

Socio-Economic Profile and Quality of Life Index of Sample Households of Mining Areas in Talcher and Ib Valley Coal Mines in Orissa

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ABSTRACT The paper presents the socioeconomic profile of the people around proposed mining areas of Mahanadi Coalfields Limited at Talcher and Ib valley coal mine areas to generate base line data for future intervention. The Quality Of Life (QOL) has also been indexed in a 0-10 point scale based on some important value function like occupation, caste and land ownership. The overall quality of life index based on the value functions ranged from 2.93 (very poor) to 4.12 (poor) with overall average score of 3.27. Thus these localities are infrastructurally backward and people's access to economic resources and modern amenities has been very low. Therefore, while making an Environmental Management Plan, the authority of Mahanadi Coalfields Limited should also lay emphasis on providing infrastructure facilities to the locality and to enhance the quality of life of the people.

INTRODUCTION

Industrialization is an important component of development process, a sign of modernization and represents multifaceted and multi-dimension spheres of influence. Coal Mining Projects not only serve the major objective of generating power, which is an essential ingredient of broad principle of Industrialization and serve the national interest, it also influences the local economy in various ways. Like any other industrial project, it paves the way for development of infrastructure and generation of market forces. The possible impact on the local economy can be transformation of the traditional economy activities resulting in withdrawal of labour force from agriculture and engagement in the construction of roads and buildings. At the same time it can provide infrastructure facilities such as road, electricity, education, health and sanitation etc. through their Local Area Development Plan in addition to modernization of agriculture through the availability of electricity and rise in the level of agricultural productivity. Thus, in the process of establishment of Project and after its operation, there is development of several infrastructure facilities. In sum, these developmental projects are likely to enhance the income generation capacity, employment opportunities, scope for trade and commerce and increase in the overall quality of life of the people living in the vicinity of

the project. Studies on socioeconomic profile have been made by Kumar (1996) for West Bokaro Mining Complex and Prusti (1996) for Jharia Coalfields. Work on the concept of quality of life grew out of the social indicators movement of the 1960s (Day and Jankey, 1996) and investigators started using a social indicator approach to define what QOL meant to them. However, subsequently many researchers adopted both subjective and objective approaches to assess QOL based on wide literature on the subject (Erikson, 1993). Sheykhi (2006) made an extensive sociological study of Quality of Life by examining the fertility behaviour from a multidimensional perspective. Echevarria-Usher (1999) equated health, in its fullest and multicultural connotation, with wellbeing or quality of life. Understanding of QOL needs exploration of relationship between various components-economic, biophysical, socio-cultural and political – to arrive at the priority determinants of health and wellbeing (Forget and Lebel, 2001). Noronha and Nairy (2005) adopted participation process, case histories, biomedical health analysis and spatial and environmental analysis in developing a Quality of Life tool.

METHODOLOGY

The present study was based on survey conducted in proposed mining area in Ib valley and Talcher Coalfields of Orissa. The survey aims

to document the living conditions, level of socio-economic development of the region and the socioeconomic profile of people in the core and buffer zones of the proposed mining area. The survey was organized to collect information on socio-economic variables at the village level as well as household level. The village level data are collected from revenue offices, Panchayat office, Censuses while the household level data are collected through questionnaire method. The sample survey was conducted covering about 20 households from each village belonging to different caste-groups, occupation-groups and land size-groups to make it approximate to a stratified sampling method. The sample survey was conducted covering about 367 households from different villages in Talcher coal mines and Ib Valley coal mines of Mahanadi Coalfields Limited with a population of 3448 in the core zone and, while in the buffer zone the population is found to be 3720 belonging to 737 households. Besides making an analysis on aspects of living conditions and socioeconomic profile of the locality, an attempt has also been made to analyze the quality of life Index for different villages in the proposed mining areas.

Quality of Life Index in Mining Areas: The Quality Of Life index (QOL) has been computed for the sample households following the methods adopted by Saxena et al. (1998). The index has been modified to suit to the present investigation because of the variation present in the data. The parameters taken into consideration for the assessment of Quality of Life of the respondents have been listed in Table 1. The scores used to assess the Quality of Life have been presented in Table 2.

RESULTS

Socio-economic Profile of Sample Households

Demographic Composition: The demo-

graphic composition of sample households can be examined through their demographic particulars such as sex-composition, average family size and caste composition as presented in Table 3. It is noticed from the table that the sex-ratio is 81.62 per 100 male population indicating that composition of population has a bias in favour of male population. The average family size stands at nearly 5. The sex ratio indicates that migration tendencies are weak in the region.

Caste Composition: Out of the 367 households 80.10% belonged to General Caste, 11.71% to Scheduled Caste and 8.17% to Scheduled Tribe. The important tribal groups in the region are Kora, Bhuiyan and Khond. The tribal have been rehabilitated through various employment, income and asset generating programmes.

Occupational Pattern: Of the total households 35.69% belonged to Cultivator group, 14.4% combining cultivation with labour, 26.4% depending on hiring out of labour, 3.26% depending on business, 8.17% are service holders and the rest 11.98% depending on other occupations.

Land-Ownership Pattern of Sample Households: It is noticed that nearly 14.7% belonged to landless category, 50.68% owning less than 2 acres, 24.79% owning between 2 to 5 acres and the rest 9.80% owning above 5 acres. The percentage of irrigated area is 15.73% in case of sample households. One notices that higher the ownership area higher is the extent of irrigation.

Analysis of Variables constituting the Quality of Life Index

Literacy status of Sample Households: The level of literacy is around 57.15% for whole population, while the male literacy rate is 69.50% and female literacy as low as 42.01%. There exists variations in literacy status so far as occupation groups are concerned. Highest male literacy is

Table 1. Parameters used for the computation of the Quality of Life index.

i. Housing (Type & Number of room)	viii. Transport and communication facilities
ii. Source of Water used	ix. Fuel and energy availability
iii. Sanitary facilities Available	x. Assets possessed
iv. Food and nutrition intake	xi. Own transportation means
v. Health and safety status	xii. Per-capita income
vi. Educational status	xiii. Recreational facilities
vii. Medical facilities	

The minimum desired level of score for the above parameters for a fair living condition was defined with a value of 0.5 on a scale of 0 to 01. All the parameters have been given an equal weightage and the total score of QOL Index is 13. The classification on the basis of total score used for analysis is as follows: 1. <3 -Very poor, 2. >3-5-Poor, 3. >5-7-Fair, 4. >7-10-Good, 5. >10-13-Very good

Table 2: Method used for the assessment of Quality of Life Index

<i>Parameters considered</i>	<i>Values assigned</i>	<i>Parameters considered</i>	<i>Values assigned</i>
1. Housing		2. Source of Water	
Pucca -3 rooms	0.5	Tube wells or own wells	0.5
Mixed ->5 rooms	0.5	Village well	0.3
Kachha - > 10 rooms	0.5		
Lower and higher values are assigned according to availability of rooms		For additional own source of water higher value is assigned	
3. Sanitary Facilities		4. Food Type	
No facility	0	Good(Rice+Pulses+curry)	0.5
Proper facility	0.5	Moderate (Rice+pulses+ GLV)	0.3
For additional facilities higher values are assigned		Poor (Rice+ Onion+GLV)	0.1
		Higher values area assigned as per availability of non-vegetarian foods and other protein foods.	
5. Roads and Transport Facilities		6. Vehicles Possessed	
Good roads, bus and railway service	1.0	Cycle	0.3
Good roads and proper bus facilities	0.75	Scooter/ motor cycles	0.5
Only railways and bus facilities	0.5	Four wheelers	> 0.7
7. Prevalence of CommonDiseases		8. Medical Treatment Facilities	
Suffering from Common diseases	0.3	No availability of medical facilities	0
Suffering from No major diseases	0.5	Doctor	0.2
No diseases	1.0	Dispensaries	0.5
		Doctor + specialization	0.8
		Doctor + Dispensary	1.0
9. Fuel and Energy Used		10. Entertainment	
Coal + electricity + Gas	1.0	Only TV	
Coal + electricity	0.75	TV + Cinema	
Coal	0.5	Cinema + Community recreations	
Wood + coal	0.3	TV+ Cinema+ Community	
Wood	0.2		
11. Assets Possessed Amounting to		12. Educational Qualification	
Rs.< 10,000	0.2	Illiterate	0
Rs.10,000-30,000	0.35	< Matriculate	0.3
Rs.30,000-50,000	0.5	Matriculate	0.5
Rs.50,000-1 lakh	0.75	Higher education	0.7
Rs > 1 lakh	1.0		
Rs. < 1000	0.2		
		13. Per Capita Income per Month	
Rs. 1000-1400	0.3	Rs. 2300-5000	0.6
Rs. 1400-1800	0.4	Rs. 5000-10000	0.7
Rs. 1400-1800	0.4	Rs. 10000-20000	0.8
Rs. 1800-2300	0.5	Rs. 20000 above	0.9

Table 3: Demographic composition of sample households

<i>Total number of Households Surveyed 367 with total family members (1769)</i>					
	<i>Number</i>	<i>%</i>		<i>Number</i>	<i>%</i>
1. Sex			5. Caste		
Male	974	55.05	General Caste	294	80.11
Female	795	45.95	Scheduled Caste	43	11.71
Total	1769	100.0	Scheduled Tribe	30	08.18
			Total	367	100
2. Sex-ratio		81.62	6. Land-OwnershipPattern		
3. Average Family Size	4.82		Landless	54	14.71
4. Occupational Status			0-2 acres	186	50.68
Cultivator-	131	35.7	2-5 acres	91	24.79
Cultivation & labour	53	14.5	Above 5 acres	36	09.82
Labour	97	26.4	Total	367	100
Business	12	03.3	7. Irrigation Pattern		
Service	30	08.2	Total no. of households having	39	12.46
others	44	11.9	own land with irrigation facilities		
			0-2 acres	20	10.45
			2-5 acres	13	14.45
			Above 5 acres	6	15.73

noticed for Business and Service class and lowest for Labour Class. Female literacy is also found highest for Service class but lowest for Business & Labour group (Table 4). Caste-group-wise one notices higher male as well female literacy in case of General caste and lowest in case of ST (Table 5). Size group-wise there is higher male literacy in case of middle size groups and lowest literacy rate in case of Landless category. Female literacy rate is found to be highest for high land size group and lowest in case of landless (Table 6).

Health Care Facilities: Availability of health services at the village level were seen through existence of hospitals, dispensaries, first-aid centres and availability of doctors/practitioners (Table 7). The medical facilities through hospitals, dispensaries and health aid centers are almost non-existence in most of the villages. However, private medical practitioners are available in 9 sample villages.

Housing, Water Availability and Sanitation Facilities: The availability of water and sanitation facility in different villages from which samples are drawn can be seen from Table 8. The important sources of water common to all the villages are village ponds and wells including

tube wells. Tanks existed in 5 of the 19 villages and canals are found only in 3 villages. It is interesting to note that about 49.86% of the sample households live in Kaccha houses, followed by 23.7% in pacca houses and the rest remaining in mixed type houses. Only about 3% of the households reported existence of sanitary facility at their homes, while 14.4% reported having their houses electrified. Regarding availability of drinking water it is found that most of the sample households reported dependence on own well followed by other sources of water.

Public Transport, Own Transport and Communication Facilities: On the availability of transport facilities it is noticed that Railway network does not touch any of the villages and bus service is available only in two out of 19 villages (Table 9). The survey of sample households reveals that of 367 households 43 households do not possess any means of transport. Of the remaining households 281 are found to be possessing cycles, 41 households possessing motor cycles and only 2 possessing four wheelers.

Recreational Facilities: The recreational facilities available in different sample households are presented in Table 10. It is interesting to notice

Table 4: Literacy status of sample households occupation wise

Occupation	No. of households	Male	Female	Total	Literates		
					Male	Female	Total
Business	12	33	27	60	28(46.67)	4(14.81)	32(53.33)
Cultivator	131	383	273	656	280(42.69)	117(17.83)	397(60.52)
Cult +Labour	53	132	123	255	93(36.47)	56(21.96)	149(58.43)
Labour	97	226	209	435	126(28.94)	67(15.42)	193(44.36)
Others	44	117	92	209	87(41.63)	45(21.53)	132(63.16)
Service	30	83	71	154	63(41.56)	45(29.22)	108(70.78)
All	367	974	795	1769	677(38.27)	334(18.89)	1011(57.16)

Table 5: Literacy status of sample households caste group-wise

Caste groups	No. of households	Male	Female	Total	Literates		
					Male	Female	Total
General	294	779	630	1409	550(39.03)	272(19.30)	822(58.33)
SC	43	117	102	219	81(37.03)	39(17.81)	120(54.84)
ST	30	78	63	141	46(32.62)	23(16.31)	69(48.93)
All	367	974	795	1769	677(38.27)	334(18.89)	1011(57.16)

Table 6: Literacy status of sample households land size group-wise

Land-size groups	No. of households	Male	Female	Total	Literates		
					Male	Female	Total
Landless	54	130	113	243	72(29.63)	33(13.58)	105(43.21)
<2 acre	186	474	412	886	337(38.03)	173(19.53)	509(57.56)
2-5	91	250	190	440	186(42.27)	86(19.55)	272(61.82)
>5	36	120	80	200	82(41.00)	42(21.00)	124(62.00)
All	367	974	795	1769	677(38.27)	334(18.89)	1011(57.16)

Table 7: Health care facilities in the villages of sample households

S. No.	Village	Block	Hospital	Dispensaries	First Aid Centres	Private practitioners
1.	Bhalugadia	Talcher	No	No	No	Yes-1
2.	Pir Khaman	Chhendipada	No	No	No	No
3.	Kankrei	-do-	No	No	No	Yes-1
4.	Chhota Berni	-do-	No	No	No	No
5.	Kaunsidhipa	-do-	No	No	No	No
6.	Kumunda	Talcher	No	No	No	No
7.	Balichandrapur	Chhendipada	No	No	No	No
8.	Natedi	Talcher	No	No	No	No
9.	Badagunduri	Kaniha	No	No	Yes-1	Yes-4
10.	Kansamunda	-do-	No	No	No	Yes-1
11.	Jaypore	-do-	No	No	No	No
12.	Malipasi	-do-	No	No	No	Yes-1
13.	Debbhuin	-do-	No	No	No	No
14.	Jaradanga	-do-	No	No	No	No
15.	Bhuinpur	-do-	No	No	No	No
16.	Masanihata	-do-	No	No	No	No
17.	Rampur	Jharsuguda	No	No	No	Yes-1
18.	Malda	-do-	No	Yes-1	No	Yes-1
19.	Patrapali	-do-	No	No	No	Yes-2

Table 8: Water and sanitation facilities in mining areas (Village-wise)

S. No.	Area	Block	Ponds	Tanks	Canals	Wells	Others
1.	Bhalugadia	Talcher	3	-	2	100	-
2.	Pir Khaman	Chhendipada	2	1	-	40	-
3.	Kankrei	-do-	5	-	-	100	-
4.	Chhota Berni	-do-	-	2	-	13	1 (Jor)
5.	Kaunsidhipa	-do-	1	-	1	5	1(Jor)
6.	Kumunda	Talcher	6	1	-	40	1(Jor)
7.	Balichandrapur	Chhendipada	-	-	-	5	-
8.	Natedi	Talcher	2	1	-	20	-
9.	Badagunduri	Kaniha	2	7	1	250	1(Borewell)
10.	Kansamunda	-do-	2	-	-	100	-
11.	Jaypore	-do-	1	-	-	1	1(Tubewell)
12.	Malipasi	-do-	1	-	-	8	-
13.	Debbhuin	-do-	2	-	-	15	-
14.	Jaradanga	-do-	2	-	-	12	1(Tubewell)
15.	Bhuinpur	-do-	1	-	-	12	-
16.	Masanihata	-do-	2	-	-	70	-
17.	Rampur	Jharsuguda	2	-	-	25	3
18.	Malda	-do-	1	-	-	15	4(Tubewell)
19.	Patrapali	-do-	4	-	-	16	9(Tubewell)

that Theatre no longer forms part of the entertainment avenue of people as revealed by the sample survey. Modern entertainment sources such as TV/Cinema is found among households in 12 out of 19 villages. Most of the households in all the villages reported no specific entertainment programme in their families.

Fuel and Energy Availability: The fuel and energy availability of different sample households indicate that Coal (40%) and wood (38%) constitutes the most important source of fuel among the sample households followed by a combination of wood & coal or only wood. Very few are reported to be using electricity as a fuel.

Income Pattern and Occupation Structure:

The income classification is made into four groups; (i) the low income group is considered to be one with families having per capita income less than Rs.1800/-, (ii) the lower middle group with per capita income between 1800 to 2300/-, (iii) upper middle group consisting of members with per capita income between 2300 to 5000 and (iv) the high income group consists of members with P.C. I of more than Rs.5000/- per annum. The modal income class is Rs.2300-Rs.5000/- PCI (55%) followed by the income class of Rs.5000/- and above (35%). The Per capita average income per annum stands at Rs.4626/-

Table 9: Transportation facilities in villages

S. No.	Area	Bus service	Railway service
1.	Bhalugadia	No	No
2.	Pir Khaman	No	No
3.	Kankrei	No	NO
4.	Chhota Berni	No	No
5.	Kaunsidhipa	No	No
6.	Kumunda	No	No
7.	Balichandrapur	Yes	No
8.	Natedi	No	No
9.	Badagunduri	Yes	No
10.	Kansamunda	No	No
11.	Jaypore	No	No
12.	Malipasi	No	No
13.	Debbhuin	No	No
14.	Jaradanga	No	No
15.	Bhuinpur	No	No
16.	Masanihata	No	No
17.	Rampur	No	No
18.	Malda	No	No
19.	Patrapali	No	No

Consumption Pattern of Sample Households:

The consumption pattern of sample households reveals that a highest proportion of expenditure is spent on food (49), followed by clothes (21%) and other expenditure including Children's education and health care.

Economic Profile of Sample Households:

The economic profile of sample households can be analyzed in terms of land ownership pattern, occupation structure, family income, expenditure, asset particulars, indebtedness and outstanding debt. The economic profile of sample households occupation-wise is presented in Table 11. The

economic profile of occupation groups among the sample households reveals that highest irrigated area is noticed for cultivating class followed by service holders and cultivators combining with labour or other activity, though the level of irrigation is pretty low. Per household income is found highest in case of Service and Other occupation class and lowest for groups depending on labour. The low income of Business class indicates that the families are petty traders. The same pattern is observed in case of other indicators such as expenditure, indebtedness, assets and outstanding debt.

The economic profile of sample households caste groups-wise is presented in Table 12. Caste-group wise one notices highest level of irrigation for general caste and no irrigation in case of SC and ST households. While highest per-household income is noticed for General Caste, it is lowest in case of SC. The same pattern is observed for per-household expenditure, and indebtedness. The SC group, however, has higher value of assets compared to ST. The middle land size groups seem to be possessing highest level of irrigated area. Highest per household income is found in case of top land size-group and lowest in case of low size group. Per-household expenditure is found lowest in case of low size-group and highest in case of top size group. Per-household asset position and indebtedness are found highest for high size group and lowest for landless (Table 13).

Table 10: Recreational facilities in villages and among sample households

S. No.	Area	Block	Theater	TV	TV/cinema	No specific	Total
<i>Core Zone</i>							
1.	Bhalugadia	Talcher	-	1	-	19	20
2.	Pir Khaman	Chhendipada	-	3	-	17	20
3.	Kankrei	-do-	-	2	2	16	20
4.	Chhota Berni	-do-	-	-	-	20	20
5.	Kaunsidhipa	-do-	-	-	-	15	15
6.	Kumunda	Talcher	-	1	5	14	20
7.	Balichandrapur	Chhendipada	-	-	-	16	16
8.	Natedi	Talcher	-	-	-	16	16
9.	Badagunduri	Kaniha	-	3	3	14	20
10.	Kansamunda	-do-	-	-	1	19	20
11.	Jaypore	-do-	-	1	4	15	20
12.	Malipasi	-do-	-	-	2	14	16
13.	Debbhuin	-do-	-	2	1	17	20
14.	Jaradanga	-do-	-	-	3	17	20
15.	Bhuinpur	-do-	-	1	-	19	20
16.	Masanihata	-do-	-	3	-	17	20
17.	Rampur	Jharsuguda	-	1	-	19	20
18.	Malda	-do-	-	2	-	18	20
19.	Patrapali	-do-	-	7	-	13	20
Total			-	27	21	318	367

Table 11: Economic profile of sample households

S. No.	No of households	Owned	Irrigated area %	Per house family income per annum	Per house expenditure per annum	Per house Assets per annum	Per house indebt-edness per annum	Per house outstanding debt per annum
Business	12	15.5	3.22	27400	23046	15042	1750	2167
Cultivator	131	457.5	20.76	20241	17885	18386	2798	2191
Cult+ labour	53	63.3	12.63	12275	12634	7134	1991	2217
Labour	97	57.51	5.56	13754	13665	3058	1165	1186
Others	44	111.4	4.48	38136	25105	12134	6500	6693
Service	30	62.0	14.51	51320	35130	31323	16267	7800
All	367	767.21	15.73	22296	18457	13072	3760	2926

Table 12 : Economic profile of sample households Caste group-wise

S. No.	No of households	Owned	Irrigated area %	Per house family income per annum	Per house expenditure per annum	Per house Assets per annum	Per house indebt-edness per annum	Per house outstanding debt per annum
General	294	774.40	15.56	23929	19624	13853	4087	3109
SC	43	32.92	0.6	15207	12906	11856	791	744
ST	30	29.89	-	16456	14973	7160	4817	4267
All	367	767.21	15.73	22296	18457	13072	3760	2926

Table 13: Economic profile of sample households land-size group-wise

S. No.	No of households	Owned	Irrigated area %	Per house family income per annum	Per house expenditure per annum	Per house Assets per annum	Per house indebt-edness per annum	Per house outstanding debt per annum
Landless	54	0	0	21133	17865	4176	2130	2352
<2 acres	186	164.51	17.2	20846	18901	10204	2392	2438
2-5	91	255.7	37.0	22474	19631	19271	6626	3434
5-above	36	347	12.03	50389	33231	28478	6639	5972
All	367	767.21	15.73	22296	18457	13072	3760	2926

Quality of Life Index (QOL)

On the basis of the value functions stated above the QOL of different sample households were computed and the average QOL for all the sample households is presented in Table 14 . While the average QOL for all the sample households is found to be 3.27, it is highest in case of Service class and lowest for Labour group. It may be noted that the Quality index broadly presents the status of the sample households at a Poor level (as per the gradation of scores mentioned earlier), indicating that not

only the infrastructural facilities are poor in the region but also the individual resource base has been poor resulting in a low Quality of Life index. Although some variations exist among different Occupation groups, none of these indices exceed the poor status. This indicates that life support system has been very inadequate and the social sector development has been at a low level . While the average QOL for all the sample households is found to be 3.27, it is found highest in case of General caste group. Caste group-wise also none of the caste groups exhibit QOL index above the poor status. Land size group-wise one

Table 14: Quality of Life Index of 397 house holds based on occupation,Caste and Land Ownership

Occupation-Wise	Caste-wise	Land Ownership-wise
Business	General	Landless
Cultivation	SC	<2 acres
Cultivation and labour	ST	2-5 acres
Labour	Average	>5 acres
Service		Average
Average		

finds that highest QOL is noticed in case of Top size group and lowest in case of low size group. However even the highest land size group also does not possess a Quality of Life Index above the poor status.

DISCUSSION

Saxena et al (1998) observed 37.25 and 35% of the families in ISM, West Bokaro and Bhowra respectively with a fare quality of living with a maximum of 31% in Good group in ISM and 18-54% in Poor group because of the provision of infrastructure to the locality. The results obtained by Noronha and Nairy (2005) in their study on mining region of Goa suggests that while there is a difference in objective conditions between mining and non-mining regions, there is no difference in satisfying level between the two, except for the environment domain, where people in the mining region report lower satisfaction levels in all facets. The impact the mining has on local people depends on the resource available to and conditions faced by the local people who follow mining activities. The present study assesses the QOL of the people based on the objective and subjective approach in the proposed coal mine areas. It appears that the QOL of people is poor and if mining is to happen, enabling conditions need to be created and put in place to ensure that local communities benefit from the project. Mining activity has to ensure that there is improved quality of Life giving emphasis on the social, environmental and health impacts of mining and the implications of resource demand of mining vis-à-vis the rights and needs of the people.

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