

The Socio-Economic and Health Impacts of Coal Mining on Local Community: A Case Study of Talcher Coalfield, Odisha

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ABSTRACT

Since long time unscientific, haphazard mining and over exploitation has started giving negative result to both the environment and local community. Now time has come for an in-depth study of the social and environmental development of the coal field and the surrounding area. The coal field and the local community required immediate attentions for sustainable and eco-friendly mining. If the present situation is allowed to continue it will bring a marked decline in mining and associated activities. And the area may become deserted barren land in near future.

In this research paper an attempt has been made to study and assess the socio-economic and health impacts of coal mining on local community, along with that different Suggestion for sustainable mining presented in this research paper. So that, the need for eco-friendly mining can be realized and further steps can be taken accordingly.

Key words: Coal Mining, Jagannath, Kalinga, Hingula, Lingaraj, Talcher

INTRODUCTION

Coal Mining is one of the core industries which contributes to the economic development of a country and undoubtedly brings wealth and employment opportunity in the area. But simultaneously leads to extensive environmental degradation which in turn has an adverse hazardous impact on the health condition of workers working in the coalmines as well as the people residing near the colonies. Odisha is a state endowed with various types of mineral resources. If coal is taken into consideration; Odisha has highest

coal reserves in India. It has two coal fields i.e. Talcher coal field and Ib valley coal field comes under Gondwana formation having total reserve of (71.45 BI), as per GSI estimate on 1.4.2012. Talcher coal field is one of the oldest and largest coal fields of the country, i.e. spread up to 1500 sq. km area. At present 07 no of open cast and 03 no of underground coal mines comes under Talcher coal field with in 05 administrative areas i.e. Jagannath, Kalinga, Hingula, Lingaraj, Talcher. All the above mines are being operated by MCL, a subsidiary of CIL.

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The present study aims at getting an insight into the impacts of mining and finding out different remedial measure. Needless to mention all mining activities have differential impacts on local communities, though its intensity and magnitude varies. In such cases the most vulnerable community is the mining community those they are living proximity to mines. Though mining activities affects every aspect of life of local community some important aspects like socioeconomic and health aspects are taken into consideration in this research work.

The specific objectives of the study are, to assess the impacts of mining on the socioeconomic status of the local community and to examine impacts of mining activities on the health status of local communities.

MATERIALS AND METHODS

The sample survey is being conducted covering about 10% households from each village belonging to different caste groups, occupation groups and land size Groups to make it approximate to a stratified sampling method. Altogether 14 villages have been identified, out of those 4 villages within 5 km buffer and 10 villages are within

10 km buffer. The data on the socioeconomic profile is being collected as considering Adiministrative composition of study area, literacy profile and occupation composition, health system, water facility ,Communication facilities, Land us pattern and Recreational facilities.

The study area covers 10 km radius covering 04 blocks of Anugul district. Talcher, Kaniha, Chhendipada & Banarpal. The cluster of coal mines leases area i.e. Ananta, Jagannath, Balanda and Bharatpur open cast mines.

3.1 Administrative composition of the study area

In the study area total 149 rural settlements are there out of which 40 settlements are with in 5km core and 109 rural settlements are 10 km buffer from which 10% sample villages has been selected i.e. 4 revenue villages Taken from core area and 10 revenue villages Taken from buffer area .Thus total 14 sample villages from the study area taken in to consideration in this research work for which census information are available in town and villages directory (primary census abstract during 2001 and 2011).

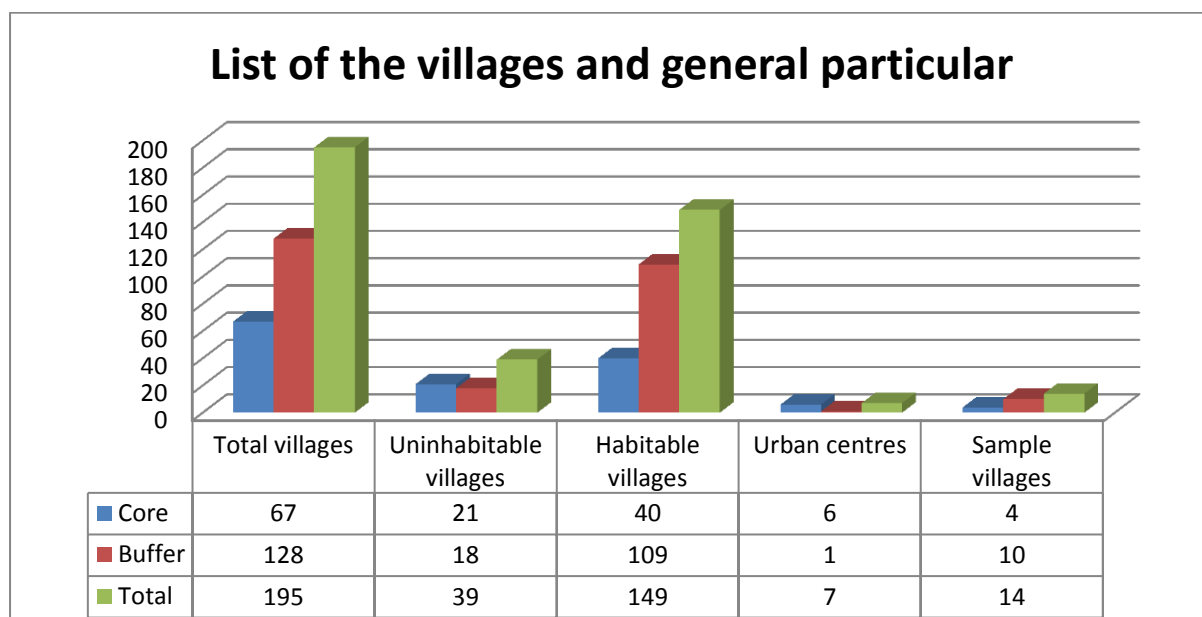


Fig. 1: List of the villages and general particular of the study area

On the basis of these information a general profile if the region has been presented in

table-1 of the 14 villages 4 are core area villages and 10 are buffer zone villages.

Table 1. Number of sample household to be surveyed from different sample villages

General Profile of the sample Villages						
	Name of the villages	District Head Quarter (Name)	District Head Quarter (Distance in km)	Nearest Statutory Town (Name)	Nearest Statutory Town (Distance in km)	No of sample HH from
A	CORE					
1	Dasarathipur	Anugul	34	TALCHER	4	6
2	Telepasi	Anugul	17	ANUGUL	17	6
3	Jamubahali	Anugul	15	ANUGUL	15	24
4	Solada	Anugul	16	ANUGUL	16	84
TOTAL						120
B	BUFFER					
1	Bhajanipur	Anugul	25	TALCHER	5	5
2	Chandrasekharpur	Anugul	27	TALCHER	20	8
3	Badajharan	Anugul	10	ANUGUL	10	4
4	Khirkolipasi	Anugul	7	ANUGUL	7	5
5	Madanmohanpur	Anugul	34	TALCHER	5	9
6	Badahar	Anugul	50	TALCHER	40	12
7	Mallibandha	Anugul	17	ANUGUL	17	15
8	HariharpurRayati	Anugul	46	TALCHER	16	19
9	Brajanathapur	Anugul	39	TALCHER	10	28
10	Gopalprasad	Anugul	20	ANUGUL	20	55
TOTAL						160
GRAND TOTAL						280

3.2 Literacy profile of the sample villages

The education profile of the sample villages reflects that the total literacy rate of all the sample villages has grown (17.54%) over decade which is (22.42%) in buffer zone and (12.36%) in core zone. The rate of literacy was

(62.23%) according to 2001 census which has increased to (65.69%) in 2011 census. The rate of literacy in the study area indicate that it is far below than the state literacy rate which is (74%) according to 2011 census.

Table 2. Literacy profile of the sampling villages

Literacy Profile of the Villages										
Sl. No.	Name of the Village	Literacy in the year 2001			Literacy in the year 2011			%age of increase/ decrease of literacy		
		Literacy rate	Male Literacy rate	Female Literacy rate	Literacy rate	Male Literacy rate	Female Literacy rate	Total	Male	Female
A	CORE									
1	Dasarathipur	71.79	60.71	39.29	60.53	56.52	43.48	-17.86	-23.53	-9.09
2	Telepasi	65.2	59.46	40.54	72.36	56.74	43.26	20.27	14.77	28.33
3	Jamubahali	72.33	66.52	33.48	68.73	57.74	42.26	-11.48	-23.16	11.75
4	Solada	61.23	61.95	38.05	64.42	56.86	43.14	23.86	13.67	40.44
TOTAL		64.58	63.24	36.76	65.77	57.07	42.93	12.36	1.4	31.22
B	BUFFER									
1	Bhajanipur	100	100	0	84.44	60.53	39.47	533.33	283.33	0
2	Chandrasekharpur	0	0	0	39.39	76.92	23.08	0	0	0
3	Badajharan	28.57	64.71	35.29	39.88	56.72	43.28	97.06	72.73	141.67
4	Khirkolipasi	35.83	65.67	34.33	63.96	47.89	52.11	111.94	54.55	221.74
5	Madanmohanpur	74.86	54.15	45.85	65.17	54.96	45.04	-5.42	-4	-7.09
6	Badahar	62.86	63.64	36.36	76.5	52.04	47.96	45	18.57	91.25
7	Mallibandha	60.98	55.51	44.49	65.25	53.82	46.18	49.58	45.04	55.24
8	HariharpurRayati	69.87	58.93	41.07	76.68	60.66	39.34	-1.72	1.17	-5.86
9	Brajanathapur	67.13	61	39	71.54	58.44	41.56	24.48	19.27	32.62
10	Gopalprasad	54.64	59.59	40.41	58.24	56.7	43.3	16.33	10.68	24.66
TOTAL		60.16	59.55	40.45	65.2	56.84	43.16	22.42	16.85	30.63
GRAND TOTAL		62.23	61.34	38.66	65.46	56.95	43.05	17.54	9.13	30.9

The condition of female literacy is worse in this region i.e. only (43.16%) and male literacy i.e. (56.95%). Out of the 14 sampling villages two village i.e. Chandrasekharapur (39.39%) and Badajharan (39.88%) have very poor literacy rate and one village Bhajanipur (84.44%) has very high rate of literacy. Rest of villages has average literacy.

If a decadal growth rate is taken in to consideration out of the 14 sampling villages 4 villages i.e. Dasarathipur (-17.86%) Jamubahali (-11.48%) Madanmohanpur (-5.42%) Hariharapurayati (-1.72%) have negative literacy growth.

Whereas two village i.e. Bhajanipur (533.33%) and Khirkholipasi (111.94%) have registered very high decadal growth rate of literacy. One interesting thing noticed here the decadal growth rate of female literacy i.e. (30.90%) is far more than the growth rate of male literacy (9.13%).

3.3 Occupation composition of sample villages

The occupational composition of sample villages can be examined from the table number Presented below. If it occupational structure of the local population observed here. The work participation has increased slightly with in a declared (33.82%) in 2001 census increased to (36.19%) in 2011 census.

In the total decadal increase of work population, working population is (19.54%) the percentage of decadal. Increase is very high in core zone i.e. (34.75%) which is very less in buffer zone i.e. (5.38%). Due to agglomeration of mines and mining activity work participant is more in core region i.e. as per 2001 census it is (43.62%) in core zone, where as it is (30.68%) in buffer If the gender

wise work participant is observed it Is very high in case of male i.e. (.54.54%) where as work participant of female is very poor i.e.(16.24%). Different villages have registered dynamic growth rate in working population 4 villages have registered negative growth rate i.e. Jamubahali (-22%), Khirkholipasi (-7%), Badajharan (-25%), Gopalaprasad (-22%) and the rest of villages have registered positive growth rate in working population i.e. Bhajanipur (100%), Chandrasekharapur (75%), Badajharan (82%) and Brajanathpur (69%).

3.4 Health system of the sampling villages

The health infrastructure of the sampling village are not satisfactory out of all 14 sampling villages only two big villages i.e. Solada and Gopalaprasad has 1 dispensaries each again the dispensaries are not having sufficient medical facility. The sampling village move more than 15- 20 km Gudibandha CHC for health care service and sampling villages developed upon 3 PHC i.e. Goplaprasad, Kalamchuin and Kaniha and move to 10-20 km to arrival health care from PHC. The First ad center are found close to villages Goplaprasad and Solada. In the above two villages chemist stores are also found within the village. The ambulance facility of the sampling villages also quite worst, non of the nearby hospital near to sampling villages having ambulance facility. It is available at a distance of (15-20km) away from the sampling villages i.e. at Gudi Bandha CHC, KANIHA, GOPLAPRASAD and Kalamachuin PHC, sub divisional hospital TALCHER, SATABADI NEHRU HOSPITAL by MCL etc. The health facility is not much found improved as no noticeable improvement of numbers of health facility centre.

Table 3. Health facilities of the sampling villages

HEALTH FACILITIES										
SI No.	Name of the Village	Distance of The Villages From Health Center(in KM)						Distance of the Chemist Store from village in km	Ambulance Available in nearest Hospital	Time takes to Travel nearest Health Provider in min
		CHC	PHC	HOSPITALS	DISPENSERIES	FIRST AID CENTER	OTHERS			
A	CORE									
1	Dasarathipur	c	c	b	c	c	b	5	No	15
2	Telepasi	c	c	c	c	c	c	4	No	15
3	Jamubahali	c	c	c	c	b	c	2	No	10
4	Solada	c	c	c	l	a	a	0	No	10
TOTAL										
B	BUFFER									
1	Bhajanipur	c	b	b	b	c	b	2	No	5
2	Chandrasekharapur	c	b	c	c	c	b	5	No	30
3	Badajharan	c	b	b	b	c	b	4	No	30
4	Khirkolipasi	c	b	b	b	c	b	5	No	20
5	Madanmohanpur	c	b	b	a	c	a	2	No	20
6	Badahar	c	c	c	c	b	b	4	No	30
7	Mallibandha	c	c	c	c	b	b	3	No	20
8	HariharapurRayati	c	c	c	c	b	b	2	No	10
9	Brajanathapur	c	c	c	b	b	b	1	No	20
10	Gopalprasad	c	c	c	l	a	a	0	No	5

**If not with in the village the distance code: (a for < 5 Kms, b for 5-10 Kms and c for 10+ kms).

People of sampling villages travels to the nearest health care center to avail medical facility. Different sampling village located at different distance from health care center so the travelling time to healthcare center also varies i.e. Gopalprasad, Bhajanipur, Solada, Hariharapur Rayati, take maximum (5-10km) to travel to health center where as Chandrasekharapur, Badajharan, Badaharan these villages are far away from medical facility and it takes more than (30-40) min to travel to reach the health care center.

3.5 Water sanitation facility of sampling villages

The water facility of sampling villages is satisfactory. Village the Bhajanipur and

Badaharan have draining water problem, i.e. they only depends upon well for the both drinking water and bathing water. Other sampling villages are satisfactory i.e. (Gopalprasad, Solada, Jamubhali) provided with over head take by MCL so they are able to get the supply water. The water problem provided in the month of summer as the land become dry and the water level of tube well go deep down.

The other time villages are dependents upon the pond and canal for bathing water. Maximum households have their own tube well so the water facility of the sampling village is satisfactory.

Table 4: Water, sanitation facilities of the study area

WATER, SANITATION FACILITIES				
SI No.	Name of the Village	Sources of Water	Whether Common Drainage Facility Available(Y/N)	Disposal of Solid Waste Material Facility (Y/N)
A	CORE			
1	Dasarathipur	P,W	N	N
2	Telepasi	P,T,W	N	N
3	Jamubahali	P,T,W	N	N
4	Solada	P,T,W	N	N
TOTAL				
B	BUFFER			
1	Bhajanipur	W	N	K
2	Chandrasekharapur	P,W	N	N
3	Badajharan	P,W	N	N
4	Khirkolipasi	P,W	N	N
5	Madanmohanpur	P,W	N	N
6	Badahar	W	N	N
7	Mallibandha	T,W,O	N	N
8	HariharapurRayati	T,W,O	N	N
9	Brajanathapur	T,W	N	N
10	Gopalprasad	P,T,W,O	N	N

**Y-Yes, N-No , P-Pond, T-Tank, C-Canal, W-Well, O-Other

3.6 Communication facility of sample villages

Table 5. Communication facility of the study area

COMMUNICATION FACILITIES										
SI No.	Name of the Village	Communication Facilities			Available of Service					
		Nature of Roads	Condition of Roads	Distance of the Villages from nearest surface Road in km	Bus	If not available distance from village	Railway	If not available distance from village	Public Carrier/auto/taxi	If not available distance from village
A	CORE									
1	Dasarathipur	K	B	2	N	a	N	b	N	a
2	Telepasi	P	G	1	N	c	N	c	N	b
3	Jamubahali	P	G	0.5	N	b	N	c	Y	
4	Solada	P	G	2	N	c	N	c	Y	
TOTAL										
B	BUFFER									
1	Bhajanipur	K	B	0.5	N	a	N	a	N	a
2	Chandrasekharapur	P	G	3	N	b	N	c	N	c
3	Badajharan	P	G	4	N	b	N	b	N	a
4	Khirkolipasi	P	G	3	N	b	N	b	N	b
5	Madanmohanpur	P	G	1	N	a	N	b	Y	
6	Badahar	P	G	0	Y		N	c	N	c
7	Mallibandha	P	G	2	N	c	N	c	Y	
8	HariharapurRayati	P	G	1.5	Y		N	c	N	a
9	Brajanathapur	P	G	1	N	c	N	a	N	a
10	Gopalprasad	P	G	0	Y		N	c	Y	

**If not with in the village the distance code: (a for < 5 Kms, b for 5-10 Kms and c for 10+ kms),(K-Kachha,P-Pakka,G-Good,B-Best)

The communication facility of the sampling village is well developed except two sampling villages i.e. Dasarathipur and Bhajanipur all the villages are well connected with the pakka concerted road. Only two villages have kachha road. And the condition road is not good. It distance of the sampling villages from nearest surface road taken in to consideration most of the sampling villages within 1-2km away from surface road. Some villages i.e. Goplaprasad and Badaharan Jamubhali ,Bhajanipur have surface meted road with in the villages.

Some other sampling village i.e. Goplaprasad and Badaharan, Jamubhali, Bhajanipur have surface meted road within the village. Some other sampling village i.e. Chandasekharpur, Badajharan and Khirakholipas I around 3-4 km away from the nearest surface road. Bus facility is available only in sampling village i.e Badaharan, Hariharapur Rayati and Goplaprasad.

Public carrier (auto/taxi) facility available in 5 sampling villages i.e. Jamubhali, Solada, Madanmohanpur, Malibandha and Goplaprasad. Rest of the villages' dependence upon nearest village for bus and taxi. Facility which is available within the distance of 10-15km. For the railway facility the entire sampling village depended upon Talcher railway station or anugul railway station which is approximately 10-20 km away from sampling villages.

3.7 Land use Patten of sampling villages.

The total geographical area of all the Sampling villages is 3102(hector) out of which sum of area of 4 sampling villages of core is 1261 ha and sum of the area of 10 sampling villages of buffer is 1841 (hector) among the sampling villages Dasarathipur is the smallest in terms of area having 16 ha and SOLADA is 951 ha that is the largest among sampling village.

If the land use pattern of the sampling villages is taken in to consideration.

From the above data of the sampling village it is clear over a period of decade

- ❖ Forest land use has been increased from (22% to 33%).
- ❖ Nun agricultural land has been increased from (20% to 21%).
- ❖ Clulturable west land has been decreases from (11% to 10%).
- ❖ Unirrigated land has been decreases from (38% to 32.95%).
- ❖ Irrigated land has been decreases from (7.16%) to (2.62%).

And the interesting thing notice here out of all 14 sampling villages only 2 villages i.e. Chandrashekpur and Badajharan have irrigated facility. Rest of villages is unirrigated. It is notice from land use data the % of forest area is more in core zone.I.e. 52.86% which is far more than forest land cover buffer zone i.e. only (19.60%).

The land use data reflect that %of nun agricultural area is more in core i.e.(25.52%) because of mining agglomeration in core area. This is comparatively less in buffer zone i.e. (18.00%).The non irrigated area % is less in core i.e.(16.35%).This is comparatively more in buffer zone i.e. (44.32%).

3.8 Recreational facility of sampling villages.

The recreational facility of sampling village is quit poor. None of the villages having cinema hall or community hall facility. All those sampling villages dependent upon Augul district hall which is about (10-20km) away.

The youth of the village spend time by playing football, cricket, watching TV etc. so there is need of development of community hall and provide them recreational facility.

Table 6. Recreational facilities, fuel and energy facilities

RECREATIONAL FACILITIES, FUEL AND ENERGY FACILITIES								
Sl No.	Name of the Village	Recreational Facility			Fuel and Energy facility			
		Cinema Hall(Y/N)	Village communit Center(Y/N)	Other Sources of Entertainment in the Village	Electricity (Y/N)	Street Light (Y/N)	Sale of Coal in the village (Y/N)	Sale of Wood in the village (Y/N)
A	CORE							
1	Dasarathipur	N	N	CA,CR,TV	Y	N	Y	Y
2	Telepasi	N	N	CA,CR,FO,TV	Y	N	Y	Y
3	Jamubahali	N	N	CA,CR,TV	Y	N	Y	Y
4	Solada	N	N	CA,CR,FO,TV	Y	N	Y	Y
TOTAL								
B	BUFFER							
1	Bhajanipur	N	N	CA,CR,TV	Y	N	Y	Y
2	Chandrasekharpur	N	N	CA,CR,TV	Y	N	Y	Y
3	Badajharan	N	N	CA,CR,FO,TV	Y	N	Y	Y
4	Khirkolipasi	N	N	CA,FO,TV	Y	N	Y	Y
5	Madanmohanpur	N	N	CA,CR,FO,TV	Y	N	Y	Y
6	Badahar	N	N	CA,CR,TV	Y	N	Y	Y
7	Mallibandha	N	N	CA,CR,FO,TV	Y	N	Y	Y
8	HariharpurRayati	N	N	CR,FO,TV	Y	N	Y	Y
9	Brajanathapur	N	N	CA,CR,FO,TV	Y	Y	Y	Y
10	Gopalprasad	N	N	CA,CR,FO,TV	Y	Y	Y	Y

**CA- Cards,CR- Carrom, FO- Football, TV- Television, Y- Yes, N-No.

Except Brajanathpur and Gopalprasad. These two village provided streetlight by MCL where MCL colonies are there.

Sale of fuel wood and coal is common in the entire sampling village. The price of cement bag of coal is 100 Rs and the gunny bag of coal is 400 Rs in different area. The coal supply to water defends mall resale industry and for households use.

CONCLUSION

Now time has come for an in-depth study of the social and environmental development of the coal field and the surrounding area. The coal field and the local community required immediate attentions for sustainable and eco-friendly mining. The above survey reports states the inferior quality in some trends and some improvement in others. If the present situation is allowed to continue it will bring a marked decline in mining and associated activities and the area may become deserted barren land. This inconvenience not only hampers the local ecosystem, it will affect local community to local biodiversities. Therefore it is essential to strike a balance between mineral development on one hand and

restoration of environment and local society on the other.

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