

Impacts of Stone Crushing Work on the Tribal Labourers of Birbhum District, West Bengal – A Social-Cultural Anthropological Study

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ABSTRACT:

Background: Stone mining and stone crushing industry has an important role to construct buildings, roads, bridges, drains etc. Since the mid-nineteenth century it flourished all over the country. It is estimated that more than 5 lakhs people are engaged in different types of work in this stone crushing industry and most of the units are found at the rural and economically backward areas. Workers around this industry are very poor and suffering from various problems.

Objectives: Objectives of the present study are to throw light on the socio-economic issues around the stone crushing area under study and to seek their health and hygiene Status in this environment.

Methods: A descriptive cross-sectional study design has been done to complete the present study. The study has been done among the 100 families who were engaged with different types of activities in the stone crushing industry. The primary data have been collected through Census schedule and Questionnaire along with Case study, Direct Intensive Observation, In-depth Interview. The secondary data have also been used in the present study.

Results: It has been observed that 18% people are engaged with stone carrier work, 15.71% people are engaged with stone breaker work. Only few people 9.71%, 1.43% and 0.86% are engaged with labeller, Khalashi, and Dumper driver respectively. Agricultural work has also been found among the studied population in very low quantity (1.71%). It has been also observed that 33.13% workers were used face cover while working in the industry. Various types of health problems are being observed among the workers of this industry. Among those health problems, 14.71% people were suffered from asthma in different times which is the result of dust and air pollution.

Conclusion: It is concluded that stone crushing and stone mining industry both has harmful effects on the workers in the area under study. They did not maintain proper hygiene due to low education rate, lack of awareness and economic problems.

KEYWORDS: Stone mining, Stone crushing, dust particles, Hygiene, Stone breaker, Social- cultural issues.

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I. INTRODUCTION:

Stone mining and stone crushing industry has an important role to construct buildings, roads, bridges, drains etc. Since the mid-nineteenth century it flourished all over the country in the world. It is estimated that more than 12,000 stone mines and stone crushing units are present in all over India and more than 5 lakhs people are engaged in different purposes in this industry and most of the units are situated at the rural or economically backward areas. (M. Padhy, et. al., 2020)

Stone crushing units have been set up in different regions in India. Birbhum district in West Bengal is one of them. Stone quarry business was first started in Rampurhat block in 1960s decade by Shri Santi Kumar Jain. In the adjacent area of Rampurhat like, Baropahari, Chandannagar, Aranda are also thriving with stone quarrying and stone crushing industry (Nasrin and Sekh, 2016). Most of the tribal people in the study area are depending on this field. Tribal people mainly depends on natural resources ingredients for their daily living. Apparently, in this particular study area most of them are directly or indirectly depends on stone crushing unit or stone mining unit as a labour. As we know that stone crushing unit or stone mining unit both are highly dusty area and the surrounding area is also dusty for breaking stone also. The stone crushing industry is dividing two main sectors, one is stone quarrying or stone mining sector and the other is stone crushing sector. In stone quarrying or stone mining sector is fulfil with some specific procedures, like- drilling of stone beds, blasting the

stone beds with the help of dynamites, carrying out the stone chunks with the help of truck or lorry and finally transportation of blasted big chunks to the crusher sector. As well as the other stone crushing sector is fulfil with some processes. The stone crushing sector is also divided with two ways, one is the bigger stone chunks are broke down with big iron made hammer at first and then the medium pieces of stone chunks further broke down by another labour and finally make it different shapes of stone chips. The other stone crushing process is, the bigger stone chunks are carrying out with the help of clipart bulldozer and then the stone chunks are put down on the vibrator crushing machine. This machine break down the big stone chunks and make different shaped stone chips. Generally, with this vibrator stone crushing machine provide four types of stone chips viz, 4 cm, 2 cm, 1 cm and rubbish. The broken different sizes stone chips are carrying out through the star shaped conveyor belts from the vibrating crushing machine. And finally those stone chips are loading into the truck for transportation. The indigenous people are closely involved in the whole process of stone mining or crushing unit as a worker or day labourer. The surrounding environment both the stone mining unit and stone crushing unit is highly dusty. Those dust particles are encircled the surrounding area and polluted their natural environment as well as habitat to a great extent. Dust particles are simultaneously damaging the vegetation also. All of known that stone dust particle is a primary aerosol and it is released directly from the source of stone mining and stone crushing units. It has also changes every time the soil pH level and damaging productivity of all natural resources like- water, wild lives, vegetation etc. Most of the tribal people who are directly or indirectly involved in the stone crushing unit are suffering from respiratory disease, eyes problem and skin diseases (Sheikh et al., 2011). The present study has been done among the Santal people who are working in stone crushing industry. The housing condition of the workers are mud builder and thatched with straw. In most cases, every houses have a kitchen outside from their living room. Apart from every family has not toilet facilities and most of the households are without safe drinking and proper sanitation facilities (Kapasia and Roy, 2019). Socio-economic pattern of the studied people has been conducted in the present study. Apart from this how they live while working in this industry have been also found by this study. Governmental facilities are present in their society and the present study has been discovered how they get those facilities and how they felt by this facilities.

II. AIM AND OBJECTIVES:

The aim and objectives of the present study are:

1. To throw light on the socio-economic issues around the stone crushing area under study.
2. To seek their health and hygiene processes with this environment.
3. Lastly, to find out the Governmental and non-governmental intervention through the facilities on them under study.

III. METHODOLOGY:

Both the primary and secondary data have been utilized in the present study. The primary data have been collected through structured questionnaire, schedule, intensive interviewing, case study, observation. Both the qualitative data and quantitative data have been collected by applying schedule and questionnaire and interviewing method. Some case studies have been taken from the participants like, eye accident, living problem and stone crushing worker. Purposive sampling method has been applied to choose the studied subject. Photographic methods were used to collect data about the surrounding environmental condition and to collect their living pattern also. In some cases of data collection, telephonic method has been also used to collect some relevant information regarding this study from the participants. The secondary data have been collected from social media, journals, books etc. All the data have been analysed through Microsoft Office Excel.

IV. RESULT AND DISCUSSION

Results of the present study have been mentioned below in tabular form.

Table 1: Distribution of Primary Occupation among the Studied Population.

Primary Occupation	Age Group							%
	10-19Y	20-29Y	30-39Y	40-49Y	50-59Y	60Y<	Total	
Agriculture			2	2	2		6	1.71
Dumper driver			1	2			3	0.86
Household worker	11	19	15	9	17	17	88	25.14
Khalashi		2	2	1			5	1.43
Labeller	8	11	9	3	3		34	9.71
Stone breaker	6	14	18	12	5		55	15.71
Stone carrier	5	20	18	17	3		63	18.00
Others	7	3	2				12	3.43
Nil	72	9	2	1			84	24.00
Grand Total	109	78	69	47	30	17	350	100

The table 1 shows the primary occupational status among the studied population. The lower age group and higher age group of the primary occupational status are 10years and 60years respectively. The highest percentage of the workers is engaged with household work and generally both married and unmarried female members are come into this category. After that 18% people are engaged with stone carrier work, 15.71% people are engaged with stone breaker work. Only few people 9.71%, 1.43% and 0.86% are engaged with labeller, Khalashi, and Dumper driver respectively. Agricultural work has been also found among the studied population in very low quantity (1.71%). They are generally engaged with stone crushing work and they are not the owner of the land. For this reason only few members are engaged with agricultural work and they generally grow seasonal crops like paddy, wheat, Potato etc. Apart from these few people are going to other types of work like seasonal labour, mason, bonded labour etc. And their percentage is only 3.43%. They generally go for others work due to low wages in stone crushing industry, health issues and so on. It can be also said from the above table that 24% people are engaged with any work because they are generally either from lower age group (below 18 years) or higher age group (60 and above).

Table 2: Distribution of Family Income and Expenditure among the Studied population

Income &Expenditure Category	Family Income	%	Family Expenditure	%
3000-5000	54	54.00	54	54.00
5000-10000	44	44.00	45	45.00
>10000	2	2.00	1	1.00
Total	100	100.00	100	100.00

Table 2 shows the monthly family income and expenditure among the studied population. Highest percentage (54%) family income is belonging to the monthly income category 3000-5000 and lowest percentage is 2% only that are belong to above 10000 categories. Similarly, highest percentage (54%) family expenditure is belonging to the monthly expenditure category 3000-5000 and least percentage (only 1%) is belonging to above 10000 categories.

Table 3: Distribution of the family monthly savings status

Monthly Savings (Rs)	No. of Family	Percentage(%)
50	46	46.00
100	10	10.00
200	26	26.00
300	11	11.00
500	2	2.00
No Savings	5	5.00
Grand Total	100	100.00

Table 3 shows that the monthly savings status among the studied families. Most of the families (46%) deposit 50 rupees as their monthly savings in various institutions like bank, LAMPS, SHG etc. Apart from this 26%, 11% and 10% families deposit 200, 300 and 100 rupees as their monthly savings respectively. Since they are poor people and their wages is too low, they cannot save huge amount of money for their future. It can be also said from the above table that few families (5%) cannot deposit any money for their future. Basically they are living in a hand to mouth conditions. It is also worth mentioning that they cannot buy food for their family members.

Table 4: Distribution of the Types of Institutions of the Savings

Types of Institution	No. of Families	Percentage (%)
Bank	8	8.42
LAMPS	9	9.47
SHG	64	67.37
SHG and Bank	14	14.74
Grand Total	95	100.00

Types of institution of monthly savings have been showed by the table 4. A large number of families (67.37%) deposit money as their monthly savings in various SHG for their future. whereas only 8.42% and 9.47% families keep their trust on various Banks and LAMPS respectively. The interesting fact is that 14.74% families have been found who deposit their money in both SHG and Bank as their monthly savings. People generally prefer SHG for better facilities like availability, interest, and easy process of savings. On the other hand only few people chose bank and LAMPS as their monthly savings institution just because of long distance and hard process.

Table 5: Distribution of the Toilet Facility among the Studied Population

Toilet Facility	No. of Family	Percentage
NO	53	53.00
YES	47	47.00
Grand Total	100	100.00

Table 5 indicates the toilet facility among the studied families. Here 53% families have not any toilet at their house and for this reason they have to go to the open field for their toilet. It is noteworthy that they are belonging to very poor families and they do not have sufficient money to take toilet facilities from the local Panchayat, because, to get a toilet they have to be paid a certain amount to their local member of the GramPanchayat. This table also shows that 47% families have toilet facilities and they used it every day. It is

also notable that when they go to their working place, mainly female workers get the toilet facility at their working place and they used soil or ash to clean their hands instead of soap after complete the toilet.

Table 6: Distribution of the Sources of the Drinking Water

	Tube Well	Tap Water	Grand Total
No. of Families	62	38	100
Percentage (%)	62.00	38.00	100.00

Table 6 shows that the sources of drinking water facilities among the studied population. Most of the families (62.00%) were used tube well water for their drinking purpose. Every family have not tube well but they always go to their neighbour's tube well to bring their drinking water. In some cases, they took drinking water from the local deep tube well which were provided by the Government through local Panchayat. On the other hand, a few number of families (38.00%) were used Tap water for their drinking purpose which were provided by the Government. In every hamlet the Local Panchayat provided a tap water facility for their drinking or household purposes.

Table 7: Distribution of the Sources of the Water for Household purpose

	Tube Well	Tap Water	Pond	Well	Total
No. of Families	47	28	9	16	100
Percentage (%)	47	28	9	16	100

Table 7 reveals that distribution of the sources of water for household working purpose. It has been observed that 47 families out of 100 families have own tube well at their house. A small no of families (9) are using water form pond for their household work purpose. Tap water connections have been also found among the studied families. It has been observed that 28 % families are using water from tap water connection. Well is one of the main sources of the water and 16% families are still using water from the well.

Table 8: Distribution of the Types of Health Problem among the Studied Population

Types of Health Problems	No. of Individuals	Percentage (%)
Cold and Cough	39	11.71
Fever	58	17.42
Asthma	49	14.71
Eye Irritation	35	10.51
Skin Problem	23	6.91
Tuberculosis	59	17.72
Body Pain	41	12.31
Jaundice	29	8.71
Total	333	100.00

Various types of health problems are being found among the studied families. Tuberculosis and fever is one of the prime health issues found among the studied population and their percentage is 17.72% and 17.42% respectively. Asthma patients (14.71%) have been also found tremendously among the studied population. The main reason of the health problems tuberculosis and asthma is excessive dust particles and air pollution. Eye irritation (10.51%) is also a result of dust particles. Apart from these health issues like body pain and jaundice have been also found among the studied population and their percentage is 12.31% and 8.71% respectively. More or less everyone suffer from the body pain due to excessive hard work at the work place. Skin problems like itching and rashes have been also found among the studied population and their percentage is 6.91%.

Table 9: Distribution of the Treatment Preference among the Studied Population

Treatment Preferred	No. of Individuals	Percentage (%)
Traditional	120	36.04
Modern	213	63.96

Total	333	100.00
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Table 9 shows the distribution of treatment preference. Both traditional and modern healthcare systems have been used by the studied population. It has been found from the above table that 63.96% people chose modern healthcare system. They trust on the modern healthcare system due to quick resolve of the health issues and easy availability of medicines. On the other hand less no. of individuals among the studied population are depend upon in traditional healthcare system. Basically it has been observed that when the individuals suffer from very common health issues like fever, abdominal pain, cough, skin rashes and eye irritation then they first go for the traditional treatment.

Table 10: Distribution of the Usages of Sanitary Napkin among the Female Members

Sanitary Napkin Usages	No. of Female Members	Percentage (%)
Yes	53	31.55
No	115	68.45
Total	168	100.00

Table 10 shows the usages of sanitary napkins by the studied female members. Only 31.55% female members are use sanitary napkin. They have to buy from the shop. They do not get by free of cost from either their work place or any institutions. On the other hand a large no. of female members is not using any sanitary napkins. Basically they are unaware about the usages and advantages of sanitary napkins. Shyness is one of the prominent reason of not using sanitary napkins. During field survey the female members informed that they do not get sanitary napkins from either ASHA or ICDS.

Table 11: Distribution of the Usages of Various Safety Kits during Work

Safety Kits	Yes	Percentage (%)	No	Percentage (%)	Total
Face Cover	53	33.13	107	66.87	160
Hand Gloves	37	23.13	123	76.87	160
Cap	78	48.75	82	51.25	160
Shoes	21	13.13	139	86.87	160
Spectacles	16	10.00	144	90.00	160

Table 11 shows the usages of various types of safety kits while working at the stone crushing industry. All values and percentages have been calculated among the total 160 workers who engaged in stone crushing industries. Only 33.13% tribal workers use face cover while working. Use of face cover is very important in these stone crushing factories in order to avoid to entering the dust into the lungs. Apart from this 48.75% tribal workers use cap or sometimes cover their head with a piece of cloth in order to avoid deposit of dust on their head. On the other hand only 23.13%, 13.13% and 10.00% people use hand gloves, shoes and spectacles respectively while working at the factories. It is worth mentioning that the owner of the stone crushing industries '*khadan*' do not provide them any kinds of safety kits to their workers. Although in few stone crushing industries the owner provides various kinds of safety kits to their workers in every year. The workers of these industries never buy any types of safety kits due to lack of money and sometime awareness also.

Table 12: Distribution of the Benefits provided by the Government

Governmental Benefits	Yes	Percentage	No	Percentage (%)	Total
Widow Pension	14	14.00	86	86.00	100
Oldage Pension	18	18.00	82	82.00	100
Kanyasree	23	23.00	77	77.00	100
Yubasree	5	5.00	95	95.00	100
SabujSathi	43	43.00	57	57.00	100
Indra Awash Yojona	11	11.00	89	89.00	100
Nirmal Bangla	9	9.00	91	91.00	100
ICDS	63	63.00	37	37.00	100
ASHA Facility	71	71.00	29	29.00	100

Table 12 informed the distribution of various types of governmental facilities which are available for the studied tribal workers at the stone crushing industries. Here few general governmental schemes have been mentioned in the above table like Widow Pension, Oldage pension, Kanyasree, Yubasree, Sabuj sathi, and so on. The table value has been calculated on total 100 families. It has been clearly observed that ICDS facilities are well available among the studied families. Maximum families (63%) avail this facility and they are very happy with this facility. ASHA facility and Sabuj Sathi facility is also find extensively among the studied family. Most of the family members are well satisfied by the facility of ASHA and Sabuj Sathi project. Many families among the total 100 studied families constructed house after getting the benefits from both Indra Awash Yojana (11%) and Nirmal Bangla (9%) projects. Aged people (more than 60 years) and widow female members also get old age pension and widow pension respectively by the governmental projects. Many young girls (23%) also get the benefits of the governmental project Kanyasree, although no. of Yubasree beneficiaries (5%) is very low which may need to increase for development of the young boys.

Stone crushing industry is very much significant in our society. Many people accept this industrial work as their primary occupation although the wages are very low. Workers always devoted themselves in this industrial work to get money. Tremendous hard work brings various health issues among the workers like Asthma, body pain, jaundice, eye problem etc. Excessive dust is the main reason for eye irritation and asthma. They generally prefer modern treatment system rather than traditional healthcare system. Government facilities are available among them. To support the above statements few case studies have been mentioned below.

Crushing worker eye accident- A case

The information regarding the eye accident has been taken from Ameli Soren, a 32 years old woman who residing at the *Chandannagar* village of *Banior* Grampanchayat of Nalhati-1 block. When asked her to her eye accident, she told that when she worked in a crusher unit as a stone carrier, that accident has been happened that time. That was three years before from the present time and that time she was only 29 years old. Through the queries she also told that how the accident was happened with her. When she carried out the filled stone basket and throws down to the vibrator crusher machine, a single piece of stone chip suddenly back and injured to her left eye. Extreme bleeding had happened that time. Other worker gathered together and took her to the local doctor immediately. The doctor bandaged her eye for primary treatment with some medicines as if her apparent bleeding had stopped. The doctor suggested her fellow worker to take her to the Suri General Hospital immediately. She returned home from the hospital after being treated about 10 days. The doctor of this hospital told her, she lost her left eye for rest of her life. The owner of the crusher promised to pay her Rs. 50000 as compensation for loss of her eye. But the owner had just paid Rs. 25000. She did not get any governmental economic support yet for loss of her eye.

Stone Breaking- A Case:

According to Manoj Murmu, a 30 years old stone breaker who residing at *Chandannagar* village of *Banior* Grampanchayat of Birbhum district. Through the present researchers inquiries he told that when he was 21 years old, he joined to the crushing unit as a stone breaker. At that time his families' economic condition was very bad after his father death. Then he decided that he should something to do for his family. Then he joined Maa Tara Stone crushing unit. At that time his daily wages was too low (Rs. 100/day). According to him, every day he started his work at 8 am to 4 pm. The big chunks of stone carried out by a lorry from the *khadan* and put down to the crusher unit. Then he broke down those big stone chunks and made a medium shaped stone chunk. When he broke down the stone chunks, some stone chips were came running down to his body and scrapped there. But in spite of he did not used any protection on his hand, head, legs, and eyes. Through the present researchers questions he also told that the crusher owner did not provide him any protective kits (like, hand gloves, face musk, sunglass, foot ware etc.). He also told that when he broke down those big chunks of stone, sometimes blisters were appeared on his hand. He did not get proper medical treatment from his work place. Now his daily wages is 180 rupees per day but it is not sufficient to making his family blessed. Nevertheless, he is still struggling to survive with this work.

Stone chips labelling- A Case:

Babudhan Murmu, a 33 years old labelling labour who is residing at *Chandannagar* village of *Banior* Grampanchayat of Birbhum district. When the present researchers asked him about his work details, he told that when he was 20 years old, he joined to the crusher unit as a stone breaker, but now he worked as a stone chips labelling work to the crushing unit. Every morning at 8 am he start his work and it continued up to 4 pm. There is a lunch interval from 1:30 pm to 2:00 pm in the afternoon. According to him, he works there as a labelling worker of stone chips into the lorry for transportation. When stone chips were put down to the lorry, he labelling those stone chips from every side as well as corner with a shovel. When he label those stone chips, some dust particles were enters his nose, mouth and eyes. For this he wear a towel (*Gamchha*) veiling as a mask.

Sometimes he was suffering shortness of breath and some eyes problem. He also told us that he knows that those dust particles are harmful for him but there is nothing to do. The crusher owner did not provide them any mask or dust protective kits like helmet hand gloves etc. only the owner provides him shoes. Through the questioning it also revealed that his daily wages is Rs. 150 per day. The crusher is closed every Sunday.

Stone carrier- A Case:

Paniful Murmu, 35 years old woman is residing at village *Chandannagar* of *Banior* Grampanchayat of the Birbhum district. Through the present researcher questioning, she told that last 10 years she worked this job at a stone crushing unit. When she got married, her family income was too low and that's why she chooses to do that job in her local stone crusher unit. Now her daily wages is 180 rupees per day. Every day morning at 8 am she start her job and at 4 pm she ends this as a stone carrier worker in the stone crushing unit. When she reached to the crusher, at first she takes a basket and a head turban. The turban (*pagri*) was made with a cut part of *shari*. She tied the turban tightly around her head with a string, it would not come off. Another labour picked up a basket full of stones on her head and she throw down the stones with using both of her hands into the crusher machine. They do not use any mask or hand gloves or any other dust particles protection kits when they do this work. She also told that they occasionally suffer from various ailments like, cough, fever, itching problem, eye irritation etc. but they have do this work for their survivals. The owner of their stone crushing unit does not provide any medical facilities to them.

Dumper driver- A Case:

Ajit Soren, a 32 years old dumper driver who is residing at *Chandannagar* village of *Banior* Grampanchayat of Birbhum district. According to him, he is doing this work from last 8 years. Every day in early morning at 7 am he joined to the work and up to 2 pm he continued it. His work is the loaded big stone chunks after blasting to the *khadan* carried out by a lorry and he is actually work as a driver. The big stone chunks are carried out by a lorry and reached to the different stone crushing units of that area. His daily wages is 250 rupees. Work is closed only on Sunday because the *khadan* as well as the crusher units both are closed at this particular day in every week. Occasionally he suffers from various physical problems like, eye irritation, itching problem, cough and cold, fever etc. He drinks local alcohol (*haria*) every day, because he believed that it is the only remedy for him to relief his mind and body also.

V. CONCLUSION

Stone crushing industry is very much important in our society. Generally various sizes stone for construction work is being made by this industry. This industry's work is one of the major income sources for many people. Tribal people are one of them. The present study has been done among the Santal tribe of Rampurhat, Birbhum, West Bengal. Majority of the workers belong from the Santal tribe. Total 100 Santal families have been covered under the present study. Various types of works have been performed by the workers of this industry like stone breaker, dumper driver, stone carrier and so on. Both male and female members are engaged with this industrial work. Gender biasness has not been seen in this industrial work. Child labour has not also been found during field survey. It has been observed that the wages of the workers are very low and as a result they are living in a hand to mouth condition. It is worth mentioning that the wages are not same among the workers and the average wages of the workers is Rs.180/day. Agricultural work has been also found among the studied population. Apart from this many young boys and aged people go for other works like mason, seasonal labour etc. Their monthly family income is not so good. Most of the family's monthly income is 3000-5000. On the other hand it has been also observed that many families' monthly income more than 5000 and less than 10000. Only few families' monthly income was more than 10000. It has been observed that the families whose monthly income is around 10000, in those families' more than two family members engage in various works. Monthly savings has been observed among few families and basically they deposit their money in SHG, LAMPS and Banks for their future life. Their monthly savings are very low due to lack of very small income. Toilet facilities are available among many families and the people go to open field for their toilet who has not own toilet at their home. Tube well is the main source of drinking water to them. Apart from this few families use tap water for their drinking purpose. On the other hand tube well, tap, pond and well is the main source of water for the household purpose. Various types of health problems like tuberculosis, body pain, fever, asthma etc have been found among the studied families. Body pain, asthma, tuberculosis are occurred massively among the studied people. Basically they prefer modern healthcare facilities rather than traditional healthcare practice. It has been observed that all women are not using sanitary napkin due to lack of awareness, not availability, and lack of money. It has been also observed that workers of the stone crushing industry use various types of safety kits while working. Those safety kits are includes face cover, caps, spectacles etc. Safety kits are not provided by the industry rather the workers have to buy from the market. Governmental facilities like Indra

Awash Yojona, ASHA, ICDS, Nirmal Bharat etc. have been available for them among the studied population. And they are well satisfied with this facilities.

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