

V. Management of Surface Quarrying

As well as renewable resources such as forests or water and the advantages of a salubrious climate, the Doon Valley, during the last few decades, had some important non-renewable mineral resources that have played an increasingly significant role in the valley's economy. Limestone, marble, gypsum, and phosphorite of high grade are located in the krol formation within the Mussoorie hill at the northern extremity of the valley. Starting from Hathipaon in the north-west, and stretching to Ranipokhari in the south-east, they form part of a 50 km long mineral belt. Through the process of natural erosion during the monsoon, limestone boulders are found in significant quantities on the beds of the Himalayan torrents coming down from the Mussoorie hill.

For a long time, limestone boulders coming down from the Mussoorie hill were collected and burnt to make lime. This became an important commodity for export to the plains. With the arrival of the railways in the early 1900s, the mineral deposits formed linkages with other diverse requirements in the plains of British India. At this stage there was no organised process for mining or quarrying, and the forest department used to sell the collection rights for lime bearing boulders, from the streams passing through the forests, at the rate of Rs. 5 per 100 cu. ft. The local landlords, too, started selling limestone boulders rolling on to their land. The economic potential of Doon limestone encouraged the Government to claim legal monopoly over this resource by defining the collection of boulders as mining. However, the legal validity of this official order was challenged by the landlords in the law courts. The court upheld that collection of boulders rolling on to someone's private land was not tantamount to mining and could not be controlled accordingly. In this way, right from the beginning, the courts became involved in the management of limestone extraction in the Doon Valley, a tradition that has been creditably and creatively maintained until today.

The Growth of the Quarry Economy

In the interim revision of the settlement report in 1904, all minerals were declared to be government property. Thus, all minerals and quarrying came under the control of the Government. By 1910 two quarries in the Eastern Doon and two in the Western Doon were under operation. Until that time the main use for limestone was in lime making and around the 1900s Doon Valley was exporting about 6,500 tons of lime.

Slowly but steadily the use of Dehradun limestone became diversified. In 1936, more organised attempts at quarrying were made, when marble deposits were opened up near Bhatta village on the Dehradun-Mussoorie road. However, due to several reasons, including the opposition of the rural people, quarrying operations remained small scale. In 1947, with the partition of India and the formation of Pakistan, supplies of high grade chemical limestone, from Pakistan, to the sugar and textile industries in North India stopped and the high grade limestone of Doon Valley replaced them. A number of refugees from Pakistan, who had been involved in limestone quarrying there and possessed extensive knowledge of the market, came over to Dehradun through a process that can be called the "lime rush". The scale of quarrying instantly increased as did its contribution to the economy of the valley. At this point there was no organised and strict methodology for monitoring the quarries that were located mainly on the hill slopes.

In 1949, the Government of India passed the Mineral Concessions Act, under the Mines and Minerals Regulation Act of 1948. According to this Act applications were subsequently submitted to the State Department of Industries for 20 years quarrying leases in the Doon Valley. The leases were not granted immediately, probably due to lack of dependable information on the total economic potential of the mineral belt.

In 1959, after examination of the potential of the limestone belt, the Geological Survey of India estimated that a total deposit of 400 million tons in the Doon Valley could be quarried. It was in 1960 that the Government of U.P. passed the Mineral Concessions Rule, according to which 20 year leases were granted. Initially 17 leases, covering an area of 450 hectares, were granted. In the early 1980's there were about 100 leases covering an area of about 1400 hectares. During the 1970s, because of this expansion, limestone quarrying became the central economic activity of the valley. This growth is reflected in the fact that the total extraction of limestone and marble from 1977-82 was at least two orders of magnitude larger than the total extraction in the 1900s (Table 6).

Problems of Environmental Impact Monitoring

Because of the considerable increase in quarrying activities in the Doon Valley, over the space of a few years, the environmental impact of the quarries became a source of criticism. There were no clear guidelines for monitoring this environmental impact, and the history of the knowledge and laws on mining had been largely dominated by coal mining experiences in the relatively flat plains of eastern India. There was no adequate knowledge for the supervision of mining in ecologically sensitive areas such as the Doon.

The incidence of quarrying in the mountains is not great. Yet, the Himalayas have a variety of rich mineral resources which could be of economic value. It is in this context that the experiences with mineral exploitation in the Doon Valley become more general than local, the

most important element being the use of law in the management of natural resources.

As the scale of quarrying in Doon Valley expanded over the years, the cumulative environmental impact became prominent, and the issues of environmental management and monitoring became increasingly urgent. The quarry operators tried to maximise their profits and often resorted to irregular quarrying processes that rarely attempted to minimise negative environmental impact. The administrative structure was inadequate to embrace the problems of environmental degradation within the framework of its existing rules and regulations. As a result debris from the quarry sites covered large parts of the hill slopes, damaged agricultural and pasture land, choked the riverbeds and canals, upset both urban and rural water supplies, and left ugly scars on the hillslopes that were injurious to the scenic beauty of the tourist town of Mussoorie.

The environmental impact of quarrying on the hill slopes most directly affected the agro-economy of the villages, but the rural people were not strong enough at that time to launch a campaign against it and hence their early warnings were inaudible to the decision makers. The State Government, however, was not totally insensitive to the developments. In 1974-75, a survey examined all the quarries in the Doon Valley and erring quarries were issued "show cause" notices on the basis of the results of the survey. This was not, however, totally effective in rectifying the working style of the quarries and consequently some leases had to be discontinued.

Table 6: Extraction of Limestone in Dehradun Tehsil During 1977-82 (in Metric Tons)

Year	Limestone (Major)	Limestone (Minor)	Marble	Total
1977	323753	101010	103213	527976
1978	436561	100515	106996	644072
1979	520454	114760	134774	769988
1980	390572	121879	136321	648772
1980-81	430278	132202	139015	701495
1981-82	471196	166962	123278	961426

Source: Directorate of Geology and Mines (Uttar Pradesh)

For the first time, the scientific, legal, and ecological issues related to the management of limestone quarrying came to the fore most dramatically in a Supreme Court Case in 1977. In 1970 an application was made for a lease to open a quarry on a piece of land bordering the main road connecting Dehradun and Mussoorie. There was a rival contender for part of the area. For whatever reasons, the lease was not granted and after a number of litigations the Union Government directed the State Government to execute the leases. In a dramatic turn of events, the State Government disagreed with the order of the Union Government and stressed that the granting of the leases would "affect the natural beauty and ecology of the region". Whether such a stand was a result of a genuine understanding on the part of the State Government, or whether it was inspired by the rivalry between the two contenders, is not clear but it decidedly opened up many significant issues related to the management of surface quarrying in the Doon Valley.

The objections of the State Government were rejected, and the case went to the Supreme Court of India through a special leave petition. The Court ordered the formation of two committees, one on environmental impact assessment of quarrying in Doon Valley and the other on technicalities of quarrying operations. It advised the Union Government to make a final decision only after giving due consideration to the reports of these committees.

The report on environmental impact was prepared by a group of eminent scientists holding senior positions at various national institutions dealing with natural resource management. They were not strictly mining engineers. The report on mining technicalities was prepared by very senior officials of the Indian Bureau of Mines (IBM), a group that was highly competent in the field of Mining Engineering. The difference in the recommendations of these two reports clearly underlines the influence of different disciplines in understanding and evaluating the impact of limestone quarrying in the Doon Valley. The interdisciplinary report on environmental impact pointed to the environmental sensitivity of the region and indicated that granting quarrying leases would accelerate slope instability, soil erosion, siltation, and debris accumulation on the riverbeds. It also argued that quarrying would generally destroy the scenic beauty and that this might have

negative effects on tourism in the hill-station of Mussoorie. The disciplinary report from the Indian Bureau of Mines reported that:

there was no major structural disturbances within the area, which may cause instability to mines working. The hill slope is fairly stable.

The Union Government must have found it difficult to moderate the differences in the absence of a clear understanding of the meaning of the word "ecology". The lease operators argued that:

The composition of the officers (committee) which has given the report of the environmental impact of limestone quarrying is such that they cannot give authoritative findings as far as the geological and structural factors of the Dehradun-Mussoorie road are concerned and the IBM's report should be accepted in this regard.

The absence of a well-articulated law or working rule to assess "environmental impact" was a major obstacle preventing the Union Government from taking an environmentally informed stand. On the other hand, a clear understanding of the term "ecology" was equally lacking on the part of the State Government who had initiated the case and the debate on it. Indeed in the 1970's, after the 1972 Stockholm Conference on Human Environment, "ecology" became a widely used and little understood word. Ill informed use of such words will ultimately be counterproductive, as is evident from the following sentence; an order of the Government of India, further recommending the issue of leases in the above case, explained:

although the representative of the State Government was at pains to stress the point regarding the "beauty of landscape" yet it has not been satisfactorily explained by the State Government's representative as to how the ecological and environmental factors would be disturbed.

The Supreme Court, however, was sensitive to the ecological issues. When the Union Government ordered that leases be granted, this order was followed by the appointment, by the Supreme Court, of a senior advocate as a Commissioner to make an on-the-spot enquiry. He

recommended that the lease applicants be granted leases, not in the area applied for, but within an area already leased to a State owned mining company. In a surprise move, when the Union Government's order and the report of the Commissioner came up for final hearing, the State Government withdrew the case. The use and misuse of the words "environment" and "ecology" are best demonstrated by the following order of the Supreme Court, dated October 3, 1979:

We are surprised at the turn of the events in this long protracted litigation. Early in the day when the Central Government passed an order directing the leases to be granted for mining in an area which was supposed to be ecologically precious for the country, the State of UP came up in appeal and we were led up the garden path in believing something extraordinarily injurious to the country was taking place if the leases directed by the Central Government were to be issued... When expectations had risen high and new rights were being crystallised a new light dawned on the Government of UP that there was victory in retract. Quietly, the State represented that the State was seriously considering to withdraw the appeal filed by it and forgot about the apprehension of ecological catastrophe which brought it into this Court.

The above episode clearly points to the real confusion in the management of quarrying. Indeed the case in the Supreme Court, though finally withdrawn, was a meaningful indicator of the seriousness of the situation. By the end of 1980, another important administrative issue related to the environmental impact of quarrying cropped up. This was the policy for renewal of quarry leases that were granted in 1962 and would complete the stipulated 20 year period from 1982 onwards.

In 1978 a committee was formed, headed by the District Magistrate of Dehradun, for the purpose of examining the environmental impact of quarrying and, if needed, for recommending closures. The committee's recommendations led to a government order in 1979 closing quarrying in Bhatta and Kiarkuli villages along the Dehradun-Mussoorie Road, Gagoli power house, and the Sahasradhara spring. In the Bhitarli and Kiarkuli valleys the granting of new leases was to be based on merit. The Hathipaon-Banog area was available for lease on the

basis of suitability. All leases lying above the forest road along the Song Valley were not recommended. Reclamation of land left derelict by mining was to be concomitant with mining.

In 1981 the Department of Industries (UP) appointed another committee to determine the renewal policy for a number of quarrying leases expiring in 1982. This committee decided to discontinue quarrying in the Sahasradhara area because of the impact on the Baldi Nadi and the consequent impact on tourism. In the Arnigad Valley quarrying was to be continued except when mining rules were violated. All quarries on the Dehra Dun-Mussoorie road were to be closed. In Bhitarli Valley leases were to be renewed on merit. It was recommended that quarrying be discontinued. In Banog, block quarrying was permitted to continue as long as the Kempty Fall and the water pumping station of the Mussoorie Municipal Board were not damaged. In Song Valley complete closure was recommended, because of the dip-slope mining that had placed the stability of the entire mountain in danger. On these bases, renewal was recommended for nine out of the eighteen leases. The others were not recommended for renewal on the basis of ecological factors and the absence of safe mining conditions. However, another wave of ecological sensitivity must have overwhelmed the Government of U.P. because, instead of taking case by case decisions as per the recommendations of the technical committee, it put a blanket ban on the renewal of quarrying leases.

The decision was immediately challenged in the High-Court by the lease operators who, including those whose renewals were not recommended by the technical committee, all procured stay orders from the High-Court to continue quarrying. The stay orders led to more severe and environmentally reckless mining because the lease operators tried to maximise returns during this period of uncertainty about future opportunities and policies. Moreover, official inspection, monitoring, and control became, reportedly, marginal as the stay order was sometimes interpreted by the quarry operators as immunity from government interference.

Although the earlier case in the Supreme Court was withdrawn in its final stages, it had a positive impact on the environmentally sensitive minds within the Government. To enable a better informed

decision-making process and to increase their knowledge about various environmental problems in the valley, including the impact of quarrying, the Union Department of Environment commissioned an ecosystems evaluation study of the Doon Valley (Bandyopadhyay et al., 1983).

The report on the natural resource utilisation in the Doon Valley, submitted in May 1983, not only provided the officials with a better ecological understanding of the Doon Valley so that they might undertake environmental monitoring on a more scientific footing, but also, as a result of its participatory methodology, it enlightened the local rural and urban population on the state of their own physical environment and the problems arising from its continued deterioration.

During the same period, another publication by a group of socially aware journalists provided an account of the sufferings of some villagers affected by the negative impact of limestone quarrying. (Prasun et al., 1983). At this stage ideas about the negative impact of limestone quarrying evolved from vague feelings to objective writings and began to provide realistic inputs for an ecological approach to natural resource management. The credit for this does not go to any one individual. However, the pivotal roles played by individuals in important administrative positions should not be forgotten. The ecosystem study had, as its most powerful supporter, N.D. Jayal, the then Joint Secretary in the Department of Environment, Government of India, and undoubtedly the environmental research and action in Doon Valley would have been very difficult without such support.

From Ecosystems Research to Public Interest Litigation

The report of the ecosystems study on Doon Valley (Bandyopadhyay et al., 1983) brought out the unique orographic, geological, and meteorological features of the valley that led to its ecological instability. It pointed out that ecology cannot be equated merely with scenic beauty. Ecological linkages are a complex of active relationships and an interdependence of natural resources and resource processes. Human beings are active elements in the ecosystem. The study provided details of the nature of the hydrological destabilisation, caused by the quarries, to which was attributed the increased flood-plain inundations and droughts in the

valley, as well as the accumulation of huge amounts of rejects and debris in the riverbeds from the quarries. The loss of agricultural production and the reduction of pasture land caused by the impact of quarrying was minutely studied and quantified for the first time. The study projected a major water crisis in the valley if environmental regeneration was not undertaken in time.

The main findings of the ecosystems study received wide public attention through the press, and in these the residents of the valley found scientific support to some of their criticisms of the functioning and impact of the quarries. All these were extremely important from the point of view of generating ecologically informed public opinion.

Initially intervention and initiatives to stop environmental damage were discussed. Without waiting for the Government to act, the Rural Litigation and Entitlement Kendra (RLEK), an organisation supported by the Legal Aid Programme of the Supreme Court of India, came forward to file a public interest writ petition (RLEK and Ors. vs. State of UP and Ors., 1983). On July 14, 1983, within a few weeks of the completion of the ecosystems study, the Supreme Court of India admitted the writ petition. In another expression of public protest on July 18, 1983, the citizens of Mussoorie brought a petition against quarrying to the Upper House of the Indian Parliament on the basis of the above findings. The litigation was also supported by the interventions of two important citizens' groups, the Save Mussoorie Society and the Friends of the Doon. Later, a students' environmental group in Delhi, *Kalpavriksh*, together with a number of villagers supported by the famous Chipko movement, filed another petition against limestone quarrying. This was later heard by the Court together with the earlier petitions. The importance that the Supreme Court gave to this public interest litigation was clear from the following statement in its interim order of March 1985:

This is the first case of its kind in the country involving issues related to environment and ecological balance and the questions arising for consideration are of grave moment and of significance not only to the people residing in the Mussoorie hill range forming part of the Himalaya but also in their implications to the welfare of the generality of the people living in the

country. It brings into sharp focus the conflict between development and conservation and serves to emphasize the need for reconciling the two in the larger interest of the country.

The court based its acceptance of the case on a much broader and deeper understanding of the people's right to life. The concept of life was not restricted to the narrow concept of mere biological survival. It was described as:

the right of the people to live in a healthy environment, with minimal disturbances of ecological balance and without avoidable hazards to their cattle, homes, and agricultural land and undue affection of air, water, and environment.

Such clear articulation, from the highest court in India, of an ecological right to life encouraged new legal steps to institutionalise the concept of a stable and healthy environment as an essential requirement for exercising one's right to life. In the interim order the court restricted many of the quarrying activities to smaller geographical areas, and in August 1988 it handed down the final judgement closing all but six quarries and banning any renewal of quarrying leases in future.

This public interest litigation is a trendsetting case in the judiciary's intervention in natural resource management. The success of the case has several unique foundations. It is important to understand the step by step development that led to this intervention, from an ecosystems research to a trendsetting judgement from the Supreme Court of India. It is also important to identify the main actors in the process.

The ecosystems study (Bandyopadhyay et al., 1983) was undertaken in a participatory manner so that it was able to solicit objective information on the environmental impact of quarrying. It also enlightened the individuals affected about the ecological base of their sufferings. In this manner the study liberated the meaning of ecology from the fashionable concept of scenic beauty and connected it with fundamental human rights of access to basic natural resources, such as water, pastures etc. (Bandyopadhyay and Shiva, 1984). The scientific information generated by the ecosystems study was competently used by the public interest litigation.

However, notwithstanding the scientific competence, the litigation would probably have had difficulty in being accepted even if "right to life" had not been interpreted correctly by the court in a holistic and ecological perspective. In spite of being admitted, the case would not have drawn the interest of the Government if it had not been patiently pursued by the coordinator of the RLEK, Awadhesh Kaushal, and a large number of local citizens. Another important element in the success of the case was the people's expression of protest right from the beginning of the case until its completion.

On November 11, 1983, a massive public protest against quarrying was organised in Mussoorie, when, following the petition, a parliamentary enquiry committee came to the valley. It must be stressed that during this process the people of the valley had become so well informed about the basic ecological arguments that any government official, who tried to extend unjust and unscientific support to the destroyers of the Doon Valley ecology, was soon cornered by the people who did not shy away from scientific debates. The people of the Nahikala area of Doon Valley organised a sit-in on the hill road leading to one of the quarries that was later closed following the final Supreme Court judgement. This unique and courageous non-violent protest was organized by the Chipko activist, Dhum Singh Negi, with the support of the local villagers. All these, together with a fair amount of press coverage, laid the foundations for a real public interest litigation related to environment. (Iliste and Goranson, 1984; Bandyopadhyay and Shiva, 1987).

Challenges in the Management of Surface Quarrying

The experiences related to the management of surface quarrying in the Doon Valley provide important information on the policies and strategies that should be adopted for quarrying in the mountain regions. The experiences go far beyond the scope of simple departmental management. On the one hand they relate to ecosystemic research, on the other they relate to informed public action and the law.

In view of the fact that rich mineral deposits are available in the Himalayas, and that there will be continuous pressure from the industrial sector of the country for these minerals, it is important to analyse the

challenges that these issues of quarrying in the Doon Valley present. It is particularly so because, whereas in the specific case of the Doon Valley, due to unique circumstances, quarrying has been largely restricted and regulated, the restriction and regulation is not applicable to the immediately neighbouring mountain areas of Kumaon, Garhwal, and Himachal Pradesh. Accordingly, the first challenge this case presents is the challenge of extending ecologically informed decisions beyond the geographical boundary of the Doon Valley.

The question is how can an experience emerging from the specific cultural parameters of the Doon Valley be used in other areas? At the same time, this case presents the challenge of extending experiences to areas beyond the geographical boundary of the valley but having similar ecosystemic characteristics, such as slopes, intense rainfall, geological instability etc.

On the level of specific socioeconomic parameters, the experiences of the Doon Valley provide a rare example of informed and sustained public action in natural resource management. In various phases of this action, people took upon themselves regulatory responsibilities, sometimes unilaterally, sometimes in coordination with government bodies. In the remote rural areas, the Chipko activists unilaterally stopped the movement of trucks to and from the quarry sites by peaceful means. The urban residents of the valley spent long hours at a large number of quarry sites to regulate the collection of minerals following the closure of these quarries by the Supreme Court. This was done under the co-ordination of a senior government official. In this way the Doon experience exemplifies a delicately balanced collaboration between informed citizens and concerned administrators. In this respect, the contribution of another senior official should be mentioned. D. Bandyopadhyay, the then Rural Development Secretary, Government of India, who was

chosen by the Supreme Court to take up responsibilities in connection with the Doon Valley litigation, facilitated the close involvement of local residents in the monitoring of quarrying activities.

The challenge lies in making the most of these experiences and extending them to other mountain areas. Firstly, ecologists should identify the ecosystemic characteristics of particular valleys and of the Himalaya in general, to provide a scientific background to the various dimensions that may be involved in the environmental impact of mineral extraction. Secondly, the law-making bodies should internalise these ecosystemic characteristics and introduce new regulations, rules, and monitoring systems related to quarrying in the Himalaya. The perspective should include not only outer hillslope impacts, such as increased run-off due to debris, but also hydrogeological impacts on the storage and flow of groundwater in the parched aquifers. The direct impact of the Doon Valley case is seen in the changes in mining laws to include mandatory environmental reclamation by mining agencies. It has induced official circles to consider the optimum method for monitoring the environmental impact of mining in the hills.

Thus, a single case in the Supreme Court has brought home the fact, to all concerned, that the mountain perspective in mineral exploitation in the Himalaya has so far been conspicuous by its absence. As long as this perspective is omitted from impact assessment, administration, and monitoring, the legal authorities will be pressured to take actions that normally lie within the jurisdiction of the administrative bodies. The society has to be responsible for the stability of the mountain ecosystems and the socioeconomic survival of its people. Learning from the Doon Valley experiences, the Government and the society must ensure the timely introduction of a new administrative framework to give popular initiatives their rightful place in natural resource management.