

Introduction:

Scheduled tribes with a population 83 million constitute a little over 8 percent of India's population as of 2001 census count. The recent census shows that nearly 47 percent of the Scheduled tribe (ST) were literate in the age group 7 and above, compared to 65 percent in the total population. Further nearly half the rural population belonging to Scheduled tribes is found living below the poverty line compared to one fourth in general population. Poverty is also much higher among STs compared with Scheduled cast (SC) population.

In tribal areas there is a lack of infrastructure particularly related to the supply of drinking water, electricity and educational and health facilities and services. Low access to health care and education, poor house hold amenities and sanitation facilities influences high infant and child mortality. Hence an attempt is made in this study to examine the household environment factors on child survival in tribal state in India viz: Chhattisgarh¹.

It has been observed that household environmental factors are more influencing on mother and child health. Better cooking facilities, availability of water at house, better sanitation facilities may lead to better living condition and intern may lead to better health. Research study done in Mewat region of Haryana state by Jatrana S :(2001) revealed that type of house and the presence of separate kitchen in the house significantly affect infant survival. Further in this study presence of latrine, ownership of land and education of father and mother could not show a significant effect on infant survival. Another research study done in Nepal (Gubhaju B et.al.1991) by examining Nepal Fertility survey data shows that probability of dying among infant was 44 percent higher for those drinking lake or river water than those using piped or tube well water. In this study it has been observed that those households not having toilet facilities had 64 percent higher probability of infant dying than those with their own toilet facilities. Study carried out in Bangladesh (Majumder AK; Islam SM 1993, Hoque BA et, al., 1999) by using Matlab data show that house hold environmental facilities and mother's education affect infant survival. Vinod Mishra et , al; (1997) by analyzing NFHS-1 data showed that persons living in households that primarily use biomass for cooking fuel have a considerably higher prevalence of active tuberculosis than persons living in households that use clean fuels. This effect is reduced when availability of a separate kitchen, house type, indoor crowding, age, etc.

It is a fact that measurement of household environmental factors influencing child survival is a complex phenomenon. The variables differs by different societies, geographical areas and by caste, religion of the household belongs. However, a broader category of variables, which are derived from a large survey viz: NFHS-2 forms the base for analysis of this study. Keeping in view of the above research studies and the data set the study aims:

1. To examine the household socio-economic and environmental, sanitary and child survival variables in tribal household in Chattisgarh.
2. To know the influence of environmental, sanitary variables influencing the child survival in Chattisgarh.

¹ State of Chhattisgarh came in to existence on 1 November 2000 having 20.8 million in 2001 census. 81 percent of the population of the state lives in rural areas. Among the total house holds 93 percent are Hindu, 5 percent are Christian and reaming belongs to Muslim and other religion. A significant proportion (nearly 76 percent) of household population in Chittatisgarh is tribes.

Data and Methodology:

Data for the present study has been drawn from National Family Health Survey (NFHS-2) conducted during 1998-99. The lists of variables considered for analysis has been listed in Table 1. The set of variables have been divided in to two categories. First category is referred to indirect indicators viz: Age of women, Current marital status, and education of women, type of place of residence, husband's education, and work status of women. The second category is referred as direct indicators viz: Availability of electricity in the house, source of drinking water, time to get drinking water, method of drinking water purification, type of toilet facility, main type of fuel used for cooking, type of house, SLI (standard living index). The dependent variable child survival has been measured by considering the ratio of children ever born to children surviving. If this child survival index is equal to one indicates that the number of deliveries and surviving children are equal and if the index is less than one indicates that women had experienced child loss in her reproductive period. A composite index has been calculated for Environmental factors. Score for Environmental (ENV index) and Sanitation index (SAN index) has been given in table 1. The analysis has been done by SC, ST and others to know the influence of Environmental and Sanitation factors on Child Survival.

Results:

The percentage distribution of SC, ST and others study women according to socio-economic variables have been listed in Table 2. It shown that Age, and marital status wise percent women found to be same in SC, ST and other caste in Chhattisgarh. Percentage illiterate women found to be more in ST, followed by SC and other caste (Table 2). More than 50 percent of women belongs to ST showed that the survival ratio less than one.

The percent women with household environmental factors, sanitation factors, type of house and SLI for SC, ST and Other Caste have been given in Table 3: Shows that nearly 50 per cent of household were using well water and around 43 per cent piped water facilities as source of drinking water. Nearly 68 per cent of SC and 64 per cent of ST population and 96.7 per cent ST population are not having toilet facilities at household level. Majority of SC and St Population of Chhattisgarh are living semi pucca houses and Standard of Living Index was less than medium (Table 3).

Table 1: List of variables considered for analysis in measuring influence of Environmental factors on child survival in Chhattisgarh, NFHS-2 data

Variables/Indicators:	Description	Score
<u>Indirect</u> (Back Ground variables)		
Age of the women		Grouped data
Respondent's Literacy	Illiterate	0
	Literate	1
Husband's Literacy	Illiterate	0
	Literate	1
Work Status of women	not working	0
	Working	1
<u>Direct</u> (Household level)		
Environmental factors		
Electricity	No	0
	Yes	1
Source of Drinking Water	Piped	3
	Well	2
	Other	1
Time to get drinking water	<15 minutes	2
	>15 minutes	1
Main type of fuel used for cooking	Wood	1
	Crop Residues/ Dung Cake/Coal/coke	
	Lignite/charcoal	2
	Kerosene	3
	Electricity/L.P.G/	
	Bio-gas	4
Environmental Index (ENF Index): Summation of above factor score		
Score <5 Poor House hold environment		
Score > 5 Better House hold environment		

Table continued

Table 1: continued:**Sanitation Factors**

Type of Toilet facility	Flush Toilet	2
	Pit toilet/latrine	1
	No facility	0
Method of Drinking Water Purification	Does not purify	0
	Strain water by cloth	1
	Use alums	2
	Use water filter	3
	Boil water/Use electronic Purifier	4

Household **Sanitation Index** (SAN index): Summation of above factor score
 Score Less than 3: Poor sanitation
 Score more than 3: Better Sanitation

Type of House	Pucca	2
	Semi and Not Pucca	1
SLI	Low/Medium	1
	High	2

Dependent Variable**Child Survival Index:**

Ratio of Children ever born to children surviving by women

Ratio Less than 1	0
Ratio Equal to 1	1

Table 2: Percent distribution of SC, ST and Other women by Background Characteristics of Chhattisgarh, NFHS-2

Background Characteristic	SC	ST	Others	Total
Age				
15-19	13.4	10.5	13.9	12.6
20-24	19.4	20.1	18.8	19.3
25-29	23.1	19.8	20.0	20.4
30-34	13.4	18.0	16.9	16.8
35-39	13.4	15.0	13.5	14.0
40-44	13.4	10.8	9.7	10.6
45-49	3.7	6.0	7.2	6.3
Current marital status				
Currently married	90.3	91.6	95.1	93.2
Separated	.7	.9	.6	.7
Deserted	3.0	2.4	1.7	2.1
Divorced	2.2	.3		.4
Widowed	3.7	4.8	2.5	3.5

Education				
Illiterate	76.1	80.2	57.8	68.4
Literate, < middle school complete	14.2	13.5	20.3	17.0
Middle school complete	1.5	3.3	9.7	6.3
High school complete and above	8.2	3.0	12.2	8.4
Type of place of residence				
Urban	28.4	3.3	26.6	18.6
Rural	71.6	96.7	73.4	81.4
Husband's education				
Illiterate	35.1	39.8	21.9	30.1
Literate, < middle school complete	33.6	35.0	36.1	35.4
Middle school complete	11.9	9.0	13.9	11.9
High school complete and above	18.7	15.3	27.8	22.1
Missing	.7	.9	.2	.5
Work Status				
For family member	24.6	45.8	24.9	32.3
For someone else	42.5	26.0	28.5	29.6
Self-employed	3.0	2.1	2.3	2.3
Not worked in past 12 months	29.9	26.0	44.3	35.8
Dependent Variable				
Child Survival Ratio				
Ratio of children surviving to children ever born				
Less than 1	44.0	52.4	41.8	45.9
Equal to 1	56.0	47.6	58.2	54.1
Total	134	334	474	942

To understand the association between direct and indirect variable with caste, “**Chi-square**” test has been applied. The results are shown in Table 4. Caste (SC/ST and others) had significant association with the environmental, sanitation and literacy variable.

Table 3: Percent distribution of SC, St and other women by characteristics in Chhattisgarh – NFHS-2 Data

Housing Characteristic	SC	ST	Others	Total
Electricity				
No	30.6	55.7	29.5	39.0
Yes	69.4	44.3	70.5	61.0
Source of drinking water				
Hand pump	50.0	42.5	42.8	43.7
Well water	22.4	49.4	32.9	37.3
Piped	21.6	4.5	23.2	16.3
Other	6.0	3.6	1.1	2.7
Time to get drinking water				
< 15 minutes	70.9	74.3	75.1	74.2
16 minutes and above	29.1	25.7	24.9	25.8

Method of drinking water purification				
Strain water by cloth	27.6	28.1	33.3	30.7
Use alums	3.7	3.3	6.3	4.9
Use water filter	1.5	0.6	2.7	1.8
Boils water		8.4	6.8	6.4
Use electronic purifier	.7		1.5%	.8%
Does not purify water	67.9	63.5	47.3	55.9
Use other method		2.4	5.3	3.5
Type of toilet facility				
Flush toilet	6.7	2.4	21.3	12.5
Pit toilet/latrine	3.7	.9	1.3	1.5
No facility	89.6	96.7	77.4	86.0
Main type fuel used for cooking				
Wood	87.3	93.7	74.1	82.9
Crop residues			.8	.4
Dung cakes	2.2	1.2	.6	1.1
Coal/coke/lignite	3.7	2.1	8.2	5.4
Charcoal		.6	.4	.4
Kerosene	2.2	1.5	2.7	2.2
Electricity		.3	.4	.3
Liquid petroleum gas	4.5	.6	11.4	6.6
Bio-gas			1.3	.6
Type of House				
Pucca	10.4	5.1	24.5	15.6
Semi-Pucca	87.3	94.6	74.8	83.6
Kachha	2.2	.3	.6	.7
SLI				
Low	39.6	37.8	27.1	32.7
Medium	50.7	58.3	51.3	53.7
High	9.7	3.9	21.6	13.6
Total	134	334	474	942

Table 4: Chi-Square Values between Caste and Socio-economic environment and Sanitation Index, NFHS-2 data.

Caste	With variable	χ^2	Level of significance
SC/ST and others	Child survival	9.116	
	Source of Drinking water	80.867	**
	Respondent's Education	49.938	**
	Husband's Education	33.701	**
	Environmental factor	65.096	**
	Sanitation factor Index	13.041	**

* P <.05, ** P <.001

Results based on Logit Regression Analysis:

To understand Environmental, Sanitation and background variables are influencing SC, ST and other population Logit regression analysis has been used. Regression results shows

(Table 5) that better household environmental factors, husband literate and working status of child among scheduled caste population. In the case of scheduled tribe population it has been observed (table 5) that household having medium and above index value, husband's literacy and working status of women found to influence child survival. However environmental factors and sanitation factors has shown less influence on child survival among scheduled tribe population. It has been observed that higher Household Standard Level Index (SLI) attributes to higher child survival status (1.0: 1.38) in SC and reverse in ST population. It reveals that as majority of Scheduled Tribe population live below poverty line their SLI found to be low and hence reference category (Low SLI) at higher odds than other in measuring Child survival status(Table 5).

Table 5: Logit Regression Analysis of Household Environment, Sanitation and explanatory variables influencing Child Survival in Chhattisgarh, NFHS-2

Independent variables	Exp(β)		
	Scheduled Caste	Scheduled Tribes	Others
1. Household Environment factors			
ENF index			
Less than 5	1.000	1.000	1.000
Greater than 5	0.641	1.148	1.369
2. Sanitation Factors			
SAN Index			
Less than 3		1.000	1.000
Greater than 3		1.042	1.534
3. Type of house			
Kucha (ref)	1.000	1.000	1.000
Pucca	1.009	1.583	0.794
4. SLI			
Low (ref)	1.000	1.000	1.000
Medium and above	1.382	0.892	1.060
5. Respondents Literacy			
Illiterate (ref)	1.000	1.000*	1.000
Literate	1.388	1.811	2.156
6. Husband's Literacy			
Illiterate (ref)	1.000	1.000	1.000
Literate	0.639	0.600	1.164
7. Work Status			
Not working (ref)	1.000	1.000	1.000
Working	0.837	0.886	1.265
Constant	1.742	1.210	0.673
Log likelihood	180.980	452.064	616.860
100 x R square	28.0	34.0	68.0

Conclusions:

In this study by considering household environmental factors, sanitation facilities, women literacy husband's literacy, SLI has been considered to know the influence on child survival by different caste in Chhattisgarh. It has been observed that having better environmental factor,

work status of women and husband literacy had influence on child survival status among scheduled caste population than other set of population.

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