, and occasionally, the resulting alterations are inevitable as well. Stone quarrying leads to a dereliction of land, transforming it into a wasteland devoid of valuable resources, and a dangerous and unhealthy tract, in turn, rendering it useless for future development. There is no doubt that because of a lack of government control, the stone quarries of the Rajmahal Traps have had devastating effects on the regional physical environment. However, the less visible impacts have been social in character, having a great bearing especially on the survival of poor indigenous women living in the region. The extensive quarrying industry of Pakur has not only destroyed the physical and biological ecosystems of the region but has also altered the region’s entire social fabric. Derelict lands, huge quantities of airborne dust, abandoned pits, overburden dumps, waste dumps, devegetation, soil erosion and degradation, desiccation of springs, reductions in surface run-off, and encroachment upon agricultural lands are among the most significant the physical impacts of stone quarrying activity in Pakur (Das, 1993). A quarry owner may sometimes stop the work tentatively in one mine and move on to another that is determined to be more cost effective. Thus, within the khadan zone, there are both operational and abandoned khadans, resulting in the entire area appearing like a moonscape. As is the case with the physical environment, the culture and society of the region have also undergone fundamental alterations. According to the 1951 Census of India Report, which paints a picture of the country just after its independence, about 95% of the population of the region belonged to cultivating classes, whereas in 2001, only 13% were engaged in cultivation – identified as mainly a secondary source of incomes. The expansion of quarrying has largely affected the condition of agriculture by making it physically impossible. Apart from the Raja of Pakur, all entrepreneur-owners of stone quarries originate from outside of the region but have come to control nearly every aspect of the industry. They have immensely benefited from the industry and have created a new social fabric that is in tune with the mores of the khadan jobs. The work relationships of khadans have impacted upon the social and cultural relationships of indigenous communities. The new social relationships have followed those created at, and by, the khadans, have had the greatest impact on women, whose roles have been marginalized, and whose jobs have become dispensable.

The groups that have survived on the meager resources provided by the land, including water, fish and weeds from local ponds, and fruits and fuelwood from orchards have suffered the most (Minewatch, 1997; Howitt, 1996; Ghosh, 1996). The ecologies of the adivasi communities of the past have been the most upset
by the expansion of quarrying in the last 30 years or so. The resource processes adopted by the indigenous communities were based on a judicious mixture of gathering, shifting cultivation, sedentary farming and artisan crafts. This concurrent use of several natural resources was in tune with the subsistence base provided by the region’s environment. The indigenous communities of eastern India are well known for their egalitarian structure; however, the sudden and drastic changes occurring from the recent boom in the quarrying industry have led to a maldistribution of benefits, emergence of new interest groups, changes in material culture, imposition of social costs, and finally, alterations in the gender norms of *adivasi* cultures. The entrepreneurs have emerged as the new power groups in the regional economy, enjoying rather high profit levels as compared to their investments. Local communities have emerged as cheap labour providers in the new resource extraction economy but have failed to gain a substantial livelihood through these jobs because of the loss of their natural habitat that provided them with other sources of livelihood. The introduction of financial capital, organized sectoral allocation of responsibility, and labour and wages with associated strict formal differences have prevented local women from benefiting fully from the industry.

The traditional income-generating activities performed by the *adivasis* – the collection of forest products, silkworm rearing, lac growing and sabai grass cultivation – have all been affected. The pressures exerted by a declining resource base are visible when the local trains coming from Barharwa are inspected: bundles of fuel wood are not only packed in almost every compartment but the large loads are also found hanging on the outside of the train. This fuelwood, which originates from the nearby forests of Litipara, Hiranpur and Lakshmipahar, are carried by bullock carts to the domestic market of Pakur for sale.

Mainstream values have not only affected gender relations but have also altered *adivasi* perceptions of the environment. The forests that so far seem to have survived the expanding quarry industry are, in fact, now being destroyed in an effort to meet the basic needs of people. The habitat conditions required for silkworm rearing and lac growing industries have changed to such an extent that they, too, have declined; sabai grass cultivation is an indigenous source of sustenance that has entirely disappeared from the area. According to village *pradhans* (heads) of Pahariyas, sabai cultivation has ceased due to their lack of direct access to markets and the interference of *mahajans* or middlemen. However, the fact that the agricultural plots adjacent to the quarries have become strewn with dust and fragments of various sizes has deterred the expansion of agriculture. The powerful quarry owners are subsuming the interests of poor indigenous peasants. The social costs of the quarrying industry have fallen to the least benefited class in the *khadan* economy. The *khadans* have physically encroached upon agricultural land and invaded the psyche of the local cultivating classes. Though the *adivasis* are essentially marginal to the mainstream quarrying economy, their value systems have also changed. Thus, on the one hand, traditional alternative occupations have declined directly or indirectly due to the impacts of quarrying, whilst on the other, employment at quarries has become the only source of income.
In *adivasi* societies, women work alongside men instead of placing emphasis on their reproductive tasks, thus leading to a lower fertility level *vis-à-vis* the mainstream Indian population. As livelihood resources become scarcer, women find themselves disempowered and without many choices. Moreover, the new economy imposes new behaviour codes for women that emphasize their domesticity, and hence, those women who work in the *khadans* become objects of male lust. As *adivasi* communities cannot afford to keep their women within domestic spheres, they find it difficult to accept the fact that their women are equal in terms of labour value. Increased violence against women at home and at work has become common, and decreased security of livelihoods offers women no choice but to accept the very jobs that devalue their labour. As local perceptions of gender relations change and begin to reflect those of the mainstream society, women become obliged to surrender to the forms of exploitation offered to them by the quarrying economy.

Several authors have noted the separation of men and women’s worlds in mining economies (see, for example, McDowell & Massey, 1984). Work at mines is commonly seen as a dangerous, hard and hazardous masculine job that contributes to a particular form of male solidarity and endows the manual labour with attributes of masculinity. The unequal economic and social relationships between women and men imposed by the social organization of the new mining economy makes the position of women subordinate both directly and indirectly. In the *pathar khadans* of Rajmahal, gender inequalities have also defined a place for women: at the very bottom of the mining economy.

**IN SEARCH OF GENDER-INCLUSIVE POLICIES IN INFORMAL MINES**

The formal mining sector has increasingly excluded women (Lahiri-Dutt, 2000; Metcalfe, 1987), whereas informal mining features a substantial female labour contingent. The case of women workers of the *pathar khadans* of Rajmahal encourages us to ponder about the position of women in mining as a whole, and to put forward a strong case for mainstreaming gender issues in mining. As we have seen, local environmental issues are inherently related with issues of women’s work in informal mines. In developing countries with poor track records of policing and legal enforcement, informal mines present several challenges that are better seen holistically through a gender lens.

The case of women workers in informal mines points to the need for making the work of women more visible, especially in this sector, where they are still participants in the productive process. It helps us to develop a gender perspective in informal mining, enabling us to value the work of women workers of poor communities in the entire mining economy. Such a view ensures that women are not treated as an inherently “vulnerable group” needing protection and/or passive beneficiaries, and seen as important actors and stakeholders in mineral resource management. A gender approach also facilitates an understanding of the causes of the subordinate and vulnerable position of women, and the exploitations and
difficulties they face in assuming their economic and social roles. Women’s roles in informal mining and the realities of exploitation have to be placed in a broader context alongside those of men if they are to be identified, recognized and assigned value in planning and decision-making in the mining industry.

Involving women as well as men is not only desirable for solving practical problems and ensuring increased equity between women and men in mining, but it is also increasingly apparent that the full participation of women is essential for sustaining economic development. As noted earlier in this chapter, women’s issues are better understood from a holistic perspective, that does not separate the physical and social changes in a mining region. Women of poor communities as resource managers at the household level can tell us a lot about sustaining local environmental quality.

Within the field of mineral resources management, although there is increased awareness that development cannot be sustained without the participation of local communities, gender has not yet been established as one of the most important socio-economic factors to be taken into account. There is still a significant lack of understanding of the roles and responsibilities of women in all areas of mining. In addition, most technical or engineering planners lack the necessary knowledge, skills and tools to incorporate gender analysis into their programmes. Concrete involvement with gender issues is still largely dependent upon individual awareness and commitment.

A major failing in all areas is the lack of attention given to gender in policies – at both the international and national levels – dealing with aspects of informal mines or formal mines. Laws and policies related to mining should therefore be revised wherever necessary to give women and men equal rights to land resources and representation to all mining activities at all levels. Documentation on mining projects often lack clear information on the involvement of women and the jobs they perform. The lack of attention given to women in documentation gives reason to believe that the actual importance placed on gender is, in reality, not significant. Gender strategies tend to be underdeveloped in mineral resource management, involving ad hoc activities or interventions that have no long-term benefit for women.

Women are usually seen as users of domestic fuel like coal, and as volunteers with unlimited resources of time and labour, and are not consulted at the time of preparing Environmental Impact Statements. They are seldom treated as managers of local natural resources, and as those who are most affected by resource deterioration. In mining, it is taken for granted that men have public roles at the community level, performing such tasks as consultation with management and public decision-making. Women are presumed to have domestic roles – namely, the collection and use of fuel and water, care and education of children. Technology, when present in mining, tends to displace women workers. This has led to a “welfare focus” in mining-related development initiatives, in which men obtain all the more “productive” and formal management roles – i.e. those involving skill development and monetary rewards.

In all forms of mining, communities and households are displaced physically and from traditional occupations, which change peoples’ livelihoods completely
or lead to a decreased access to subsistence resources. We have noted that these changes have gender implications since women and men make different contributions to household livelihoods. Failure to take gender roles and responsibilities into consideration can lead to displacement, particularly the women of proper groups and communities. The undervaluing of women’s roles and needs can lead to development interventions such as formalization at the expense of women’s interests. Women miners are not seen as economic actors in their own right but are a vulnerable and marginal group. The creation of a participatory environment for women in mining would provide a basis for their involvement in sustainable developmental planning and decision-making; a greater involvement of women in community consultations is one way of ensuring that their voices are heard. As mine workers, women require training and support to enable them to take part in consultation and negotiation processes. In mining, men inordinately dominate the organizational and institutional environments, whilst it is women’s hard work that sustains the more informal forms of mining. It has now become essential to acknowledge women’s work and plan more inclusively.

REFERENCES


