CHAPTER - VII

CONCLUSIONS AND SUGGESTIONS

The foregoing analysis has highlighted a number of major findings on the basis of which the following are the brief summary and major conclusion drawn for the purpose of suitable policy measures viz.

1. Interest in sustainable development and conservation of resources is of recent development. Earlier development theory emphasised exploitation of resources for the welfare of the people rather than their conservation. It followed the consumption approach. During the seventy's of last century, the MIT scientists threatened the world of "doom day" within the next 150 years, if suitable steps are not taken to alter the present high life style, requiring high rate of exploitation of resources causing their complete exhaustion in the very, not the distant future. Later researchers dispelled the Malthusian fear of 'dooms day'. Nevertheless, the researchers emphasised the need for conservation of natural resources and sustainable development to maintain optimum balance between the present and the future.

2. Economic development cannot be imagined in the absence natural resources. The quantity and quality of natural resources coupled with technology, ultimately determine the state and extent of development in any country. Natural resources are of two categories viz., a) the renewable resources, which do not pose a
serious problem, and (b) the Exhaustible resources, which are non renewable resources. They have to be optimally used keeping in mind their inter temporal equity and availability. The unequal distribution of world resources among the countries of the world, compels each country to take measures for optimum utilisation of resources available within the country. Incidentally, it may be noted that even the renewable resources also pose a serious problem, if the rate of exploitation of such resources exceeds the rate of their replenishment.

3. The general rule for optimisation of resources is the equation of marginal revenue and marginal cost and while applying this rule some differences between the case of reproducible goods and irreproducible goods are to be noted. Time factor is important in the case of exhaustible resource. The satisfaction of three following conditions is necessary for optimum utilisation of an exhaustible resource viz.: i) Price = MC + Rent, ii) Price today = discounted price of tomorrow and iii) Extraction today + Extraction tomorrow = Total stock of the resource. The theories of Grey and Hotelling, have applied these conditions in the case of an individual producer and the industry and have arrived at the same conclusion. The optimum rules have been applied under the different market structures, notably perfect competition and monopoly. Their implications have been examined under different situations viz. with certainty and with uncertainty. The analysis of optimal utilization under different markets shows that monopoly is the
friend of conservation. Under perfect competition there is reckless exploitation of the resources leading to fast depletion. Under monopoly, there is slow rate of exploitation and slow rate of depletion of resource.

The empirical investigation suggests that quarrying activity is carried on, on competitive basis still there is no fear of its earlier exhaustion. The responses from the owners and workers reveal that what has been used in the last 100 years or so is just the 'tip of the iceberg'. Many of them feel the quarry resource will not be exhausted even in the next five to six hundred years. There is no necessity of its controls through public monopoly. The government however can charge an appropriate, royalty taking into account the profit earned by the owners and a fund can be created out of this profit that could be used for improving the living conditions of the quarry workers.

4. Gulbarga district in Karnataka State is the biggest district in area among the 27 districts of Karnataka. It is socio-economically backward district. It consists of ten talukas, viz. Afjalpur, Aland, Chincholi, Chitapur, Gulbarga, Jevargi, Sedam, Shahapur, Sorapur and Yadgiri. According to the 1991 census the total population of Gulbarga district is 25,82,169 persons and average population of the taluka is 2,58,217 persons, of which 19,72,366 persons are residing in rural area and 6,09,803 persons residing in urban area. In other words rural residents are 76.38 % and urban 23.62 % of the total population of Gulbarga district. The overall
density of population in this district as per 1991 census is 159 persons per sq.kms. The rural density of the population is 123 persons and urban density of the population is 3,230 persons in urban areas. As per 1991 census 13,16,088 are males and remaining 12,66,081 are female. The sex ratio is number of females per thousand male worksout to be 962. The literacy rate of Gulbarga district worksout to be 38.54 % as per 1991 census. Regarding the distribution of workforce of the total population. 10,39,922 persons are main workers, 72,269 persons are marginal workers and the remaining 14,69,978 persons are non-workers, respectively constituting 40.27 %, 2.80 % and 56.93 % of the total population of the Gulbarga district.

A total of 200 quarry establishments spread over seven talukas of Gulbarga district has been selected for study. Since quarrying is heavily concentrated in Sedam, Chitapur and Jevargi talukas, nearly 75 % of respondents are drawn from these three talukas. In each taluka those villages where quarrying activity is predominant are selected. Thus the respondents are chosen from 39 villages spread over seven talukas.

Quarry exhibits a variety of relations among quarry establishments. In some, such relations are akin to agriculture. Quarry owner and worker share the activity of exploitation, digging and marketing and finally share the profit. On the other, hand the owner of the pit either individually or on partnership basis, takes the responsibility of quarrying activity viz., digging, shaping,
marketing etc. by hiring workers on wage basis. Quarrying activity has expanded beyond the owned lands to cope-up with increased demand. Entrepreneurs have taken government land on lease or paying royalty and in some cases three or four partners together have taken land on lease.

During the last quarter of a century, the government is striving hard to improve the conditions of the poor and weaker sections of the society. Almost all the people engaged in quarrying are backward. Among the 100 owner respondents, 51 respondents belong to forward caste, 21 owners belong to scheduled caste, 10 belongs to scheduled tribes and 18 owners belong to other backward classes. It means more than 50% quarry owners are from forward class. Whereas quarry worker respondents among 100, only 11 respondents are from forward class and 89 workers are from low caste with regard to educational status, 22% of the quarry owners are completely illiterate. The development programmes in education of the government even after five decades have not reached them. Against this, the educational status of the workers is worst. 2/3 of the quarry workers are completely illiterate.

Quarrying activity in Gulbarga district has exhibited two types of relations between the owner of the pit and workers engaged in it, namely, i) factory type and ii) Agricultural type. In the first case, the owner bears all the expenses and workers receive only wages for the work done, whereas in the other case both the owner and
the worker share the expenses according to agreed proportions and market the output jointly and share the profit. Of the seven talukas, only in two talukas viz, Jevargi and Sorapur, agriculture tenancy type prevails and in other 5 talukas factory type is found.

5. The output of quarry in Gulbarga consists of Katagal, Grapepoles, Hyder, Parcy, Bandi, Chavani and Khadi. The output has market not only within the district and within the state but also outside the state. In Gulbarga district, the primary investigation reveals that 200 respondents having totally 1080 pits are busy in producing quarry output and spread over an area of 1192 acres. Of the total 200 respondents spread over 39 villages in 7 talukas of the district, 100 are owners and others are workers.

The analysis of various types of physical output of quarry indicates that Katagals which are used for construction of building, basement of building, etc. are not of uniform size. Grapepoles which are used in grape farming as pillers for erecting mantapa, are having 9 to 10 ft in length. The stone bricks of different sizes varying between 1 and 2 ft, called Hyder, are used for corners in the walls of the houses, which makes the wall very strong. For flooring Parcy stones are supplied by quarry, in different in sizes and forms varying from 1 x 1, 2 x 2 and 2 x 4 feet etc. But Bandi stones are crude type of parcies, longer, wider and thicker, than parcies, which have normal size of 6 x 2 and bigger size of 8 x 6 feet, whereas the Chavani is the parcy type of stone, used over door and window frames, part of the stone protrudes outside, and
serves as wind and rain screen (weather board) and whatever remains at the end in the quarry is supplied as Khadi for road construction and other concrete purposes.

Further, in the chapter five the talukawise physical output is examined and analysed from the owner side. It is as follows:

a) Jevargi is the only taluka where Grape poles are produced. Its highest output is of Parcy (27,89,000 sq.ft) followed by the Katagal (1759100 in number) and Bandi (16,21,500 sq.ft.) In Jevargi 22 samples from 5 villages examined.

b) In Shahapur 14 samples from 4 villages were taken. The production there indicates highest output of parcy (68,70,000 sq. ft).

c) Sorapur is a small taluka with insignificant quarry output. Four respondents from three villages are analysed. The output of all items is small here. However, among them Katagal is leading with 1,40,000 in numbers. Sorapur is known for production of Chavani stones used over the door, window frames. On an average 14,000 Chavani stones are putup for sale in this taluk every year.

d) Gulbarga taluk though with district head-quarter has little scope for quarrying work. Still Parcy (36,20,000 sq. ft) and Bandi (1,83,300 sq.ft) are the major outputs.
e) Chitapur is highly concentrated with quarry output. It supplies raw materials to the cement industry also. It is the highest producer of parcy (2,61,26,000 sq.ft.) next only to Sedam. Since quarrying is concentrated here the study has major representation from this taluka i.e. 25 samples from 11 villages.

f) Sedam and Chitapur together have lion's share in quarry output. Sedam is leading with (2,73,00,000 sq ft) of parcy and with (15,11,000 sq.ft) of Bandi.

g) Chincholi like Shahapur and Sorapur is a small producer of output.

h) The district scenario indicates that Parcy, Bandi, Katagal and Hyder are the major outputs of the district. Among them parcy is leading with district average of (6,75,50,700 sq.ft.) followed by Bandi (56,48,465 sq. ft.).

6. The income to the owners of quarry pits is derived from the sale of quarry output. From the study, the average prices of different quarry output are found as follows :

- **Katagal**: This is a small brick type stone, used in building, the price is normally, Rs.200 per tractor load, and Rs.500 per Lorry load, which works out to be 1 to 2 Rupees per piece.

- **Grapepole**: These are the poles used to support grape creepers and also to fence the grape yard. These poles vary
from 6 to 10 ft in length. The price varies from 8 to 12 rupees, depending up-on the size. The average price is 10 rupees per pole.

- **Hyder**: These are cut stones used in building. These are used as corner stones. The normal size of a Hyder is 2x1x4 (2/3cft). It is sold for 4 to 6 rupees per stone. An average sized building would require 100 pieces of Hyder for construction.

- **Parcy**: This is flat stone used for flooring. Each stone is of the size of 2x2 with thickness varying from 1” to 2”. It is sold at 7 to 10 rupees, per piece depending up on thickness, colour, and quality of the pieces. Parcy is the output of quarry which is much in demand. Major income of the quarry is from the sale of parcy only.

- **Bandi**: These are crude type of parcies, longer, wider and thicker than parcies. The normal size is 6’ x 2’ with 3’’ (1/4 = 3 cft) It is sold for 20 rupees, bigger ones with 8’ in length are sold for 40 rupee per piece.

- **Chavani**: Chavani is a parcy type of stone used upon door and window frames, part of the stone protrudes out side, and serves as a wind and rain screen. Price varies from 6 to 8 rupees.
Regarding the income to the owners of pit, it is from the investigation found out taluka wise as follows:

a) Jevargi: Income from Parcy is highest Rs. 55,78,000 followed by income from Bandi 34,43,000 Rupees and Katagal 26,38,650 Rupees respectively. These two together yield most of their income. The sale of the grape pole yielded about 8,55,360 rupees per year and the average income to the owner of a pit works out to be 5,87,345 rupees.

b) In Shahapur also Parcy and Bandi bring maximum income to the owner. They are 1,37,40,000 rupees from parrcy and 38,46,800 rupees from Bandi respectively. Khadi income is insignificant compared to others. It is only 4350 rupees. There are 14 samples in this taluka. The average income for each is 12,72,228 rupees.

c) In Sorapur Chavani stones and Parcy are the two important sources of income. Together they yield substantial income. Chavani stones are popular especially in Sorapur. However income from them is only 16,800 rupees. While the income from Katagal is Rs. 2,80,000. The average income to the owner in Sorapur taluka works out to be 80,082 rupees. This is one of the lowest incomes in Gulbarga district.

d) Gulbarga also follows the same pattern with Parcy and Bandi as major income earners. Parcy fetches 90,50,000 rupees and
Bandi 4,58,250 rupees. From the only seven samples, it is found that the average income here was 13,61,485 rupees.

e) Chitapur and Sedam are at the top of the list. Grape pole and Chavanis are not found in Chitapur. Income from the sale of Parcy is highest with 6,53,15,000 rupees. The income from Hyder was the lowest here. The average income to the owner was calculated at 26,68,196 rupees.

f) Sedam is the leading taluk from the point of earnings of owners. Income from Parcy was 6,82,50,000 rupees and from Bandi 37,77,500 rupees. The income from others where substantial but, not very high. The average income here was 28,26,326 rupees.

g) Chincholi has average income to the owners at rupees 8,15,650. However, major income was from the sale of Parcy.

h) The district income to the quarry owners (100 samples) works out to be 3,39,501 rupees but there are wide variations in averages among the talukas at the top Chitapur and Sedam have Rs. 26 to 28 lakhs per owner and at the lowest wrung of the ladder, the owner get only Rs. 80,000 in Sorapur.

In order to ascertain the net income position of the owner. We enquired the expenditure pattern of the owners. The main items of expenditure are the following : wage, rent, agency expenditure etc.
The entire expenditure is split into two broad categories viz. a) Fixed expenditure consisting of government fees, salary, royalty, rent, managers salary, etc and b) The variable expenditure covering, wages paid to the workers, transport expenditure and other incidental expenditures connected with output. The expenditure pattern across the seven taluks of the district is not uniform. The fixed expenditure is as low as 19.61 % of the total income in Chincholi. But it shoots up to as high as 31.69 % in Javargi. However, the average expand works out to be 26.79 %. As against this the variable expenditure is lowest in Chitapur with 29.21 % of the income and it is highest in Shahapur with 43.44 % of the income. The average figure here is 34.94 % of the income. The fixed and variable expenditures together constitute around 62 % of the income leaving a clear margin of profit of 38 percent of the income. The talukawise analysis shows highest percentage of profit to Chincholi owners and lowest to Jevargi owners. The highest percentage of profit in Chincholi is due to the very low fixed expenditure, while in Jevargi both fixed as well as variable expenditure record higher percentage of income and hence the profit margin is reduced there. It is interesting to note that in Chitapur and Sedam both fixed and variable expenditures are close to their heels. Thus these two taluks enjoy higher margin of profit of 45 % and about 41 % respectively. In terms of the average, profit to the owners of the 7 taluks can be arranged in descending order Chincholi 49.74%, Chitapur 44.34%, Sorapur 42.87%, Sedam 40.80%, Gulbarga 34.74% Shahapur 28.38% Jevargi 25.92%.
7. Gulbarga district is still one of the backward districts of the state, and suffers from the lack of infrastructure facilities. This causes the variable expenditures to shoot up in some taluks resulting in low margin of profit.

Most of quarry output is sold at the pits only. Hence the prices of quarry output are considerably low because the buyers do take into account the cost of transport as the quarry output is not a weight losing material. Another reason for low price is the prior contract entered into between the buyer and the quarry owners, on the basis of which the owners collect advances from the buyers and hence there would be no scope for raising the price.

8. Usually, the demand for quarry output is a local demand from builders and contractors. But in Sedam and Chitapur the demand comes from outside the state, especially from Maharashtra and Andhra Pradesh. In Sedam and Chitapur talukas, merchants from other states have set up their agencies to buy it from the local owners.

Marketing is mainly the responsibility of owners. But in Jevargi, both workers and owners make efforts to sell the output. The Clientele for quarry output shows that 37.05% of the total sales are to the consumers, 31.45% are to agents, 16% to contractors, 8% to officers and 7% to engineers. Classwise distribution of demand indicate 30.20% from upper class, 45.30% from middle class and 24.00 the lower class.
An important issue connected with exhaustible resource is the effect of quarrying work on environment. Nearly 92% of the owners have felt that there is no harmful effect of quarry work on environment, even in talukas like Chitapur and Sedam where quarrying is carried on an extensive scale. Even where quarry raw material is supplied to the cement industry it has not produced harmful effect over the years.

About exhaustibility of resources, 63% of the owners express fear about exhaustibility, in view of rapid urbanisation and population. However, they did not have any idea about when resource would be completely exhausted. On the other hand, 37% of the owners were absolutely free from any such fear and they express that resource would be available even for 500 to 600 hundred years.

In the chapter six, the problem of quarry issues are discussed from the point of view of the workers. From the investigation, it is found out that the physical output by the workers was relatively lower than that of the owners. In Jevargi taluka quarry production by workers is biggest in Katagal followed by Parcy and Bandi, and the output of Khadi is negligible here. In Shahapur, Parcy is the major output followed by Bandi, Grape poles are not produced here. Coming to Sorapur, Katagal is the major output. However, compare to the earlier two talukas output is quite low here. But Sorapur is famous for Chavani stones, which are not produced in other talukas. Gulbarga taluka has the least output of quarry.
However, within it parcy production is substantial. Chitapur again is one of the big producers of quarry output even from worker side. Workers produce 55,91,784 sq.ft. Parcy on an average every year followed by 7,41,424 sq.ft of Bandi per year. Sedam is the highest producer of Parcy 70,57,137 sq.ft. per year. Its output of Bandi is 6,22,853 sq.ft. though very high is second to that of Chitapur. Chincholi is a small taluk where except Parcy, (4,28,571 sq.ft), other quarry outputs are negligible. The average physical output in Gulbarga district is 15,86,947 sq.ft. of Parcy 24,77,256 sq.ft. of Bandi and 10,30,375 numbers of Katagal. The other outputs are not much.

12. The income of the quarry worker is the wage that he receives from owners for the output he produces, with the exception of Jevargi and Sorapur. In these two taluks, workers share the income which the owner receives by the sale of quarry output. The workers in these two taluks share some of the common expenses like digging, cleaning, clearing of bush etc. In Jevargi taluk, Katagal brings a income of Rs 8,38,000 in a year by way of share of the workers followed by Parcy Rs 3,82,000 and Bandi Rs 2,97,000. The average income of the worker here is about Rs 71,817. A clarification is called for here when workers income is compared with owner income they are not equal here, for the simple reason that the owner has many pits in which number of workers are employed. His average income is computed on the basis of half the share from all the workers together. By implication if worker's
income is Rs.71,817 while the owners income is Rs.5,87,345, it means eight workers are engaged in that particular pit.

In Shahapur taluk workers are paid piece rate wages. They earn 7,08,400 rupees for production of Parcy and Rs 4,76,000 for production of Bandi. 8 worker respondents have been considered for this and the average income of these worker comes to Rs 1,49,382. Sorapur is again exhibiting a agriculture tenency type relationship so that income is shared between owner and worker. The worker in Sorapur gets lowest income ie Rs 36,650. Gulbarga taluk strangely gives highest income to the workers for Parcy and Bandi income. The average annual income per worker is Rs 1,46,575. Chitapur and Sedam again stand apart from others because of their lions share. Worker here gets substantial income from Parcy (Rs 39,14,250) and from Bandi (Rs 5,19,000 ). The average income here is Rs 1,65,529. As usual Sedam is the leader from the point of view of workers income too. Parcy and Bandi bring to the workers Rs 42,05,375 and Rs 5,36,775 respectively. The average income to the workers after taking into account income from other quarry outputs, works out to be Rs 1,79,439. Chincholi though a small taluk yields an average income to the workers of the order of Rs 1,02,396. Thus it can be seen that income to the worker in the entire district, on an average is Rs 1,36,614.

The analysis of income to the workers in all the seven taluks of district reveals that Sedam and Chitapur are at the top, while
Sorapur is at the bottom. In descending order, Sedam has Rs. 1,79,439, Chitapur Rs 1,65,525, Shahapur Rs 1,49,382, Gulbarga Rs 1,46,575, Chincholi Rs 1,02,396, Jevargi Rs 71,817 and Sorapur Rs 36,650. When compared with the owner's income, Shahapur and Gulbarga inter change their positions.

13. The quarry work in different talukas depends upon weather condition. Normally work is stopped in rainy season. Even after rainy season a month or two are required for the area to become fit for quarry work. Since rainfall is not uniform in all taluks it affects the period of quarry work. In addition, workers stop work to attend social and cultural obligations like marriages, festivals, religious fairs, pilgrimage etc. 46% of respondents opined that quarry work would last for six month in a year. Another 40% said that it would go up for 8 months. Only 14% report is that work would go up to 10 months, of course that would be only in Sedam and Chitapur.

14. An inquiry as to why the worker took up quarry work, revealed the facts that 50% of the workers have taken up quarry work for the reason that it yielded them higher income, while, for 38% of the workers, quarry gave them more employment, and 2% took up quarry work in the absence of any alternative work.

15. The quarry work is of equal concern to workers. With exhaustible nature of the resource in the quarry, with growing demand for it, due to higher standard of living, growing population and ever increasing aspirations of the people, the natural resource is in the danger of rapid exhaustion. The workers in this district
have given different opinions on this issues, 43% of the workers expressed the fear that the resource would be exhausted very soon, an equal percentage of the workers (43% ) are quite optimistic. They have no fear of exhaustibility in another 500-600 years. And it is also found that the workers are not properly educated about the exhaustibility and sustainability of resource.

As regards the environmental impact of quarry work, 91% of the workers felt that no harmful effect were produced either on flora or on fauna by quarry work. As opposed to mining, quarrying work does not go deep in to the earth as to expose dangerous and toxic gases, hence it has no environmental damage.

**Conclusion in a Nutshell :**

Quarrying is an important activity in Gulbarga district. It is concerned with exhaustible resources. Nature has given stone formation over millions of years and these are now extracted and shaped in different forms to meet the consumer requirements. Keeping in view the object set for the research the study has analysed the nature of quarrying activity in Gulbarga district. It has analysed the kinds of stone material extracted from earth, and it has examined the types of relationships that exist between workers and owners in quarrying industry. Two types of relationship are explained, viz., i) agricultural tenancy type, and ii) factory type. The study has amply evidenced that the quarrying industry provides an average employment for about eight months in a year. The lowest period is six months and highest is ten
months in a year depending upon the existing weather conditions. It is found that the people engaged in quarrying activity earn a substantial income which places them far above the poverty line. The average income of a pit owner is Rs. 23,95,016/- that of a worker employed in it is Rs. 1,36,614/-. Both the owners and workers do not seem to be aware of the exhaustibility of resource. This is because of the fact that they think that what has been used up in the last 100 years or so is just a “tip of the ice burg.” They do not seem to think of its exhaustibility even in the next five to six hundred years. The study also has indicated that the people engaged in quarrying activity do not think of any environmental hazard due to quarrying activity.

The study has helped to accept the first and the second hypotheses (H₁ and H₂) i.e., it has established the fact that “The people engaged in quarrying activity are not aware of the ultimate impact of exhaustibility of resources on living standard of people, and it has also proved that the people engaged in quarrying activity are also not aware of the environmental impact of their activity.” The study has rejected the third hypothesis (H₃) that “The workers employed in quarrying activity do not earn sufficient income to lead a decent standard of leaving.” It has also rejected the fourth hypothesis (H₄) viz., “The workers engaged in quarrying activity are exploited by the owners.”

The present study though concerned with exhaustible resources is essentially dealing with socio-economic conditions of
the people engaged in exploiting exhaustible resources. The people employed in this industry mostly belong to scheduled caste and scheduled tribes. This is useful study for the government which is striving its best to ameliorate, the economic and social conditions of the backward communities. It has a policy implications because the quarrying activity can become an important antipoverty programme with substantial income and employment opportunities. The analysis of production income and expenditure in quarrying industry has revealed starting results contrary to the general belief. The industry provides very high income to the owners and reasonably high income to the workers too. However, these are concealed because of apparently poor type of living style found in these communities. The truth of the matter is that due to illiteracy and the strenuous nature of work, much of their income is 'spent on drinking'. Even women labourers are also addicted to it. The evils of drinking are too well known to all. They affect family life, economic well being and prospects of the children coming up. Hence, there is need for attention of social welfare officers and social workers who can persuade these workers to divert their earnings towards improvement of their living conditions and the standard of living. Since the quarry industry is concerned with exhaustible resources, it can not be relied upon as a major source of income in the years to come. This has been as suggested in the R.M.Solow's article referred to in the first chapter, the earnings of the quarry industry should be diverted towards the investments in
human capital or any other reproducible investments, so that these will serve as substitutes for the exhaustibility of resources.

**Suggestions:**

Keeping in view the foregoing analytical frame, and major findings, there are certain measures which may be taken into consideration while making efforts to solve the problems of quarrying industry and to help the quarry workers in Karnataka.

There are many possibilities of improvements which help the quarry workers. As it is found, now, polishing of the stone is not normally done by the workers. If this is undertaken by the worker by some mechanical equipments and through training, it would increase the share of producers in the final rupee paid by the user. There are possibilities of employing machines in the digging work. Mechanisation would reduce the strain of the workers. Generally, once the pit is exhausted it is abandoned as unfit for any use. It can be filled in by a thin layer of soil which would enable floriculture and raising of light crops, even in the face of uncertain rainfall. There is scope for raising revenue to the state by revising the royalty fees, rent etc. A ‘workers welfare fund’ can be created out of the revenues collected from quarrying and the same can be used for providing better housing, medical facility and proper education to the children of the workers, so that the children of the workers need not be considered as backward socio-economically in the next generation.