

Fig: 11.4.1 b Haemoglobin Level in Females among various age groups in Study Site & Control Site

***N-represents normal level of Haemoglobin in an individual (Range: 12.5-14.5gms%); ABN- is the level below or above the normal range of Haemoglobin, NT-refers to the people who were not tested**

The above Fig 11.4.1 b represents the haemoglobin level in females among various age groups in both control and study sites. The main reason of anemia is due to improper diet causing nutritional deficiency.

11.4.2 Platelet Count

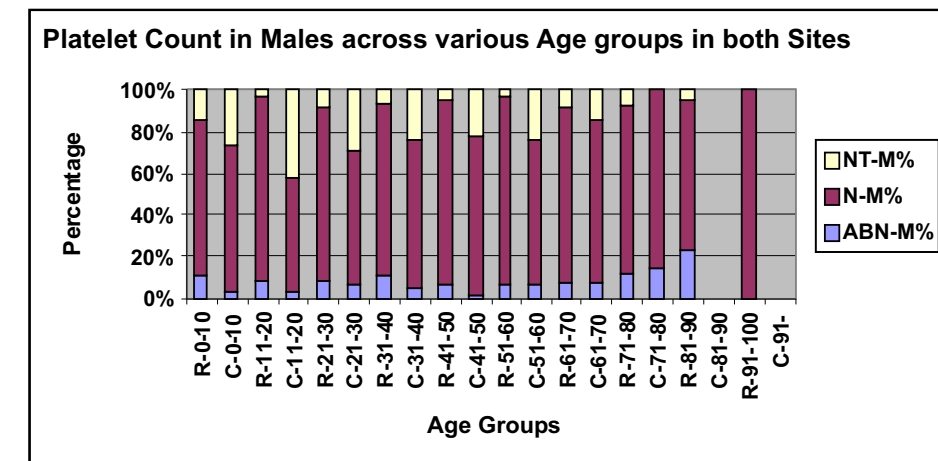


Fig: 11.4.2 a Platelet Count in Males across various Age groups in both Sites

***For Fig 11.4.2 a and 11.4.2 b -- N-represents normal level of Platelet Count in an individual (Range: 1.5-4.0 lac/cu mm); ABN-is the level below or above the normal range ; NT-refers to the people who were not tested**

There was a pathological analysis of blood samples of all attendants at the health camps. Reports were figured out on the basis of Platelet range. Majority had normal Platelet count.

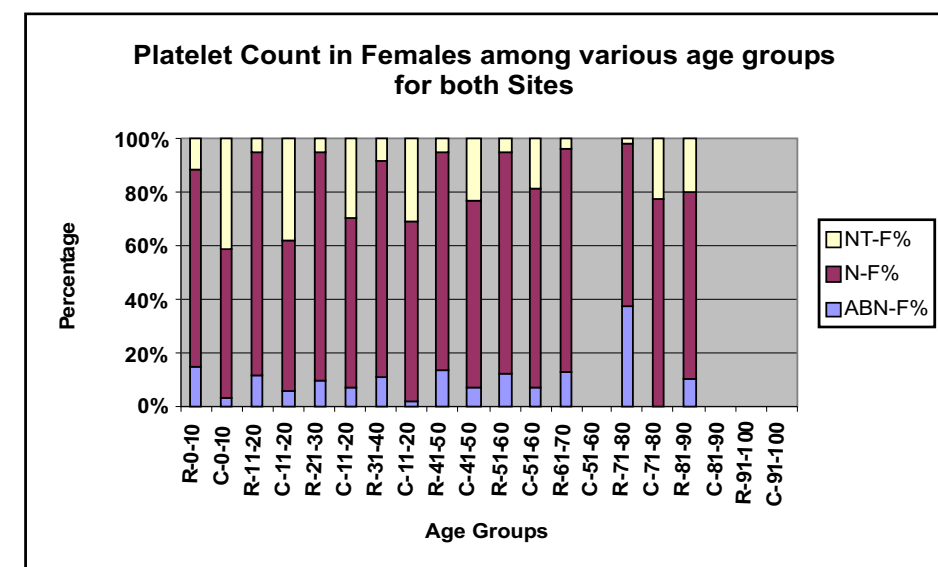
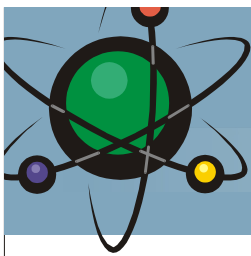


Fig: 11.4.2 b Platelet Count in Females among various age groups for both Sites

Major percentage comes under Normal category for both male & female. Some deviation (ABN) is observed in the age group 71-80 year old females in the study site.



11.4.3 Total WBC Count

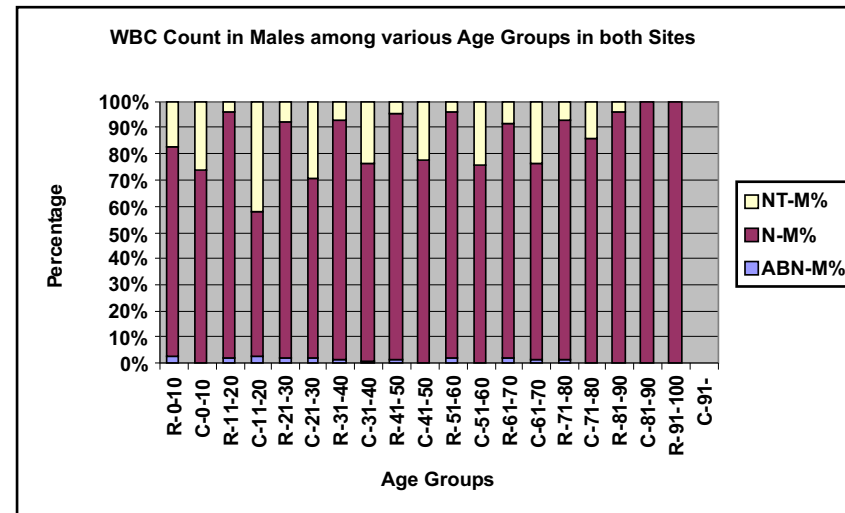


Fig: 11.4.3 a WBC Count in Males among various Age Groups in both Sites

*** For Fig. 11.4.3 a and 11.4.3 b -- N-represents normal level of Total WBC count in an individual (Range: 4000-11000/cu mm); ABN- is total WBC count below or above the normal range; NT-refers to the people who were not tested**

The above stacked bar diagram illustrates that maximum males in both the sites across various age groups were tested for normality. Incidence of above/below normal (ABN) was negligible in both sites.

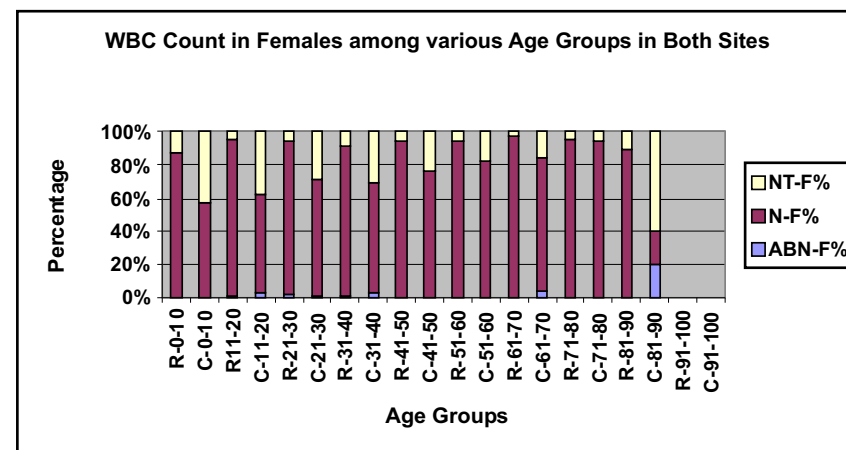


Fig: 11.4.3 b WBC Count in Females among various Age Groups in Both Sites

As tested for the WBC Count most of the females came under the normal range. It is to be noted here that this area is known to be infested with chronic malaria which is evident from the health status survey discussed earlier. In addition, the most common cause of low level of hemoglobin is malnutrition which is prevalent in these areas.

Different WBC Count

Patients attending the health camps in both sites were also examined for different WBC Count by being tested for Neutrophils, Lymphocytes, Eosinophils and Monocytes.

Neutrophils

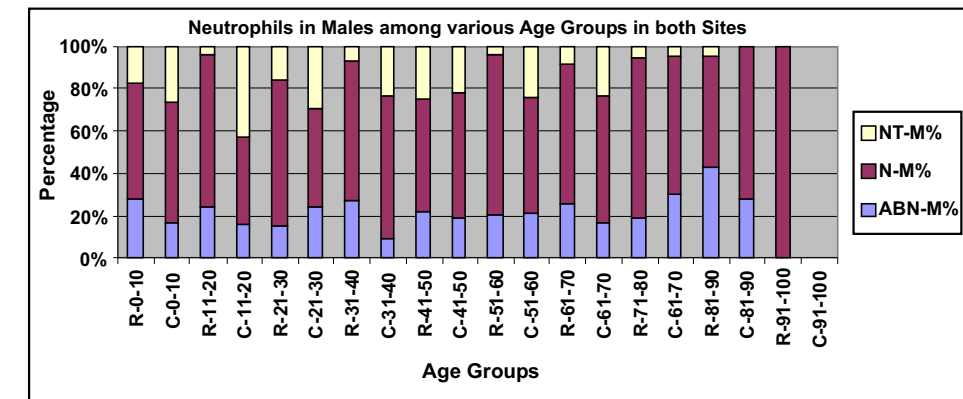


Fig: 11.4.3 c Neutrophils in Males among various Age Groups in both Sites

***N-represents normal level of Neutrophils in an individual (Range: 45-65%); ABN- is Neutrophils below or above the normal range; NT-refers to the people who were not tested**

The above graph reflects that majority in all age groups had normal level of Neutrophils.

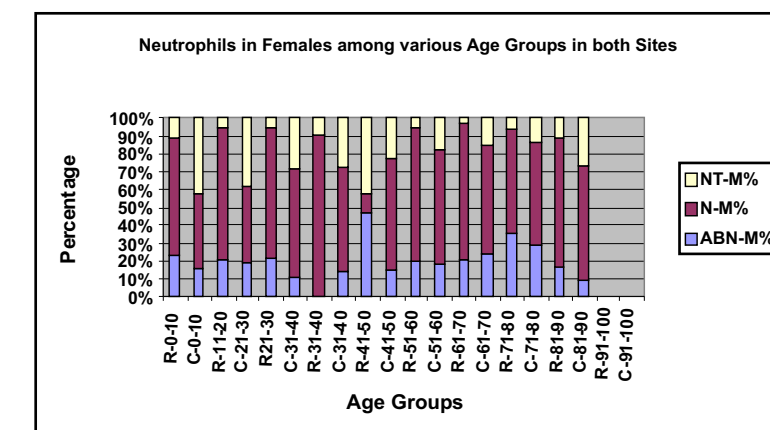
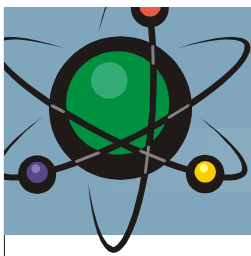


Fig: 11.4.3 d Neutrophils in Females among various Age Groups in both Sites

***N-represents normal level of Neutrophils in an individual (Range: 45-65%); ABN- is Neutrophils below or above the normal range; NT-refers to the people who were not tested**

In both the sites and in all the age groups of males & females the Neutrophils was found to be normal among the majority.



Lymphocytes:

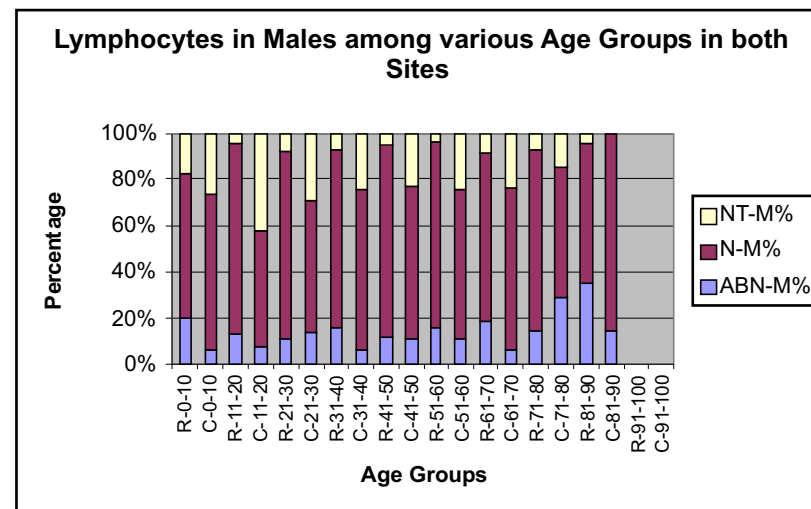


Fig 11.4.3 e Lymphocytes in Males among various Age Groups in both Sites

***N-represents normal level of Lymphocytes in an individual (Range: 20-45%);**
ABN- is lymphocytes below or above the normal range; NT-refers to the people who were not tested

As a whole, major percentage were normal in all age groups.

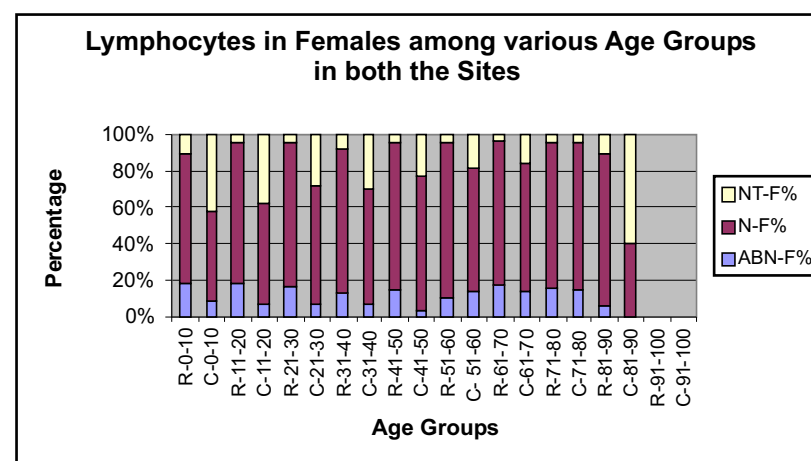


Fig 11.4.3 f Lymphocytes in Females among various Age Groups in both the Sites

***N-represents normal level of Lymphocytes in an individual (Range: 20-45%);**
ABN- is lymphocytes below or above the normal range; NT-refers to the people who were not tested

As a whole, all categories come under normal level of Lymphocytes. While making gender specific comparison in study site, a higher percentage of males fell in the ABN category of lymphocytes.

Eosinophils:

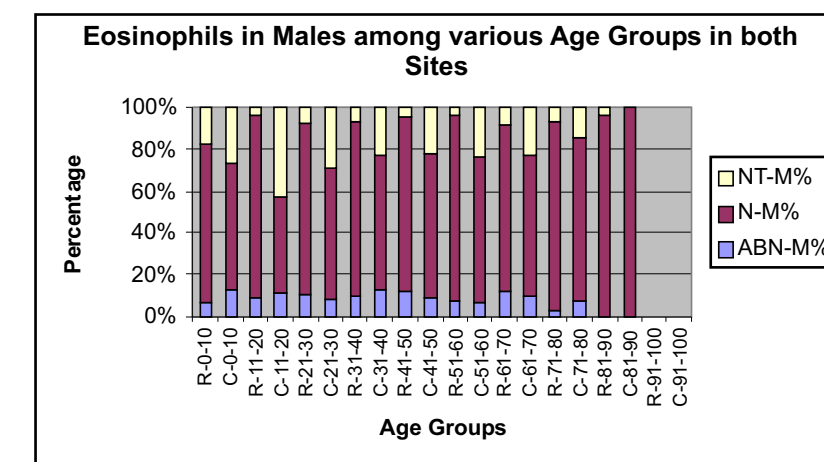


Fig 11.4.3 g

***N-represents normal level of Eosinophils in an individual (Range:01-08 %);**
ABN- is Eosinophils level below or above the normal range; NT-refers to the people who were not tested

Fig 11.4.3g depicts that a relatively higher percentage of males in both groups were normal in the Eosinophils range.

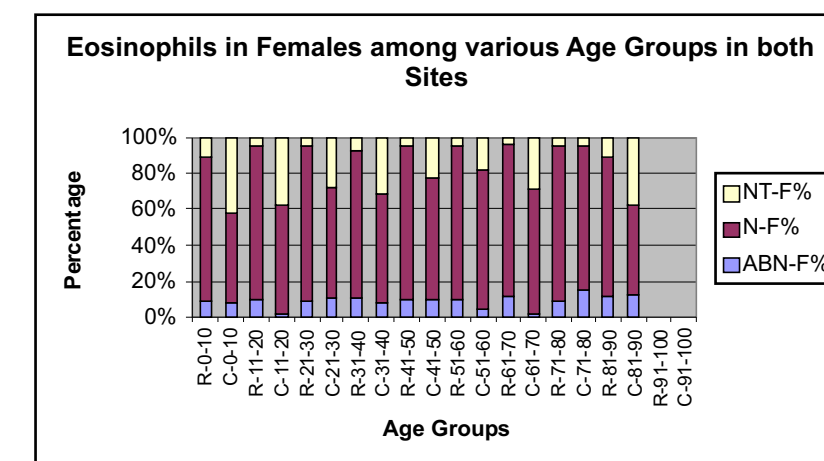
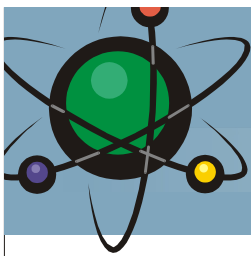


Fig 11.4.3 h

***N-represents normal level of Eosinophils in an individual (Range:01-08 %);**
ABN- is Eosinophils level below or above the normal range; NT-refers to the people who were not tested

Fig 11.4.3 (h): illustrates the normality and abnormality of Eosinophils level in females across various age groups in both sites. A vast majority showed normal level Eosinophils.



Monocytes

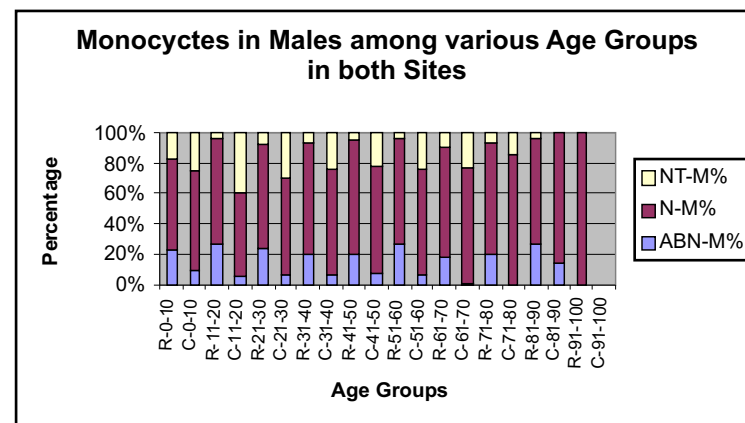


Fig 11.4.3 i Monocytes in Males among various Age Groups in both Sites

***N-represents normal level of Monocytes in an individual (Range:01-04%);**
ABN- is Monocytes level below or above the normal range; NT-refers to the people who were not tested

Vast majority comes under the normal level of Monocytes.

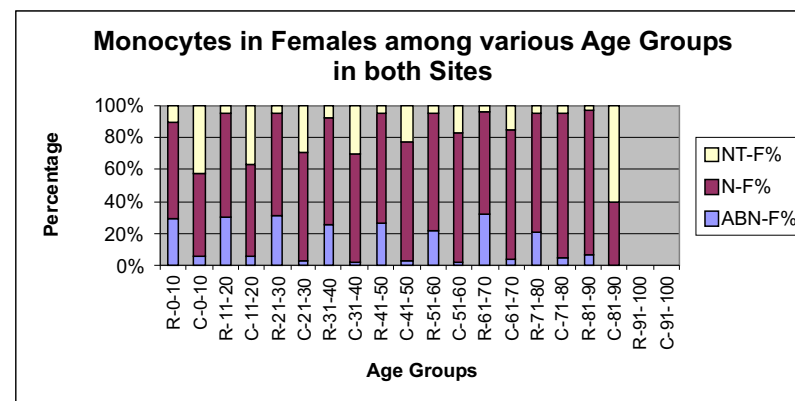


Fig 11.4.3 j Monocytes in Females among various Age Groups in both Sites

***N-represents normal level of Monocytes in an individual (Range:01-04%);**
ABN- is Monocytes level below or above the normal range; NT-refers to the people who were not tested

Majority females show normal level of Monocytes.

12. Pre-operational Background gamma radiation monitoring of three clusters villages surrounding Mohuldih, Banduhurang and Bagjata villages

12.0 Introduction

Demographic and health status surveys, together with medical camps, were conducted in the survey areas during the project duration. The Methodology followed for conducting the survey was of Clustered Random Sampling in which 26 villages were identified in the UCIL's operational area (East Singhbhum district) and further sorted into three clusters namely Banduhurang (Cluster 1), Mohuldih (Cluster 2) and Bagjata (Cluster 3). The primary data for the demographic survey was collected by interviewing the households in the respective villages. A total of 1698, 1221 and 1209 households were interviewed from clusters 1,2 and 3 respectively during the project.

Background radiation data is an important input in any demographic/ health status survey particularly if a hypothesis of incidence of any disease condition and its relation with radiation, if any, is to be tested. Background gamma radiation monitoring survey was therefore taken up in the project to have this data ready at hand for the epidemiological analysis. The survey was carried out with the help of Thermo luminescent Dosimeters (TLDs) at 66 locations in 26 villages in the three clusters of Banduhurang, Mohuldih and Bagjata. Survey meter readings were also recorded during the deployment of TLDs. In addition, the latitude longitude data was also recorded using a standard Global Positioning System (GPS).

12.1 Methodology

Almost all the villages being spread along the central road, three TLDs were deployed in a village typically in the beginning, middle and end of the village. Where the village spread was too small, only two TLDs were deployed. (GPS) was used to record latitude longitudes of each of the location where the TLDs were deployed. All the TLDs were deployed outside the houses to get the outdoor background gamma radiation levels.

CaSO₄: Dy based TLDs, developed by EAD, BARC for environmental gamma radiation measurement were used for the monitoring. Fig. 1 shows a photograph of a typical TLD while Fig.2 shows the survey meter used in the survey. The TLDs were deployed outside of the dwelling units in each village for the period of 3 months and the exposed TLDs were analyzed for exposure received at the location. The values were then annualized to get the annual gamma radiation levels prevalent at the location. Survey meter readings were recorded at each location. Five readings were recorded on each occasion and the average was calculated. GPS coordinates, recorded at each of the locations were later on used for GIS layers of gamma radiation dose levels at various locations in the 26 villages.

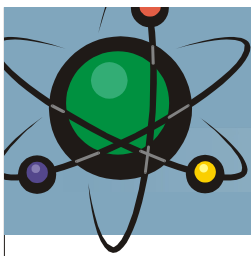


Fig. 12.1: A photograph of a typical TLD used in the environmental gamma radiation levels



Fig.12.2: A photograph of survey meter used in conjunction with the TLD monitoring

12.2 Results and Discussion

1. Banduhurang Cluster:

Outdoor environs of 26 locations in 9 villages in Banduhurang cluster of villages were monitored using the TLDs as described in the previous paragraph. Survey meter readings were also recorded during the survey. Table 1 shows the results of the TLD analysis and those of the survey meter readings. In general, gamma radiation levels at most of the locations were observed to be quite steady. This is seen in the Table 1 in which the last column shows the average reading of 5 survey meter readings. It is seen that the annual gamma radiation levels varied between 0.78-2.0 mGy/a with an average of 1.17 ± 0.37 mGy/a. Fig.12.3 shows the percent distribution of the radiation levels in the cluster. Only 5% locations had radiation level above 2 mGy/a. Overall 95% of the locations in the cluster were found to be less than 2 mGy/a. The highest reading exhibited 2.58 mGy/a.

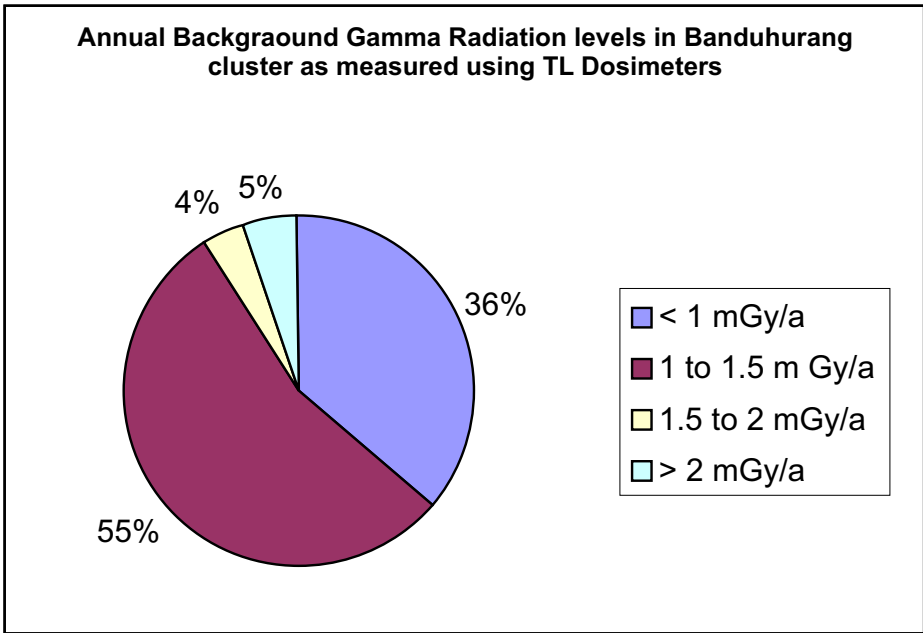
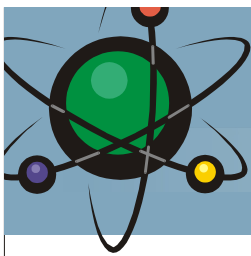


Fig 12.3 : Distribution or annual background radiation



Percent distribution of annual background gamma radiation levels in Banduhurang cluster of villages.

Table 12.1: Annual environmental background gamma radiation levels in Banduhurang cluster, recorded using TLD. Survey meter readings are given for comparisons.

S.No	Village	Latitude (N)	Longitude (E)	Annual Gamma Radiation Level (mGy/a)	Survey meter Reading (mGy/a)
1	Pondehsa 1	22,44.206	86,11.716	1.10	1.09 ± 0.03
2	Pondehsa 2	22,44.313	86,11.543	1.09	1.28 ± 0.03
3	Pondehsa 3	22,44.222	86,11.617	0.77	0.94 ± 0.02
4	Boyanbil 1	22,43.737	86,12.548	1.33	1.56 ± 0.04
5	Boyanbil 2	22,43.457	86,12.795	1.20	1.42 ± 0.02
6	Boyanbil-3	22,43.589	86,12.844	0.84	1.06 ± 0.05
7	Nandup-1	22,43.479	86,11.835	1.18	1.77 ± 0.03
8	Nandup-2	22,43.321	86,11.925	1.46	1.87 ± 0.03
9	Nandup-3	22,43.105	86,12.039	1.92	2.10 ± 0.01
10	Kudada-1	22,42.538	86,12.128	1.26	1.06 ± 0.04
11	Kudada-2	22,42.462	86,12.244	1.11	1.16 ± 0.02
13	Matku-2	22,40.993	86,13.641		1.54 ± 0.01
14	Matku-3	22,40.932	86,13.577	0.94	1.01 ± 0.01
15	Matku-4	22,41.096	86,13.767	0.79	0.89 ± 0.01
16	Turamdih-1	22,42.846	86,11.640	1.32	0.84 ± 0.02
17	Turamdih-2	22,42.856	86,10.571		1.26 ± 0.03
18	Talsa-1	22,43.075	86,10.449		2.58 ± 0.02
19	Talsa-2	22,43.061	86,10.371	1.16	1.02 ± 0.01
20	Talsa-3	22,42.834	86,10.490	1.29	1.28 ± 0.03
21	Ghagidih-1	22,45.005	86,11.990	0.97	1.41 ± 0.01
22	Ghagidih-2	22,45.029	86,10.892	1.13	1.17 ± 0.02
23	Kerwadungri-1			2.00	1.30 ± 0.02
24	Kerwadungri-2			0.66	
25	Kerwadungri-3			0.85	
26	TCS Office	22,47.971	086,11.393	0.95	

2. Mohuldih Cluster

Results of the TLD analysis for the village cluster of Mohuldih where eleven villages were monitored with the help of 25 TLDs are shown in Table 2. It is seen that the annual gamma radiation levels in this cluster varied between 0.95-2.38 mGy/a with an average of 1.47 ± 0.40 mGy/a. Fig.12.4 shows the percent distribution of the radiation levels in the cluster. Overall 92% of the locations are seen to be below 2 mGy/a.

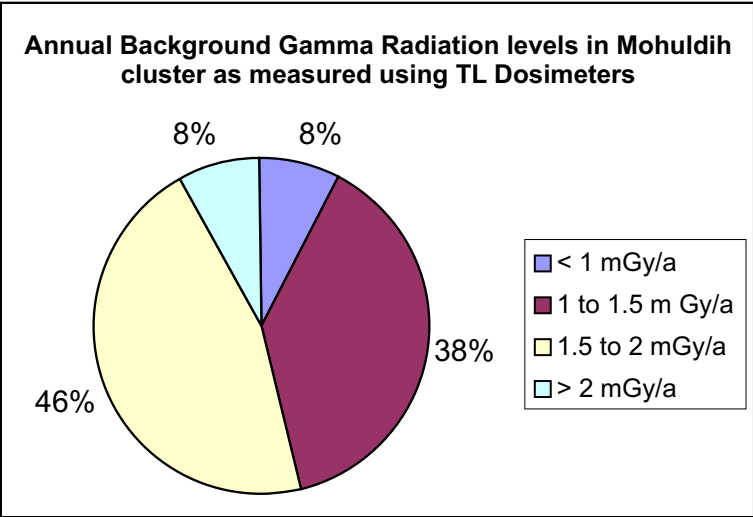


Fig. 12.4: Percent distribution of annual background gamma radiation levels in villages of Mohuldih cluster.

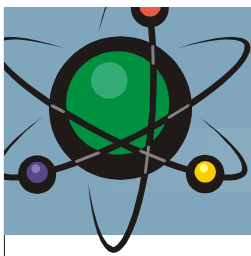


Table 12.2: Annual environmental background gamma radiation levels in Mohuldih cluster, recorded using TLD. Survey meter readings are given for comparisons.

S.No	Mohuldih	Latitude	Longitude	Annual Gamma Radiation Level (mGy/a)	Survey Reading (mGy/a)
1	Dhatkidih	22,44.001	86,09.593	0.95	
2	Dhatkidih	22,44.014	86,09.612	2.33	2.04 ± 0.03
3	Bamandungri	22,43.513	86,09.245	1.89	1.41 ± 0.04
4	Bamandungri	22,43.525	86,09.32	1.21	1.19 ± 0.02
5	Bindapur	22,43.296	86,09.715	1.63	1.06 ± 0.05
6	Bindapur	22,43.329	86,09.715	1.11	1.16 ± 0.02
7	Bindapur	22,43.423	86,09.678	1.1	1.11 ± 0.04
8	Bondih		.	1.05	
9	Bondih	22,43.724	86,08.519	2.38	1.81 ± 0.06
10	Kumhari	22,44.098	86,09.035	1.53	1.83 ± 0.03
11	Kumhari	22,44.146	86,09.051	1.58	1.37 ± 0.02
12	Mohuldih*	22,44.388	86,08.713	1.46	1.30 ± 0.02
13	Mohuldih*	22,44.388	86,08.713	1.46	1.30 ± 0.02
14	Mohuldih*	22,44.388	86,08.713	1.56	1.30 ± 0.02
15	Tirildih	22,44.370	86,08.177	1.59	1.90 ± 0.03
16	Tirildih	22,44.357	86,08.201	1.77	2.08 ± 0.02
17	Dudra	22,44.592	86,08.458	1.69	1.98 ± 0.02
18	Dudra	22,44.579	86,08.417	1.57	1.48 ± 0.02
19	Parbatipur	22,44.681	86,08.600		2.10 ± 0.02
20	Parbatipur	22,44.695	86,08.590	1.73	1.88 ± 0.02
21	Kamalpur	22,44.859	86,08.841	1.94	1.43 ± 0.03
22	Kamalpur	22,44.877	86,08.860	1.39	1.31 ± 0.02
23	Jillingora	22,45.349	86,09.272	1.2	1.14 ± 0.04
24	Jillingora			0.95	1.39 ± 0.02
25	Jillingora			1.08	1.12 ± 0.02

3. Bagjata Cluster:

Outdoor environs of 14 locations in 6 villages of Bagjata cluster were monitored with the help of 14 TLDs. Table 3 shows the results of the TLD analysis for these villages. It was observed that the annual gamma radiation levels varied between 0.80-2.15 mGy/a with an average of 1.20 ± 0.40 mGy/a. Fig.12.5 shows the percent distribution of the radiation levels in the cluster. Overall 93% of the locations are seen to be below 2 mGy/a. Only 7% are above 2mGy/a

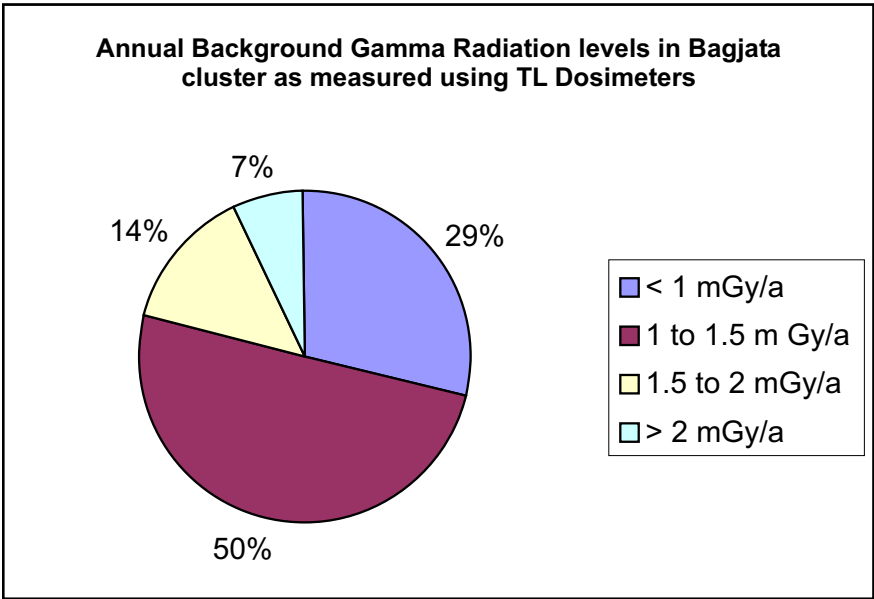


Fig. 12.5: Percent distribution of annual background gamma radiation levels in villages of Bagjata cluster .

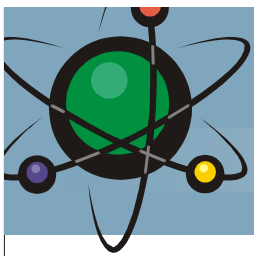


Table 12. 3: Annual environmental background gamma radiation levels in Bagjata cluster, recorded using TLD. Survey meter readings are given for comparisons.

S.No	Mohuldih	Latitude	Longitude	Annual Gamma Radiation Level (mGy/a)	Survey Reading (mGy/a)
1	Badia	22,30.006	86,01.105	1.01	1.25 ± 0.03
2	Badia	22,30.129	86,88.247	1.25	1.61 ± 0.03
3	Badia	22,29.765	86,28.523	1.06	1.63 ± 0.03
4	Gohala	22,29.462	86,30.424	1.12	1.59 ± 0.02
5	Gohala	22,29.140	86,30.337	1.59	
6	Kanyaloka	22,28.847	86,30.705	2.15	2.41 ± 0.02
7	Kanyaloka	22,28.989	86,30.505	0.8	0.84 ± 0.02
8	Phuljhari	22,28.236	86,29.326	0.93	1.33 ± 0.02
9	Phuljhari	22,28.489	86,29.417	0.97	1.27 ± 0.02
10	Phuljhari	22,28.528	86,29.415	1.04	1.14 ± 0.02
11	Bhadua	22,28.679	86,29.548	1.06	1.21 ± 0.02
12	Bhadua	22,28.703	86,29.502	1.91	1.16 ± 0.02
13	Bakra	22,28.962	86,29.085	1.02	1.30 ± 0.03
14	Bakra	22,29.098	86,29.020	0.89	1.12 ± 0.02

The data was further subjected to village wise analysis and overall average in the region was evaluated as shown in Table 4. Each average for survey meter readings is taken for all the locations together in the village. The overall average based on all the data is furnished in the last column of the table. Overall percent distribution of the radiation levels in all the 26 villages is shown in Fig.12.6 It is seen that 70% of the locations are in the range 1-2 mGy/a.

Table 12.4: Village wise average background gamma radiation doses for various clusters
Cluster 1: Banduhurang

S.No	Village	Annual Average (mGy/a)	
		TLD Readings	Survey meter Readings
1	Pondehsa	0.98 ± 0.19	1.10 ± 0.14
2	Boyanbil	1.12 ± 0.25	1.35 ± 0.22
3	Nandup	1.52 ± 0.37	1.92 ± 0.15
4	Kudada	1.18 ± 0.11	1.11 ± 0.06
5	Matku	0.84 ± 0.09	1.07 ± 0.29
6	Turamdih	1.70 ± 0.55	1.92 ± 0.69
7	Talsa	1.15 ± 0.14	1.24 ± 0.17
8	Ghagidih	1.05 ± 0.11	1.24 ± 0.07
9	Kerwadungri	1.17 ± 0.73	
	Cluster Average	1.2 ± 0.37	1.3 ± 0.42
Cluster 2: Mohuldih			
S.No	Village	Annual Average (mGy/a)	
		TLD Readings	Survey meter Readings
1	Dhatkidih	1.64 ± 0.97	2.53 ± 0.52
2	Bamandungri	1.55 ± 0.48	1.30 ± 0.12
3	Bindapur	1.28 ± 0.30	1.11 ± 0.06
4	Bondih	1.72 ± 0.94	2.21 ± 0.42
5	Kumhari	1.56 ± 0.03	1.60 ± 0.25
6	Mohuldih	1.49 ± 0.06	1.30 ± 0.02
7	Tirildih	1.68 ± 0.12	1.99 ± 0.10
8	Dudra	1.63 ± 0.08	1.73 ± 0.26
9	Parbatipur	1.45 ± 0.40	1.99 ± 0.12
10	Kamalpur	1.67 ± 0.39	1.37 ± 0.07
11	Jillingora	1.08 ± 0.12	1.22 ± 0.13
	Cluster Average	1.5 ± 0.40	1.6 ± 0.49
Cluster 3: Bagjata			
S.No	Village	Annual Average (mGy/a)	
		TLD Readings	Survey meter Readings
1	Badia	1.11 ± 0.13	1.5 ± 0.18
2	Gohla	1.36 ± 0.33	2.0 ± 0.41
3	Kanyaloka	1.47 ± 0.95	1.6 ± 0.83
4	Phuljhari	0.98 ± 0.06	1.2 ± 0.08
5	Bhadua	1.49 ± 0.60	1.2 ± 0.03
6	Bakra	0.95 ± 0.09	1.2 ± 0.1
	Cluster Average	1.2 ± 0.40	1.4 ± 0.44

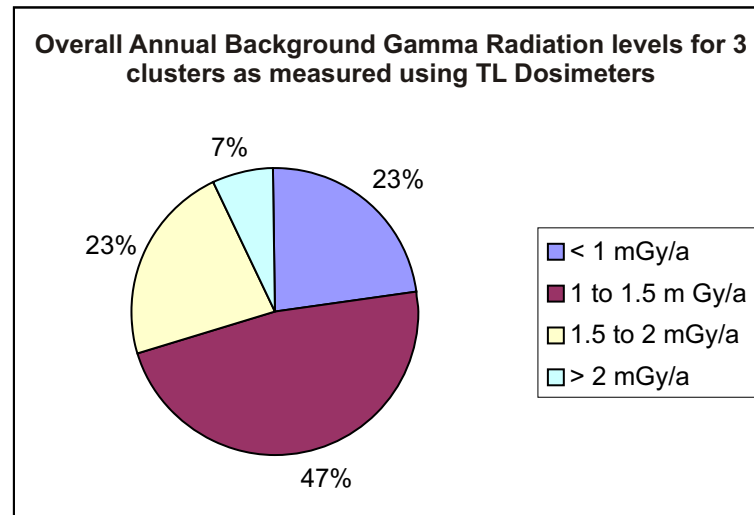
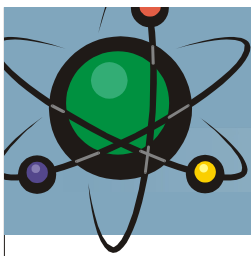


Fig.12.6: Overall distribution of external gamma radiation levels in the Banduhurang, Bagjata and Mohuldih regions of proposed uranium mines.

Considering that there are 26 villages in the region with a minimum 2 locations that were monitored for outdoor gamma radiation levels using TLDs, village wise distribution was calculated and is as shown in Fig.12.6. It is worth noting that only 7% of total locations showed annual gamma radiation dose in excess of 2 mGy/a. Majority of the locations, 47% were in the range 1 to 1.5 mGy/a. 23% locations were in the range below 1 mGy/a as well as in the range 1.5 to 2 mGy/a.

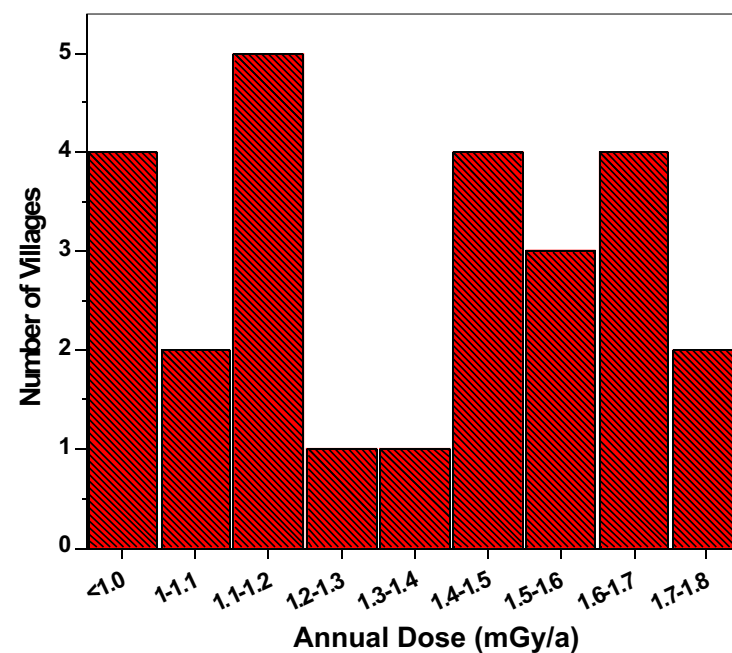


Fig. 12.7: Village wise distribution of average annual gamma radiation dose. All the 26 villages showed annual gamma radiation levels less than 2 mGy/a.

Correlation between data generated in all the villages using TLD and that by survey meter is as shown in Fig. 12.8. Ideally, the slope of such a correlation should be unity. In reality however, this is not always possible since on the one hand, the TLD data is cumulative in nature and yields an average over the period deployment, the survey meter data is instantaneous and may vary from time to time depending on many meteorological parameters. The near unity value of the slope can approach only when a large number of survey meter data, recorded on various occasions, is generated and the averages taken. In the present case, the survey meter readings were recorded during only the time of deployment and retrieval. The correlation coefficient is 0.59. This is attributable to the stable radiation levels in the region that was surveyed. This was also observed during the survey when the survey meter readings were recorded. As seen in Table 1,2 and 3, the variation in the survey meter readings are quite less compared to the other areas in the country.

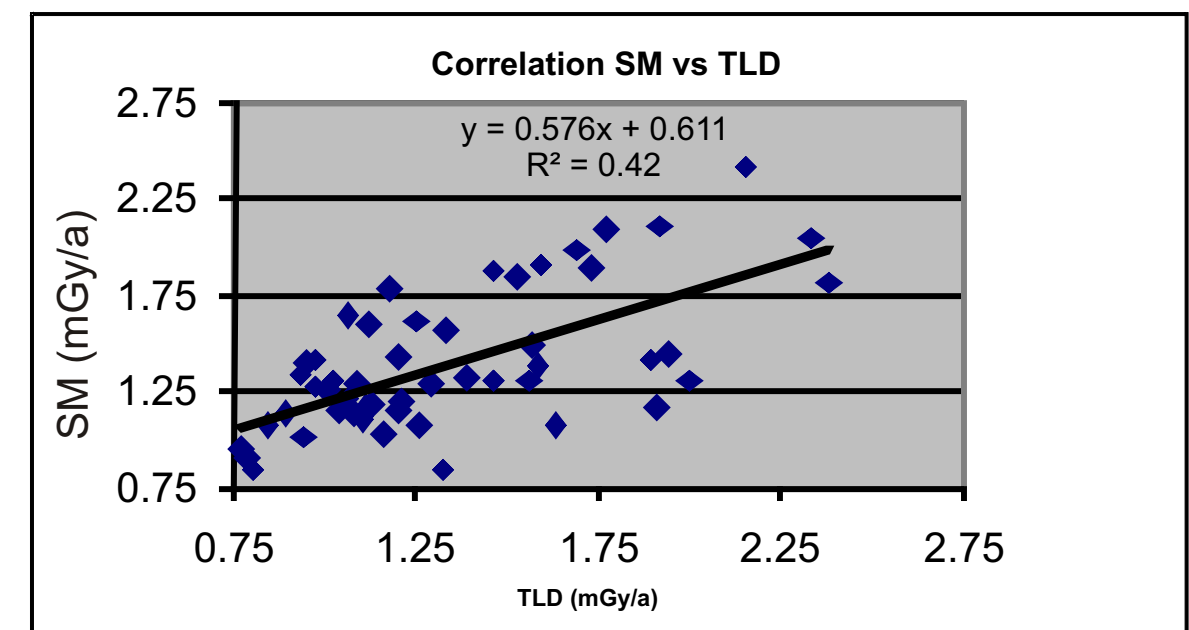
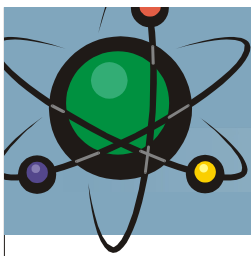


Fig. 12.8: Correlation between the gamma radiation levels data generated using TLDs and survey meter. The correlation coefficient of 0.59.



13 OVERALL OBSERVATIONS AND CONCLUSIONS

This chapter provides the observations and conclusions with respect to the three core areas of study, i.e. Demography, Health and Annual Gamma Radiation Dose Level.

13.1 Demographic and Socio-economic

The Demographic features, which include some key socio-economic phenomena are:

1. 63% of the total households are Tribal communities followed by Other Backward Caste (27%), Scheduled Castes (6%) which implies that the area is predominantly populated by socio-economically underprivileged communities.
2. Average family size is 6 which reflect that majority families are nuclear in nature.
3. Level of education: Literacy rate is 57% which is marginally higher than the percentage literacy of Jharkhand (54%) but quite lower than national figure (65%). Level of higher education reflects a dismal scenario. Graduate and Post Graduate taken together comprises only 0.19% of the total population.
4. Only 5% of the population has skill/vocational training. Thus availability of skilled work force is very poor.
5. Because of lack of alternate employment, i.e other than agriculture (even agriculture is unable to provide food year round) unemployment is high at 69%.
6. Around 50% of the families come under Below Poverty Line category.
7. A vast majority (84%) live in 'kachcha' (mud & thatched roof) house.
8. Only 29% of the household have electricity in their house. Majority use kerosene oil as the source of light.
9. 98% households use conventional source of energy, i.e.- firewood, cow dung and coal.
10. Around 50% of the household still use well or river as source of drinking water. 48% have access to Tubewell which is considered as safe mode of drinking water.
11. Education facilities: 89% households have Primary School in their villages; 30% have Middle School accessibility and 11% have High School.
12. 82% households have Anganwadi in their village. An Anganwadi is the village level unit of Integrated Child Development Scheme (ICDS) project of Govt. of India. This figure is remarkable (of course, if the Anganwadis function properly) because an Anganwadi is the grassroot level unit of mother and child health which provides key services like- Ante natal care, child immunization and pre-school education through the 'Anganwadi Sevika' and Auxiliary Nurse Midwife (ANM).
13. Agriculture is the main source of livelihood but the situation of irrigation is poor. Only 51% of the households have irrigated land. Others solely depend upon rainfall.
14. Highly mechanized agriculture is followed by a very meager population. Only 23 families out of 4123 studied own tractor, only 6 own thresher and 8 households have generator.
15. 20% of the households do not have adequate foodgrain availability (from their agricultural products) round the year. The lean season is August-September when the stock of previous season ends.
16. Major reason for indebtedness is to meet medical expenditure.
17. Majority of the respondents are in the opinion that in recent times the economy is improving which is reflected in majority view that Employment opportunity, Trade & business and income scenario have improved. However the rate of crime has increased according to the respondents.

18. Participatory Rural Appraisals brought up the following issues: poor attendance and high drop out at school level leading to less children going for higher education; poor reach of development programs of the Government to the villagers; problem of drinking water caused due to improper construction of tubewells (they go out of order in a few months)

13.2 Health

Key observations pertaining to Health are:

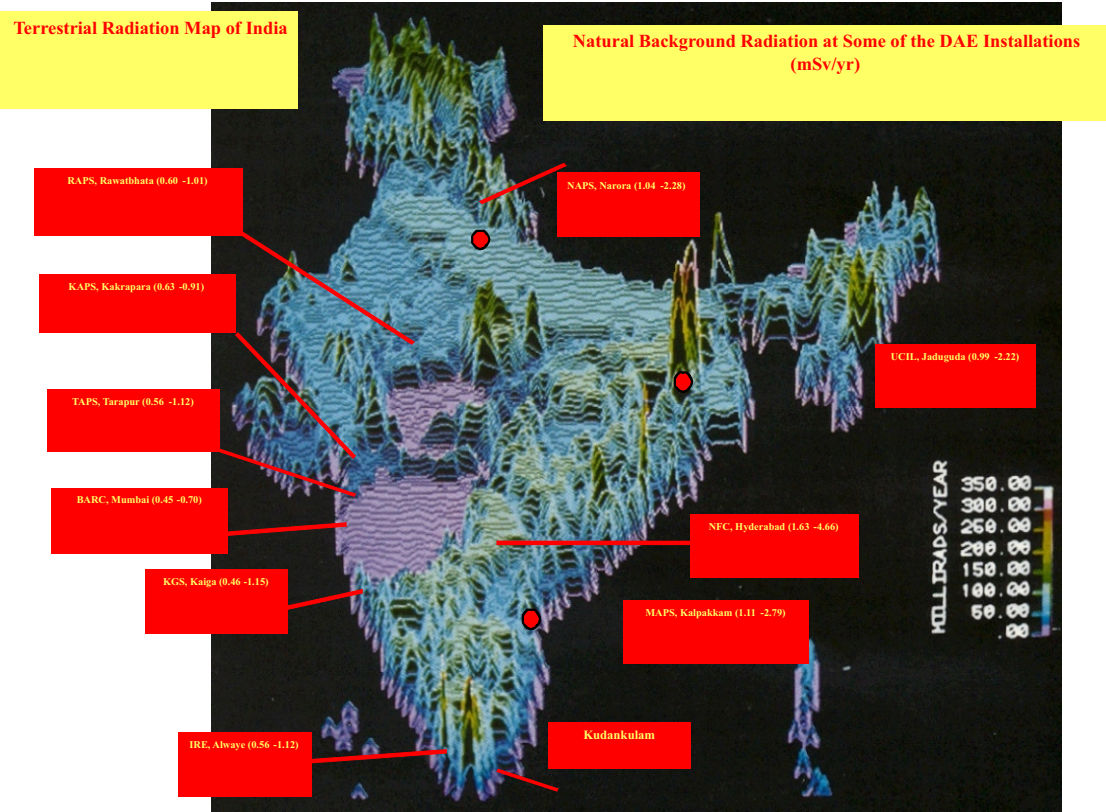
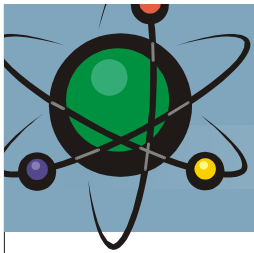
1. General weakness is the most prevalent malady among the villagers who visited the medical camps which is 16%. Both men and women have this problem as highest in comparison to other sicknesses. This is mainly due to improper nutrition resulting from food scarcity, morbidities not properly addressed, unsafe drinking water used by majority causing perpetual health problems. However, 27% respondents/visitors had no disease. Other prevalent diseases are viral infection and skin diseases. Malaria is also a prevalent disease which is often not diagnosed due to unavailability of infrastructure.
2. Some cases of low Haemoglobin were found in the study sites as well as control sites among both male and female which was due to malnutrition and malaria.
3. Total WBC count is found to be normal all across, i.e among male and female in the study site and control site.
4. Different WBC counts, i.e. Neutrophils, Lymphocytes, Eosinophils and Monocytes are found to be normal all across, i.e. among males and females in study site and control site.

13.3. Annual Gamma Radiation Dose

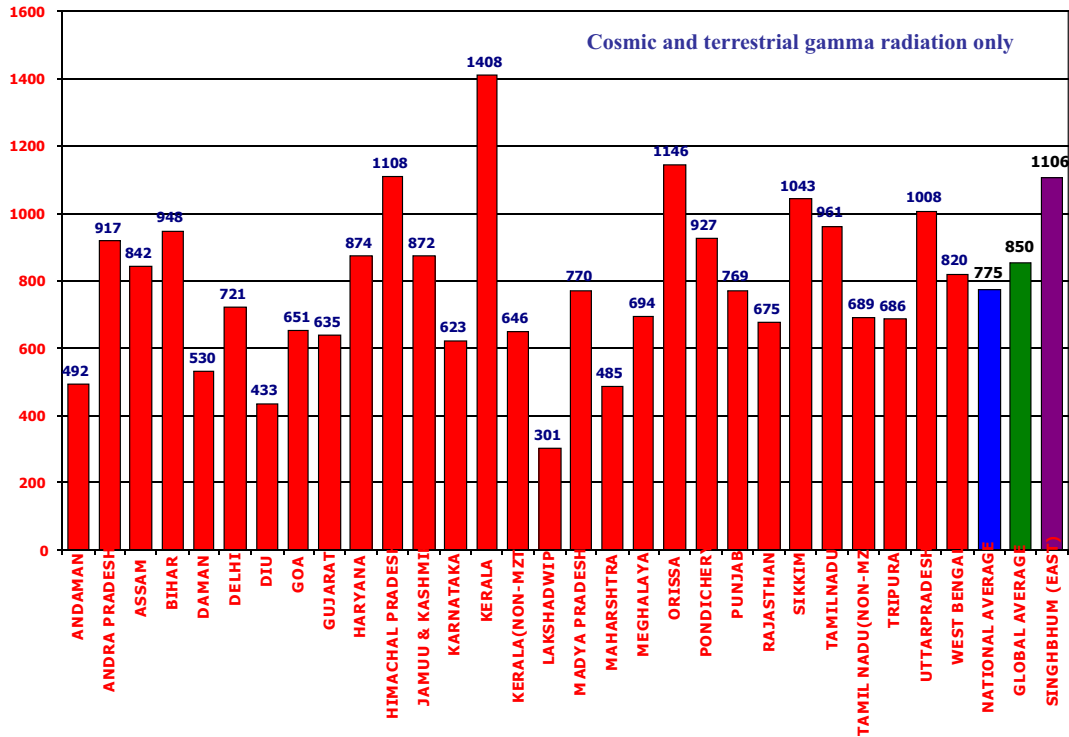
Overall average for the region, based on the TLD readings was also calculated and was found to be 1.3 ± 0.4 mGy/a. The geometric mean and GSD for the same was observed to be 1.24(1.35) mGy/a. The national average in Indian context, except the high background radiation areas, has been reported as 2.0(1.9) mSv/a (Nambi et al, 1986). In the case of HBRAs, Chougaonkar et al (2006) have evaluated the total doses (inclusive of external gamma radiation dose as well as inhalation dose) in the range of 1-26 mSv/a. They also established that out 520 houses they studied, Seventy three % (379) of the houses showed the dose levels less than 5 mSv/a while 20% (106) showed those between 5-10 mSv/a. Seven % of the houses (35) exhibited between 10-25 mSv/a. Thus in general, the background gamma radiation levels observed in the areas of present survey are comparable with those observed elsewhere in India. On the other hand, even the highest values observed in the areas are considerably lower than those observed in HBRAs in Kerala, India.

Key observations on annual gamma radiation dose in the area are:

1. In general, the external gamma radiation levels in the locations monitored were steady; this observation was corroborated by spot survey meter readings that were taken during deployment of TLDs.
2. There are 5 locations out of 65 that show the annual gamma radiation dose level in excess of 2 mGy/a, the highest being at Bondih village, 2.38 mGy/a. The average of 2 locations in the village however, is 1.72 ± 0.94 mGy/a. This, when compared with the national average, appears to be comparable. On the other hand, they are considerably less than the higher values observed in HBRAs, Kerala.
3. Of all the 65 locations monitored, 23% show less than 1 mGy/a, 47% locations show the annual gamma radiation dose level between 1-1.5 mGy/a while 23% show 1.5-2 mGy/a. Remaining 7% locations exhibit annual dose in excess of 2 mGy/a (ref. Fig 12.6).
4. These levels are comparable with other regions of Singhbhum Uranium mineralised area. In certain other regions of the Country, elevated levels have been observed. The average annual gamma dose rate in Kerala is 1.40 mGy per year which is comparable or more than 70 % of the locations surveyed in the study area.



AVERAGE NATURAL RADIATION BACKGROUND LEVELS IN DIFFERENT STATES OF INDIA



Annexure I (Interview Schedule)

TRIBAL CULTURAL SOCIETY
JAMSHEDPUR
DEMOGRAPHIC & EPIDEMIOLOGICAL SURVEY

प्रारम्भिक सचना

गाँव का नाम _____

पंचायत _____

परिवार के मुखिया का नाम _____

उत्तर दाता का नाम _____

राशन कार्ड संख्या _____

वर्ल्ड स्टार गाँव मकान संख्या _____

कोड नं. _____

बी. पी. एल. _____

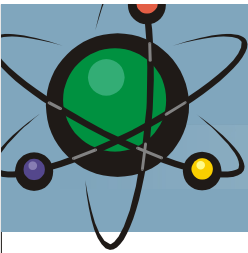
कार्ड संख्या _____

प्रश्नकर्ता का नाम	हस्ताक्षर	तिथि	क्या सम्पूर्ण सूचना एकत्रित हुई
पहली बार			हाँ नहीं
दूसरी बार			हाँ नहीं
तीसरी बार			हाँ नहीं

सुपरवाइजर : _____

नाम _____

हस्ताक्षर _____

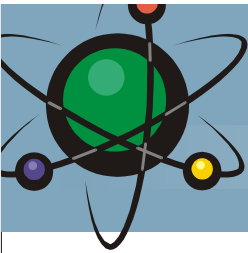


पारिवारिक संरचना

1. धर्म : सरना1 हिन्दु 2 मुस्लिम 3 सिख 4 इसाई 5 अन्य 6
2. जाति : अनुसूचित जाति 1 अनुसूचित जनजाति 2 अन्य पिछड़ी जाति 3 सामान्य 4 अन्य (स्पष्ट करें) 5
3. घर से संबंधित

क्र. यह क्रम कोल आगे के प्रश्नों में इस्तेमाल करें	परिवार के सदस्यों के नाम	आयु.	लिंग	वैवाहिक स्थिति	घर के मुखिया से संबंध	शैक्षणिक योग्यता	व्यवसायिक प्रशिक्षण	रोजगार	अक्षम व्यक्ति
			पुरुष-1 महिला-2	विवाहित.....1 अविवाहित.....2 विधवा.....3 विधुर.....4 तलाकशुदा या अलग.....5	स्वयं.....1 मुखिया का पति/पत्नी.....2 पुत्र/पुत्री.....3 पुत्र/पुत्री के पत्नी/पति.....4 पोता-नाती/पोती-नतनी.....5 पिता/माता.....6 भाई/बहन.....7 स्वसुर/सास.....8 साला-बहनोई/साली.....9 नौज्व/कर्मचारी.....10 अन्य.....(स्पष्ट करें).....11	निरक्षर.....1 प्राथमिक शिक्षा.....2 माध्यमिक शिक्षा.....3 मैट्रिक.....4 इंटरमीडिएट.....5 बी.ए./बीएससी/बीकॉम.....6 एम.ए./एमएससी/एम कॉम.....7 डिप्लोमा.....8 प्रोफेशनल डिग्री.....9 अन्य (स्पष्ट करें).....10 उत्तरेख/स्पष्ट करें.....11	कोई ट्रेनिंग नहीं.....0 पॉलिटेक्निक.....1 इंजिनियरिंग.....2 नर्सिंग.....3 फिटिंग.....4 परेड्युक्शन सिस्टम मैकेनिक.....5 वेल्डिंग एवम् गैस कटिंग.....6 ऑटो रिपैर मैकेनिक.....7 अन्य स्पष्ट करें.....8	हाँ.....1 नहीं.....2	नहीं.....0 अंधा.....1 बहरा.....2 गूंगा.....3 लंगड़ा.....3 मानसिक रूप से असंतुलित.....5 अन्य.....6 यदि हाँ, तो कितने वर्षों से.
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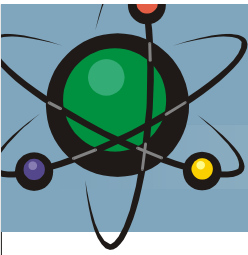
रोजगार संबंधित

रोजगार कोड	पारिवारिक सदस्य का क्र. कोड	मुख्य रोजगार स्रोत		द्वितीय रोजगार स्रोत		आयु का अन्य स्रोत	
		रोजगार कोड	कितने महीनो के लिए	मासिक आय	रोजगार कोड	कितने महीनो के लिए	मासिक आय
1. अपने खेत में खेती							
2. अन्य व्यक्ति के खेत में खेती							
3. स्वयं का व्यापार							
3.1 किराना की दुकान							
3.2 सब्जी की दुकान							
3.3 साइकिल रिपैयर दुकान							
3.4 लेथ दुकान							
3.5 पान / सिगरेट की दुकान							
3.6 चाय की दुकान							
3.7 कपड़े की दुकान							
3.8 टेंट हाउस							
3.9 दवाई की दुकान							
3.10 होलर मशीन							
3.11 सिलाई की दुकान							
3.12 नाई की दुकान							
3.13 लोहार की दुकान							
3.14 मोची की दुकान							
3.15 बढई की दुकान							

रोजगार संबंधित

रोजगार कोड	पारिवारिक सदस्य का क्र. कोड	मुख्य रोजगार स्रोत		द्वितीय रोजगार स्रोत		आयु का अन्य स्रोत	
		रोजगार कोड	कितने महीनो के लिए	मासिक आय	रोजगार कोड	कितने महीनो के लिए	मासिक आय
3.10 अन्य (स्पष्ट करें)							
4. कम्पनी कर्मचारी							
4.1 यूथिल							
4.2 टाटा स्टील							
4.3 अन्य (स्पष्ट करें)							
5. पेंशन / ESS							
6. ट्रांसपोर्ट							
7. साधारण मजदूर							
8. खनन मजदूर							
9. कॅन्ट्रिबटर							
10. जानवर पालन							
10.1 गाय / भैंस पालन							
10.2 सूअर पालन							
10.3 बकरी पालन							
10.4 भुर्गी पालन							
10.5 अन्य (स्पष्ट करें)							
11. अन्य (स्पष्ट करें)							

continued.....



पलायन संबंधित सचना

1. क्या आपके परिवार में कोई पलायन करता है?
- हाँ ☐ नहीं ☐
2. यदि हाँ

पारिवारिक सदस्य का क्र. कोड	कहाँ (स्थान)	कितने महीनों के लिए (महीनों के नाम लिखिए)	क्यों 1. ज्यादा कमाई के लिए 2. यहाँ काम नहीं मिलता 3. घर में झगड़ों के कारण 4. शहर जाने की चाह 5. अन्य (स्पष्ट करें)	आय (रुपया)

A RESEARCH REPORT

गृह सुविधा एवं संसाधन की सचना

1. घर का बनावट

कच्चा / फूस की छत.....1

कच्चा / खपड़े की छत.....2

सेमी पक्का.....3

पक्का.....4

2. आपके घर में प्रकाश का मुख्य स्रोत क्या है?

कोई नहीं.....1 (→5)

बिजली.....2

गोबर गैस, तेल, केरोसीन.....3 (→5)

अन्य (स्पष्ट करें).....4 (→5)

3. आप बिजली के लिए कब कब बिल भुगतान करते हैं ?

कभी नहीं.....1 (→5)

जब पैसे होते हैं.....2

2-3 महीने में एक बार.....3

हर महीने.....4

4. बिजली पर हर महीने कितना बिल भुगतान करते हैं?

रु.

5. घर में खाना पकाने के लिए किस प्रकार के ईंधन का प्रयोग करते हैं?

एल पी जी गैस.....1

गोबर गैस.....2

बिजली ☐

केरोसिन.....3

कोयला.....4

जलावान की लकड़ी.....5

गोइटा.....6

पत्ते / पुआल इत्यादि.....7

अन्य (स्पष्ट करें).....8

मुख्य ईंधन ☐

द्वितीय ईंधन ☐

6. पीने के पानी का स्रोत क्या है?

कुआँ.....1

चापाकल.....2

टंकी / तालाब.....3 (→10)

(पीने के लिए आरक्षित)

नदी / कैनल / तालाब.....4 (→10)

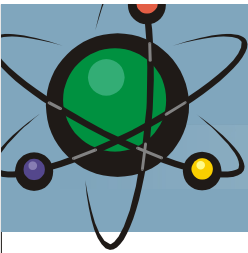
अन्य (स्पष्ट करें).....5 (→10)

7. इस स्रोत का मालिक कौन है ?

स्वयं.....1

कोई और व्यक्ति.....2

सार्वजनिक.....3



8. क्या यह स्रोत अन्य लोगों द्वारा भी प्रयोग किया जाता है ?
हाँ.....1
नहीं.....2 (→10)

9. अन्य कितने घरों द्वारा यह प्रयोग किया जाता है?
घरों की संख्या :

10. यह स्रोत आपके घर से कितना दूर है?
परिसर के अन्दर.....1
500 मीटर से कम.....2
500 मीटर से 1 कि. मि.....3
1 कि. मि. से ज्यादा.....4

11. क्या यह स्रोत कभी सूखता है?
हाँ.....1
नहीं.....2 (→13)

12. क. इस स्रोत के सूखने पर आप पानी कहाँ से लाते हैं?
कुआँ.....1
चापाकल.....2
टंकी/तालाब.....3
(पीने के लिए आरक्षित)
नदी/कैनाल/तालाब.....4
अन्य (स्पष्ट करें).....5

12 ख. यह स्रोत आपके घर से कितने दूरी पर स्थित है?
परिसर के अन्दर.....1
500 मीटर से कम.....2
500 मीटर से 1 कि. मि.....3

13. पीने के पानी के लिए पिछले 12 महिनो में क्या आपने शुल्क अदा किया है?
हाँ.....1
नहीं.....2 (→15)

14. यदि हाँ, कितना शुल्क अदा किया है?
रु.
किस पर

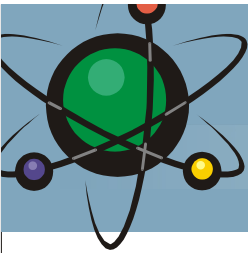
15. किस प्रकार के शौचालय का उपयोग करते हैं?
कोई नहीं.....1 (→ अगले प्रमाण पर जायें)
सर्विस शौचालय.....2
पोर फलश टायलेट.....3
फलश युक्त सेंटिक टायलेट.....4

16. क्या आपके द्वारा उपयोग किया जानेवाला शौचालय का उपयोग अन्य घरों द्वारा किया जाता है ?
हाँ.....1
नहीं.....2 (→ अगला भाग)

17. कितने घरों द्वारा? (घरों की संख्या)

सुविधाओं की उपलब्धता

1	2	3	4	5	6
सुविधाएँ	क्या..... (सुविधा का नाम) आपके गाँव में उपलब्ध है? हाँ 1 नहीं 2 (→4) पता नहीं...3 (→4)	यदि हाँ, तो क्या आप व परिवार के अन्य सदस्य उसका उपयोग करते हैं? हाँ.....1 (→ 5) नहीं.....2 (→ प्रश्नावली के अगले भाग में जाइए)	यदि नहीं, यह सुविधा सबसे नजदीक कहाँ उपलब्ध है? पास के गाँव में.....1 जमशेदपुर.....2 अन्य कोई शहर में.....3 पता नहीं.....4 (प्रश्नावली के अगले भाग में जाइए)	इस सुविधा तक पहुँचने लिए आप किस साधन का प्रयोग करते हैं? पैदल.....1 बैल गाड़ी.....2 साइकिल/रिक्शा.....3 मशीन चालित वाहन.....4 अन्य.....5 यदि दो या अधिक साधनों का प्रयोग होता है, तो सभी साधनों दोनों का कोड लिखिए	इस सुविधा तक पहुँचने में कितना समय और पैसा लगता है समय रु. पै.
1. प्राथमिक विद्यालय (I-V)					
2. माध्यमिक विद्यालय (VI-VII)					
3. उच्च विद्यालय (IX-XII)					
4. आंगनवाड़ी (IX-XII)					
5. प्राथमिक स्वास्थ्य केन्द्र					
6. सामूहिक स्वास्थ्य केन्द्र					
7. यूसिल अस्पताल					
8. गैर सरकारी अस्पताल/ प्राइवेट डॉक्टर					
9. सरकारी राशन दुकान					



जमीन संबंधित सचना

A. जमीन (बीघा/कट्ठा/एकड़/डिसमिल)

क. घर से जुड़ी	ख. कृषि भाग	ग. बंजर
घर	सिंचित	
बाड़ी	असिंचित	
टोटल (क)	टोटल (ख)	टोटल (ग)

B. क्या बारिश के अतिरिक्त आप अपने खेतों की सिंचाई करते हैं ?
हाँ..... 1 (→C)
नहीं..... 2 (→C)

माध्यम	कितनी जमीन सिंचते हैं	स्रोत तालाब.....1 कुँआ.....2 अन्य (स्पष्ट करें).....3
बिजली चालित पम्प		
डीजल चालित पम्प		
मनुष्य अथवा जानवर चालित माध्यम		
अन्य (स्पष्ट करें)		

A RESEARCH REPORT

पारिवारिक सम्पत्ति का विवरण

A. मवेशी

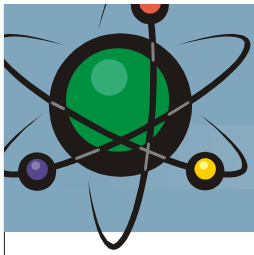
जानवर	संख्या
1. गाय	
2. बैल	
3. नर भैंस	
4. मादा भैंस	
5. बकरी	
6. भेड़	

जानवर	संख्या
7. घोड़ा/गधा/खच्चर	
8. सूअर	
9. मुर्गी	
10. बत्तख	
11. अन्य (स्पष्ट करें)	

C. गृहोपयोगी वस्तुएँ

उपकरण	संख्या	मूल्य (लगभग) (रुपया)
1. जुताई उपकरण		
2. बैल-गाड़ी		
3. ट्रैक्टर		
4. बिजली पम्प		
5. स्प्रेयर		
6. ठेकी		
7. श्वेशर		
8. जैनेटर		
9. अन्य (स्पष्ट करें)		

वस्तुएँ	संख्या
1. मोबाईल फोन	
2. टी. वी. - ब्लैक वाइट	
3. टी. वी. - कलर	
4. फ्रिज	
5. साईकिल	
6. टू व्हीलर - स्कूटर/मोटर साईकिल	
7. फोर व्हीलर - कार/जीप	
8. फोर/सिक्स व्हीलर ट्रक/डम्पर -	
9. एयर कूलर	
10. पंखा	
11. अन्य (स्पष्ट करें)	



भोजन की उपलब्धता

1. क्या आपके परिवार में सभी सदस्यों को पर्याप्त मात्रा में दो वक्त का भोजन पूरे वर्ष प्राप्त होता है?

हाँ..... 1 (→ 3)

नहीं..... 2

2. यदि नहीं, तो कृपया बताएँ कि किन महीनों में कमी होती (✓ लगायें)

जनवरी	फरवरी	मार्च	अप्रैल	मई	जून	जुलाई	अगस्त	सितम्बर	अक्टूबर	नवम्बर	दिसम्बर

3. पिछले 30 दिनों में क्या आपने राशन की दुकान से कुछ सामान खरीदा है?

हाँ..... 1

नहीं..... 2

(→ 4)

नहीं खरीदने का कोई विशेष कारण

बस्तुओं की सूची	आप का महीने का कोटा कितना है? यदि नहीं जानते तो लिखिए		पिछले 30 दिनों में कितना खरीदा		प्रति इकाई का कितना मूल्य चुकाया	खरीदी हुई वस्तुओं की क्वालिटी कैसी थी? बाजार से बेहतर 1 बाजार के समान 2 बाजार से खराब 3
	इकाई	मात्रा	इकाई	मात्रा		
चावल	किलो		किलो			
गेहूँ	किलो		किलो			
नमक	किलो		किलो			
केरोसीन	लिट्र		लिट्र			

4. क्या आपका नाम गरीबी रेखा के नीचे रहने वालों की सूची में शामिल है, जिन्हे राशन दुकान से वस्तुओं की आपूर्ति के लिए विशेष व्यवस्था है?

हाँ..... 1

नहीं..... 2

नहीं मालूम..... 3

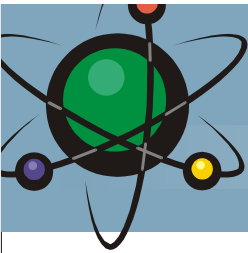
5. यदि हाँ, तो आपको ऐसा कोई कार्ड प्राप्त हुआ है जो इस बात को प्रमाणित करता है?

हाँ..... 1

नहीं..... 2

कार्ड संख्या

(कार्ड को देखकर स्वयं संख्या लिखिए)



स्वर्च एवम् ऋण संबंधित सचना

1. (क) आपके घर का एक महीने का सामान्य स्वर्च कितना होता है? रु (ख) विशेष तौर पर कितना स्वर्च होता है
2. आम तौर पर महीने का स्वर्च नीचे लिखि हुई चीजों में किस प्रकार विभाजित रहता है? कृपया 100 रूपया / 16 आना को मासिक स्वर्च मानकर यह बताएँ कि किस श्रेणी में कितना स्वर्च होता है। (प्रश्न कर्ता कृपया उत्तर को प्रतिशत में अंकित करें)

श्रेणी	रुपया	श्रेणी	रुपया
खाद्य पदार्थ		त्योहार	
दवाई		कृषि कार्य संबंधित	
पढ़ाई-लिखाई		व्यापार संबंधित	
कपड़े		अन्य (स्पष्ट करें)	

3. क्या आपकी वार्षिक आय आपके वार्षिक खर्चों के लिए पर्याप्त होती है? हाँ नहीं (→6)
4. यदि हाँ तो आप एक वर्ष में लगभग कितनी बचत कर लेते हैं? रु
5. इस बचत का प्रयोग आप कैसे करते हैं?
- व्यापार में डालते हैं.....1
- जमीन/कृषि उपकरण खरीदते हैं.....2
- जेवर/गृहपयोगी वस्तुएँ खरीदते हैं.....3
- बैंक में जमा करते हैं.....4
- ऋण चुकाते हैं.....5
- अन्य (स्पष्ट करें).....6
6. यदि कभी आय कम पड़ जाती है, तो क्या आप ऋण लेते हैं हाँ नहीं

7. आपके परिवार में ऋण लेने के क्या-क्या कारण हैं?
- दैनिक खर्चों की पूर्ति के लिए.....1
- दवाईयों/चिकित्सा.....2
- शादी के लिए ऋण.....3
- त्योहार पर खर्चों के लिए.....4
- घर बनाने/ग्रामत के लिए.....5
- कृषि संबंधी गतिविधियों के लिए.....6
- अन्य (स्पष्ट करें).....7
8. आप ऋण किस-किससे लेते हैं?
- बैंक.....1
- समूह में.....2
- महाजन.....3
- सगे-सम्बन्धी.....4
- कम्पनी.....5
- अन्य.....6
9. वर्तमान में, आपके परिवार पर कितना ऋण बकाया है?
- मूल -
- सूद/ब्याज -
- कुल -

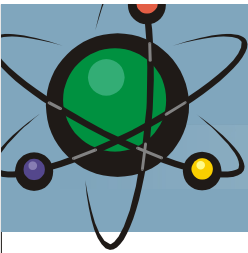
ऋण स्रोत	मासिक ब्याज	ऋण लौटाने के लिए प्राप्त समय



1	2	3				
अपके परिवार में सामान्यतः कौन-कौन सी बीमारियाँ होती हैं?	बीमार पड़ने पर इलाज के लिए कहाँ जाते हैं?	इलाज कराने हेतु कितना खर्च होता है? व कितना समय व्यतीत होता है?				
जन्म.....1	वैद्य.....1					
शवास संबंधी समस्या.....2	ओझा.....2					
टी. बी.....3	कविराज.....3					
हृदय रोग.....4	दवा दुकान वाला.....4					
मलेरिया.....5	ग्राम स्वास्थ्यकर्मी / नर्स प्रविश्रनर.....5					
जौन्डिस.....6	सरकारी डाक्टर / अस्पताल.....6					
रक्त चाप.....7	प्राईवेट डाक्टर / नर्सिंग होम.....7					
बुखार.....8	दान प्राप्त गैर सरकारी स्वस्थ केन्द्र के डाक्टर.....8					
डायरिया.....9	अन्य (स्पष्ट करें).....9					
मोतियाबिंद / अन्य दृष्टि संबंधी.....10	यदि एक से ज्यादा, तो सलाह / इलाज कराये जाने के क्रम अनुसार कोड लिखें)					
सर्दी खाँसी.....11						
खुजली.....12						
अन्य (स्पष्ट करें).....13						
	1	2	3	4	खर्चा	समय

A RESEARCH REPORT

[illegible]



1. क्या आपके घर में आज तक किसी को

	हाँ (वर्ष बताइये)	नहीं
मरा बच्चा पैदा हुआ		
गर्भपात हुआ		

2. क्या आपके परिवार में कोई असाधारण मृत्यु हुई है?

हाँ

नहीं

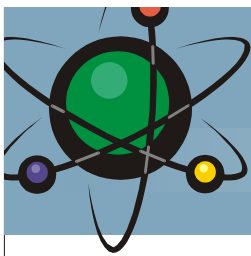
3. यदि हाँ, किस वर्ष

4. क्या हुआ था?

गाँव में बदलाव

A क्या पिछले..... वर्षों में निम्नलिखित क्षेत्रों में आपके गाँव में कोई बदलाव आया है?

क्र.	विवरण	कम हुआ है	ज्यादा हुआ है	कोई बदलाव नहीं	पता नहीं	टिप्पणी
1	पीने के पानी की उपलब्धता					
2	भूमिगत जल की उपलब्धता					
3	सिंचाई के पानी की उपलब्धता					
4	जंगल का क्षेत्र					
5	जलाने के लिए लकड़ी की उपलब्धता					
6	लोगों और जानवरों का पलायन दूसरे गाँव में					
7	लोगों और जानवरों का पलायन आपके गाँव में					
8	मच्छरों की आबादी					
9	जल प्रदूषण					
10	व्यापार					
11	रोजगार मिलने का मौका					
12	आय					
13	व्यय					
14	चोरी – चकारी					



B

क्र०	विवरण	अच्छा हुआ है	खराब हुआ है	कोई बदलाव नहीं	पता नहीं	टिप्पणी
1	जमीन की उपजाऊता					
2	मूलभूत सुविधा					
3	शिक्षा का अवसर					

2. क्या आपके परिवार में रोजगार में कोई बदलाव आया है?

☐

हाँ

☐

नहीं

☐

पता नहीं

3. यदि हाँ, तो किस प्रकार का बदलाव आया है?

क)

ख)

ग)

धन्यवाद !

Annexure II (Communication materials)

**आपके गाँव में
एक दिवसीय स्वास्थ्य शिविर**

निःशुल्क स्वास्थ्य शिविर

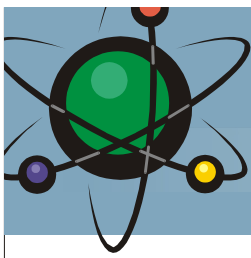
निःशुल्क दवाईयाँ

निःशुल्क एक्स रे

निःशुल्क रक्त जाँच

अधिक जानकारी के लिए संपर्क करें
ट्राईबल कल्चरल सोसाइटी
इ. रोड, नार्दन टाउन, बिस्टुपुर, जमशेदपुर
फोन : 0657-2433531, 2144094, 2143012

TRIBAL CULTURAL SOCIETY JAMSHEDPUR



एक दिवसीय स्वास्थ्य शिविर



प्रायोजक:

ट्राईवल कल्चरल सोसाईटी एवं
बोर्ड ऑफ रिसर्च इन न्यूक्लीयर साइन्सेस

दिनांक **16 जुलाई 2006** रविवार को
स्थान: प्राथमिक विद्यालय घाघीडीह
समय: प्रातः 9 बजे से 2 बजे तक

निःशुल्क
चिकित्सा

★ उपलब्ध सेवार्यें:

❖ विशेष सलाह

- हृदय विशेषज्ञ ● महिला रोग विशेषज्ञ ● नेत्र विशेषज्ञ
- नाक-कान - गला विशेषज्ञ ● शिशु विशेषज्ञ

❖ रक्त जाँच एवं व्यक्तिगत रिपोर्ट

- सी. बी. पी. प्लेटलेट काउन्ट

❖ निःशुल्क दवाईयाँ

❖ निःशुल्क एक्स-रे

अधिक जानकारी के लिए सम्पर्क करें:

ट्राईवल कल्चरल सोसाईटी

ई-रोड, नादर्न टाउन, बिष्टुपुर, जमशेदपुर में सम्पर्क करें।

दूरभाष : 0657-2433531, 2143012, 6570471