

**DEMOGRAPHIC APPROACH FOR DETECTION OF
'COMBINATIONS OF CAUSES' OF LOW CHILD SEX
RATIO IN RURAL MAHARASHTRA (INDIA)**

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Abstract

Women are pioneer of human culture including agriculture, clothing and its prime knowledge. However, millions are escaped before birth using sex determination and selective abortion techniques in patriarchy. About 86% blocks of Maharashtra (India) show child sex ratio (CSR) less than 1000 and block wise average 51 girls are missing. Person's bivariate correlation analysis was used for detection of 'combinations of causes' of missing girls and results are tested at two tailed significance level (0.05 and 0.01).

Key words: child sex ratio; correlation analysis; combinations of causes; clusters

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Introduction

Women are pioneer of human culture including agriculture, clothing and its prime knowledge (Patil, 1982). However, millions are escaped (CSR [0-6years] < 850 girls/1000boyes observed in 49 districts of India) (NIPCCD 2008) before birth using sex determination and selective abortion techniques in patriarchy (Chang and Das-Gupta, 2007, Deka 2008). Now, her marital status is depending upon her motherhood (Mehta and Kapadia, 2008) and birth of son. This issue has been addressed in different studies undertaken in some last decades across the globe i.e. literary studies (Mikulan 2009), community psychology (Campbell and Wasco 2002), education (Lord and Preston 2009), economics (Beneria 1995, Cunningham et al. 2008, Jefferson 2009), administrations, scientific research, etc. They have found no significant difference in capacity of men and women to work in different fields like social responsibilities and personal businesses required different physical and mental abilities. Even, sometimes, women have advantages of her additional characteristics for specialised jobs. Community psychologist and literary studies stated that the women are more socialized and prompt in social responsibilities as compare to male (Zelezny et al. 2000). Gender economists argued that feminist analysis is finally making positive impact in the field of economics (Beneria 1995). In opposite situation, men are more aggressive and overconfident resulted as high risk in some circumstances where, women are safer and have optimal confidant. However, men are more preferred and women more exploited in the modern society (Graham et al. 1998).

‘Sex’ is biological term fixed at birth of the person, but socio-eco-cultural environment decides ‘gender’ after the birth and gender can decide the sex by sex-determination and selective abortion. Therefore, ‘socio-eco-cultural aspects of the society decide the child sex-ratio’. Demographic approach was adopted to detect the ‘combinations of causes’ low sex ration in child population of Maharashtra (India).

Methodology

Study area

Maharashtra is second largest state in India for population accommodate about 967 million (9.4%) [1123 million 2011] population distributed in 35 district and 353 blocks. About 57.8% population is living in 43,722 villages, 42.2% in 251 towns and 7 cities (population about one million). Out of them 10.2% are from scheduled castes (SC) and 8.9% scheduled tribes (ST)

(Table 1). Hindu is dominant religion as compare to Sikh, Muslim, Jain, and Buddhist in the state. Literate population is about 76.9% with high disparity, male (67%) and female (47%) recorded in 2001 census.

Table 1 Block wise average values

	Total	Male	Female
Sex ratio (females/1000 males)	980.8		
CSR (girls/1000 boys)	949.2		
House hold size (persons/house)	5.0		
Child population (%)	15.6		
SC population (%)	10.5		
ST population (%)	18.1		
Literate population (%)	57.0	66.9	46.9
Illiterate population (%)	43.0	33.1	53.1
Workers population (% total population)	51.4	54.8	47.8
Main workers (% of total workers)	78.9	87.0	68.8
Main cultivators (% of total main workers)	48.5	49.5	44.9
Main agricultural labourers (% of total main workers)	33.0	28.3	41.7
Main workers- house hold industries (% of total main workers)		1.7	1.9
Main other workers (% of total main workers)	16.8	20.5	11.3
Marginal workers (% of total workers)	21.1	12.4	5.1
Marginal cultivators (% of total workers)		12.0	5.0
Marginal agricultural labourers (% of total workers)		6.9	18.9
Marginal workers- house hold industries (% of total workers)		0.3	0.9
Marginal other workers (% of total workers)		2.0	2.1

About 42.5% of total population (53.28% of total males and 30.81% of total females) in the state is classified as working population. The percentage of working population is more in rural areas (48.88% total workers, 53.9% male workers and 43.6 female workers) than urban (33.85% total workers, 52.42% male workers and 12.57% female workers). About 28.69 % of total workers in rural areas are cultivators (42.37% male /42.52% females), 37.83% agricultural labourers (30.38% male / 47.43% females), 2.27% workers accumulated in household industries (2.11% male / 2.47% females) and 15.94% other workers (23.15% male / 6.64% females). Male and female workers are equally working on own land. Male shows dominance in other sectors with high income, whereas, females are agriculture labourer where income is very low for hardship. Average household size is about 5 persons.

Maharashtra state is stood forth in India for human development index after Kerala, Panjab and Tamilnadu. The index (0.523) value is estimated more than the national figure (0.472) [National Human Development Report (2001), Government of India]. Sex ratio is decline from 936 (1961) to 922 (2001) [925 (2011)] in total population, 995 (1961) to 960 (2001) in rural area and increased from 801 (1961) to 873 (2001) urban areas. Sex ratio of ST (973) population is more than the SC (952).

Child population (0-6 years) is about 13.6 % of the total population. CSR is indicator of the future trends in sex composition in the society. Population census 2001 reveals that the CSR is declined to 883 (2011) and 913 (2001) from 945 in 1991 where Kerala (India) show positive change (958 to 959) in this period. This female biased situation is not expected in societies where social equality was planned and processed through education in last one and half century.

Data and software used

Village-wise census data (2001) of total population, child population [0-6 years], caste wise distribution (SC [scheduled caste]/ST [scheduled tribe]), literacy, working status of population with male and female for all villages (43722) distributed in different blocks of Maharashtra was used for analyses. The number of male and female population of cultivators was used to understand the property ownership where number of labourer to learn the dependency for income. The population working in house hold industries and other sectors are helpful to understand the transformation of population from primary sector to secondary, tertiary and other sectors. It is indicator of economic development and modernisation. Caste wise distribution is helpful to understand the social status of the families and particular class of the society. The house hold size was used to know the number of persons is living together and child population to willingness for number of child per family. The SPSS (trial version) software is used for estimations of correlations using village wise data at block level. MS Excel was used for block wise data compilation, tabulation and graphical presentations.

Data analyses

Village wise sex-ratios [females/1000 males] for total and child population were calculated separately. Percentage values of SC/ST population (male/female), literacy (male/female/total),

cultivators (male /female), agricultural labourer (male/female), total workers (male and female), workers in house hold industry (male/female), etc. were calculated at village level for standardisation of values. Block (tahsil) wise average values for all these demographic variables were calculated. Block wise average values of CSR were plotted on state map and blocks are classified into five clusters (Figure 1) using classified table data in GIS software i.e. ILWIS Academic 3.4 for practical purposes.

Village wise demographic data for each block was compiled and loaded in separate SPSS data file for correlation analyses. Person's bivariate correlation analysis was performed to calculate the correlation of CSR with the demographic variables in SPSS software. The significance of the estimated correlation values were tested at two tailed significance level (0.05 and 0.01) using automated processes in SPSS. The correlations were estimated at block level using village wise data for demographic variables i.e. child population, sex ratio, house hold size, caste wise population (SC/ST), literacy (male/female/total), cultivators (male /female), agricultural labourer (male/female), total workers (male and female), workers in house hold industry (male/female), etc. The population distribution according to workers, cultivators, agricultural labourers, household industries are considered as major or marginal to understand

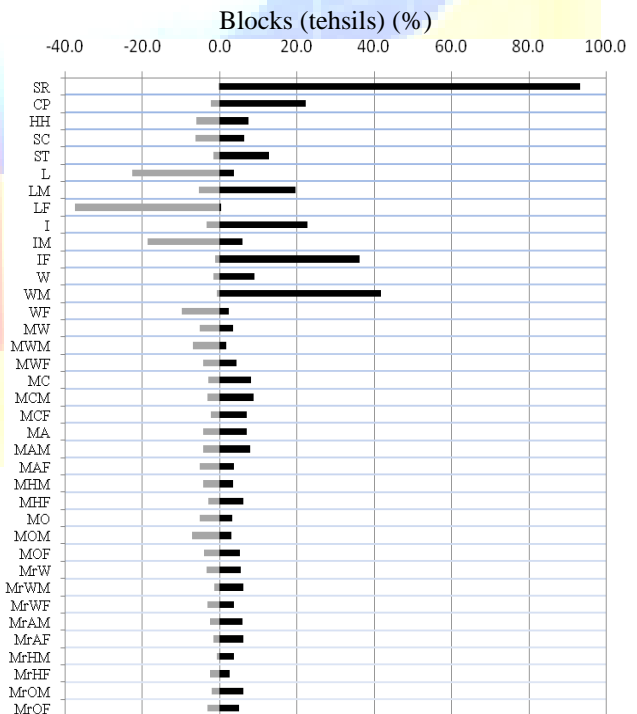
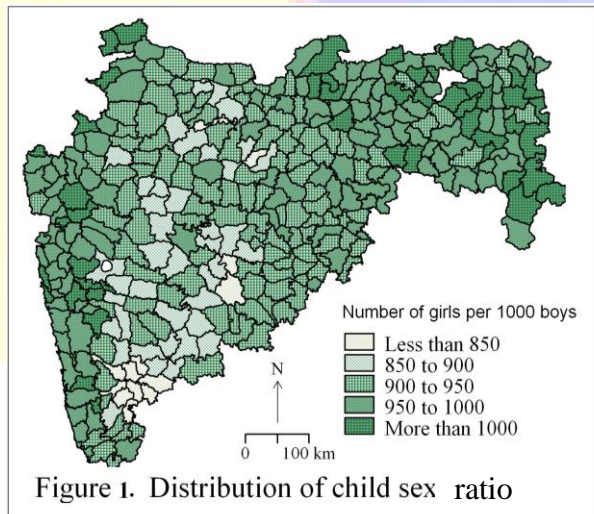


Figure 2. Distribution of blocks by demographic parameters and significant correlation

Code	Descriptions
SR	Sex ratio (females/1000 males)
CP	Child Population
HH	House hold size (persons/house)
SC	SC population (%)
ST	ST population (%)
L	Literate population (%)
LM	Literate male population (%)
LF	Literate female population (%)
I	Illiterate population (%)
IM	Illiterate male population (%)
IF	Illiterate female population (%)
W	Workers population (% total population)
WM	Male workers population (% total male population)
WF	Female workers population (% total female population)
MW	Main workers (% of total main workers)
MWM	Main male workers (% of total male main workers)
MWF	Main female workers (% of total female main workers)
MC	Main cultivators (% of total main workers)
MCM	Main male cultivators (% of total male main workers)
MCF	Main female cultivators (% of total female main workers)
MA	Main agricultural labourers (% of total main workers)
MAM	Main male agricultural labourers (% of total male main workers)
MAF	Main female agricultural labourers (% of total female main workers)
MHM	Main male workers- house hold industries (% of total male main workers)
MHF	Main female workers- house hold industries (% of total female main workers)
MO	Main other workers (% of total main workers)
MOM	Main male other workers (% of total male main workers)
MOF	Main female other workers (% of total female main workers)
MrW	Marginal workers (% of total workers)
MrWM	Marginal male workers (% of male total workers)
MrWF	Marginal female workers (% of female total workers)
MrAM	Marginal male agricultural labourers (% of male total workers)
MrAF	Marginal female agricultural labourers (% of female total workers)
MrHM	Marginal male workers- house hold industries (% of male total workers)
MrHF	Marginal female workers- house hold industries (% of female total workers)
MrOM	Marginal male other workers (% of male total workers)
MrOF	Marginal female other workers (% of female total workers)

the working and economic status of the population. Correlation analyses were performed at state level using block wise average values for these variables to get primary picture of the relationship (Table 2) Block wise significance (0.05 and 0.01) of calculated correlation values (negative or positive) for different variables was compiled and plotted (Figure 2). The number of blocks according to significant correlation was counted for each variable. And percentage of blocks with significant correlation (positive/negative) was calculated to get state level picture of influence (Table 3). The variables i.e. sex ratio, child population, ST population, female literacy, male and female workers, etc. show clear status of influence in formation of CSR whether, it is positive or negative. However, house hold size, SC population, cultivators, agricultural labourers, male workers in house hold industries, male/female other workers are show positive as well as negative relationship. Therefore, the causes and 'combinations of causes' were identified and compiled according to clusters of CSR in five separate tables (table 4,5,6,7 and 8) to get status (positive/negative) of influence in association of causes and level of CSR.

Table 2. Significant correlation of CSR with demographic parameters at 0.01 and 0.05 levels

	Total	Male	Female
Sex ratio (females/1000 males)	0.01		
Child population (%)	0.01		
House hold size (persons/house)	-0.01		
SC population (%)	NR*		
ST population (%)	0.01	NR	NR
Literate population (%)	-0.01	-0.01	-0.01
Illiterate population (%)	0.01	0.01	0.01
Workers population (% total population)	NR	0.01	NR
Main workers (% of total workers)	-0.01	-0.01	-0.01
Main cultivators (% of total main workers)	-0.01	-0.01	-0.01
Main agricultural labourers (% of total main workers)	NP**	0.05	NR
Main workers- house hold industries (% of total main workers)	NC	NR	NR
Main other workers (% of total main workers)	NR	NR	0.01
Marginal workers (% of total workers)	0.01	0.05	NR
Marginal agricultural labourers (% of total workers)	NP	0.01	0.01
Marginal workers- house hold industries (% of total workers)	NP	0.01	NR
Marginal other workers (% of total workers)	NP	0.01	NR
* NR : No relation;			
**NP: Correlation analysis not performed			

Table 3. Distribution of blocks according to demographic parameter and significant correlation

Code	Level of significance					-ve	+ve	Total
	-0.05	-0.01	0	0.05	0.01			
SR	0.0	0.3	6.3	3.7	89.6	0.3	93.4	93.7
CP	1.4	0.9	75.5	9.5	12.7	2.3	22.2	24.5
HH	3.5	2.6	86.5	4.0	3.5	6.1	7.5	13.5
SC	4.6	1.7	87.3	3.5	2.9	6.3	6.3	12.7
ST	1.2	0.6	85.6	5.5	7.2	1.7	12.7	14.4
L	11.5	11.2	73.5	2.0	1.7	22.8	3.7	26.5
LM	3.2	2.3	74.9	7.5	12.1	5.5	19.6	25.1
LF	13.0	24.5	62.2	0.3	0.0	37.5	0.3	37.8
I	2.0	1.4	73.8	11.5	11.2	3.5	22.8	26.2
IM	7.2	11.5	75.5	3.2	2.6	18.7	5.8	24.5
IF	0.6	0.6	62.5	12.7	23.6	1.2	36.3	37.5
W	1.2	0.6	89.3	6.1	2.9	1.7	8.9	10.7
WM	0.3	0.6	57.3	15.9	25.9	0.9	41.8	42.7
WF	4.9	4.9	87.9	1.7	0.6	9.8	2.3	12.1
MW	1.7	3.5	91.4	2.9	0.6	5.2	3.5	8.6
MWM	4.0	2.9	91.4	0.9	0.9	6.9	1.7	8.6
MWF	3.2	1.2	91.4	3.2	1.2	4.3	4.3	8.6
MC	1.7	1.2	89.0	4.0	4.0	2.9	8.1	11.0
MCM	1.7	1.4	88.2	5.8	2.9	3.2	8.6	11.8
MCF	1.4	0.9	90.8	4.6	2.3	2.3	6.9	9.2
MA	1.7	2.6	88.8	4.6	2.3	4.3	6.9	11.2
MAM	1.7	2.6	87.9	4.0	3.7	4.3	7.8	12.1
MAF	3.2	2.0	91.1	2.0	1.7	5.2	3.7	8.9
MHM	3.2	1.2	92.2	1.7	1.7	4.3	3.5	7.8
MHF	2.0	0.9	91.1	2.0	4.0	2.9	6.1	8.9
MO	3.7	1.4	91.6	1.4	1.7	5.2	3.2	8.4
MOM	5.5	1.7	89.9	1.7	1.2	7.2	2.9	10.1
MOF	3.5	0.6	90.8	2.0	3.2	4.0	5.2	9.2
MrW	2.9	0.6	91.1	2.6	2.9	3.5	5.5	8.9
MrWM	0.9	0.6	92.5	4.9	1.2	1.4	6.1	7.5
MrWF	1.7	1.4	93.1	2.6	1.2	3.2	3.7	6.9
MrAM	2.6	0.0	91.6	2.6	3.2	2.6	5.8	8.4
MrAF	1.4	0.3	92.2	4.6	1.4	1.7	6.1	7.8
MrHM	0.6	0.3	95.4	3.2	0.6	0.9	3.7	4.6
MrHF	1.2	1.4	94.8	1.4	1.2	2.6	2.6	5.2
MrOM	0.6	1.4	91.9	3.7	2.3	2.0	6.1	8.1
MrOF	2.0	1.2	91.9	1.7	3.2	3.2	4.9	8.1

Results and discussions

Distribution of child sex ratio

The number of females should be equal to males for social welfare and stability. It is seriously notable that the average CSR is less (949) than the sex ratio (981) underlining the future trends in the population of the state. About 86% blocks shows CSR less than 1000 with block wise average 51 missing girls (Table 3) where, 79% blocks show sex ratio less than 1000 with average 19 women. The average missing girls are more (32) than the women. The block wise average distribution of CSR shows high deviation [807 in Palus tahsil (Sangali district) to 1098 Vaibhavwadi (Sindhudurg district)] with mean 949 and STD 50. Western, northern and central Maharashtra, comparatively progressive regions in education and economical activities have CSR at very dangerous level (less than 900). The blocks distributed in vicinity of the Kolhapur, where, Chhatrapati Shahu was started revolution for equality through education recorded below 850 girls per 1000 boys. These areas have advanced access to the amenities like education, communication, transportation, medical services, market, etc. Konkan, eastern and northern part of the state have comparatively more CSR, where educationally and economically backward classes are living. Most of the areas have dominance of ST population mainly living in mountainous region and have less access to developed region for such amenities.

Sex ratio (in 93.4% blocks), child population (22.2%), scheduled tribe (ST) population (12.7%), male literacy (19.6%), male workers (42.7%), male/female cultivators, male agricultural labourers, marginal workers including agricultural labourers, females in house hold industries and male other workers have clear positive relationship with CSR in the state. However, literacy mainly in females (37.5%), illiteracy in males (18.7%), total female workers including agricultural labourers has significant negative relationship. The causes in the form of combinations with each others are influencing in different nature. Therefore, the 'combinations of causes' were identified and compiled according to clusters (Figure 1) of CSR to get status (positive/negative) and association of influence.

'Combinations of causes' of low CSR

'Combinations of causes' of low CSR are identified using correlation [positive / negative] analysis using village wise census data and tested at 0.05 and 0.01 significant levels.

Cluster: CSR less than 850

About 4% blocks have classified in this category (Table 4). Number of total literate and female literate persons in the village has significant negative relation with CSR tested at 0.01 level observed in 38% and 61% combinations respectively (Table 1). Literate population in combination of house hold size, main other male workers, marginal female workers have significant negative correlation with CSR tested at 0.05 level in this cluster. Population classified as major worker including cultivators (male), other workers (male) and female workers in combination of literate and female literate population have significant negative relation at 0.01 significant level. However, Literate male, main males working in the house hold industries and other female workers also show significant correlation in some blocks.

Table 4. Causes and combinations: cluster 1 (CSR less than 850)

Negative (0.05)	Negative (0.01)	Positive (0.05)	Positive (0.01)
HH/L, L/MOM, L/MrWF, LF/MrW, LM, MHM, MO, MOM/MrOF	L/LF 2, L/LF/MC/MCM, L/LF/MOM, L/LF/WF, LF 3, MrWM, MW/MWM/MWF/MO /MOF	CP, CP/I, CP/MCF/MHM, HH/CP/IM, HH/WM/MWF/MC/MCM, I, IF, IF/MW/MWF, MHF/MrOM. MOF	I/W/WM/MCM, SC, SR 2,, SR/CP/I, SR/CP/I/IF, SR/CP/IF, SR/I/IF, SR/I/IF/MO/MOM/MrOM, SR/IF/MrAM, SR/MHF/MrW/MrAM/MrAF/MrOM, SR/SC/I/IF/WM

High level of sex ratio, child population and illiteracy mainly in females has positive significant relationship with CSR in the villages of low CSR tested at both 0.01 and 0.05 level. General sex rations in combination of main female workers involve in house hold industries, marginal workers mainly agricultural labourers both males and females have significant relationship with CSR.

The number of workers including cultivators (male) shows both negative and positive significant relationship with CSR. However, main male cultivators in combination of literacy mainly in females have negative relationship and positive in combination of illiteracy. The number of population from SC category in combination of sex ratio, illiteracy mainly in female population has positive relationship with CSR.

Cluster: CSR 850 to 900

Literacy mainly in females show significant negative relationship with number of girl child in the village observed in 35% blocks in this cluster tested at 0.01 levels (Table 5). Number of illiterate males in combination of main working population (male and female) and main cultivators (males and females) have significant negative correlation. Main cultivators (males) have negative correlation if they have high number of literate females and female cultivators

Table 5. Causes and combinations: cluster 2 (CSR 850 to 900)

Negative (0.05)	Negative (0.01)	Positive (0.05)	Positive (0.01)
HH/L, HH/MO, I/WF/MWF, IM, IM/MC/MCM/MCF, IM/MWF, IM/MWM, L 3, L/MOM, L/MrWF, LF 3, LF/MOM, LF/MrW, LF/MrWF, LM, MCM, MHF, MHM, MO MO/MrW, MOF, MOM/MrOF, MrW/MrAM/MrAF/MrOF, MrW/MrF, MW, MW/MA/MAM/MAF/MOM, MWM, SC/ST/LF/MAF/MHF, ST/LF/MCF, WF	HH/MW/MWM/MWF, IM 2, IM/MCF, L/LF 7,L/LF/MC/MCM, L/LF/MOM, L/LF/WF 2, L/LM/LF2, L/LM/LF/MHM/MrW F, LF3, LF/MAF,MHF, MrAM MrWF/HF, MrWM 2, MW, MW/MWM/MWF/M O/MOF, MWM, W/WF	CP, CP/I 2, CP/MCF/MHM, CP/MHF/HF, CP/MW/MWM/MW F, CP/WM, DC/LM/MHF/HF, HH/CP/IM, HH/CP/ST/MCM, HH/WM/MWF/MC/MCM, I, I/MC/MCF, IF 3, IF/MC/MCF, IF/MrOF, IF/MW/MWF, IF/WM, IF/WM 2, L/WM/MAF/MrAF, LM/WM/MHF/MOF/MrAF, LM/WM/MrAM, LM/WM/MrWM/Mr AF, MCM/MrHM, MHF, MHF/MrOM, MOF, MrHM, MrOM, MrW, MrW/MrWF, MW, SR/CP/I/IF, SR/I, ST, W/MW/MWM/MWF, W/WF, WM 2, WM/MrHM/MrOM	CP/I/IM/IF, HH/SR, HH/SR/MHF/MrWF, I/W/WM/MCM, IF, MOM/MrOM, MrW/MrAM/Mraf, MrWM, SC,SC/IF/MrAM, SR 17, SR/CP/I, SR/CP/I/IF, SR/CP/I/IF/MC/MCM/MCF, SR/CP/I/IM/IF/MHF, SR/CP/I/IM/IF/MWM/CM/MCM, SR/I/IF 3, SR/I/IF/MO/, SR/IF, SR/IF/MrAM, SR/LM3, SR/MA/MAM/MAF, SR/MC/MCM/MCF, SR/MHF/MrW/MrAM/MrA F/MrOM, R/MHM/MHF/MOF/SR/Mr AM, SR/MrW, SR/SC/I/IF/WM, SR/ST/IF, SR/WM, SR/WM/MHM

have positive if they have high number of illiterate females. Main female cultivators with illiterate male have negative relationship and positive if high number of illiterate females. Otherwise, number of illiterate females in combination of high number of workers (male and female) with more child population has positive relationship. And number of child population in the villages is positively associated with the illiteracy (female), working population (male and

female), male and female cultivators, females working in house hold industries. ST population, house hold size, child population, mail cultivators, illiterate males, females working in house hold industries, marginal female workers is another combination positively associated with CSR.

Population classified as SC and ST have literate females, main female agricultural labourers, females working in house hold industries, main female cultivators have negative relationship and they are illiterate mainly in females, main male workers and marginal male labourers have positive relationship.

Cluster: CSR 900 to 950

Number of female main cultivators associated with high literacy (male/females) has negative relation with CSR exceptions in villages have more SC population (Table 6). Unexpectedly, literacy mainly in female population in combination of workers, main cultivators (male/ female), marginal female workers, workers in house hold industries (male/female), main agricultural labourers, females working as other workers have negative relation with number of girl child in the village. Literate male population from main cultivators and population have more number of agricultural labourers (male and female) have positive relationship. Illiteracy in male population is mainly associated with marginal workers (agricultural labourer). Village wise child population show positive relationship with CSR and this is associated with literate male and illiterate female population, male workers, main and marginal agricultural male labourers and ST population. Independently and in combination of literate female workers, other workers has negative significant relationship with CSR (Chakrabarty, 2005). However, it has positive if literate male population is more in the village.

House hold size is negatively correlated if female literacy is high and male literacy is low and positive if child population is more, illiterate female and ST population is high with more general sex ration. SC population in combination of literate females, female working as other worker, male worker in house hold industries, marginal agricultural labourers show positive relationship with CSR and positive in combination of main agricultural workers including female cultivators and male other workers. ST population have positive relation in blocks classified in this cluster and it is associated with illiterate population (female), workers including main workers and agricultural labourers (main and marginal).

Table 6. Causes and combinations: cluster 3 (CSR 900 to 950)

Negative (0.05)	Negative (0.01)	Positive (0.05)	Positive (0.01)
CP/SC, HH 2, I/MA/MAM, I/MAM/IF/MrAM, IM 4, IM/MA, IM/MrW/MrAM L 7, L/LF, L/MOF2 L/MWM, LF 7, LF/MAF/MOF, LF/MCF, LF/MrHF LM, LM/MOM, LM/W/WF/MWM, MA/MAM/MA, MC, MCM, MHM2/MO/MOM 2, MOF MrAM2, MrHM, MrOF2, MrOM, MrW, MrWM 2, MW, MW/MAF, MWF 2, MWM SC3, SC/IM/MOF/MrH M/SC/L, SC/MO/MOM/ MrW/MrAF/MrOF ST, W/MAW, WF 3, WF/MO/MOM, WM/MO	HH 2, HH/IM, HH/L/LF, I/IM2, IM 9, IM/MrOM, IM/WM, L/LF 6, L/LF/MC/MCM/M CF, L/LF/MrHF, L/LF/MrWF L/LM/LF 2, L/LM/MC/MCM/ MCF, LF13, LF/MrHM, LF/W/WF/MrHF, MA/MAM, MA/MAM/MAF 2, MHF, MHM, MHM/MHF/MrHF ,MrOF, MrOM 2, MrW/MrAF, MrWF, MW/MWF, MW/MWM, MWM, MWM/MA/MAM SC/LF, SC/OF, ST, WF, WF/MW/MWM,	CP, CP/IF/WM, CP/LM, CP/WM, HH, H/IF/MC/MrWM, HH/MrOM, HH/W/WM/WF/MrWM, I, I/IF, I/MCF, I/MWF, IF, IF/MA/MAM/MrOF, IF/MrHF, IF/MrHM, IF/WM 2, L/MC/MrWF, L/MCM, LF, LF/WM, LM 2, LM/MW, LM/W/MC/MCM/MAM/M AF, LM/WM, LM/WM/MA/MAM, MA2, MA/MAM, MAF/MrAF MAM/MrOF, MC/MCM/MCF, MC/MCM/MOF, MCF, MCF/MA/MHM, MCM, MCM/MCF, MHF, MOM, MrAF2, MrAM/MrAF, MrW MrW/MrAF, MrWF, MrWM/MW/MWF2, MWM, SC, SC/I/MA, SC/W/MCF/MrW/MrAM/ MrOM/SR, SR/I/WM, SR/IF/MrOM, SR/IF/W/WM, ST, ST/I, ST/I/IF, ST/IF/MrHM, ST/IM, ST/MrW/MrAM/MrOM, ST/W, W/WM 2, WM 4, WM/MC/MCM/MCF, WM/WHM	HH 2, HH/SR, HH/SR/CP/ST/I/IF/MrHF, I/WF/MC/MCM, IF, LM LM/MHF, LM/MrOF, MCF MrAM, MrWF, RS/WM SR 36, SR/C/I/IF/WM/MA/MAM/ MAF/MHF, SR/CP, SR/CP/CT/I/IM/IF, SR/CP/I/IF3, SR/CP/I/IF/MrAM, SR/CP/I/IF/WM, SR/CP/IF, SR/CP/ST/I/IM/IF/MAM, SR/CP/WM SR/I/IF2, SR/I/IF/MHF/MrOF, SR/IF7 SR/IF/MAM, SR/IF/W/WF, SR/IF/WM, SR/IF/WM, SR/L/LM2,SR/LM6, SR/LM/WM, SR/LM/WM 2 SR/LM/WM/MO/MOM, SR/MC, SR/MHF, SR/MHM, SR/MOF/MrOF 3 SR/MrAM, SR/MrHM/MrHF, SR/MrW, SR/MrWF, SR/MWM, SR/SC, SR/ST, SR/ST/I/IM/MA/MAM SR/ST/MrW/MrWF/MrAM/ MrAF, SR/ST/WM/WF, SR/W/WM SR/WM 4, SR/WM/MC/MCM, SR/WM/MHF, SR/WM/MW/MWF W/MAM/MOM,

Cluster: CSR 950 to 1000

High number of child population in combination of illiteracy mainly in females and literacy in males, workers, male workers, males in house hold industries, marginal workers [male workers, agricultural female labourers], other female workers, main cultivators (male), and ST population has positively association with CSR tested at 0.01 and 0.05 levels (Table 7). Child population in association with illiterate males, main other workers (male /females) have negative relationship.

Table 7. Causes and combinations: cluster 4 (CSR 950 to 1000)

Negative (0.05)	Negative (0.01)	Positive (0.05)	Positive (0.01)
CP 2, CP/IM, HH 2, HH/L/LM/LF, HH/MWF, HH/ST/MHM, I 2, I/WF, IM 3, IM/MAF, IM/MrAF, IM/MrAM, IM/WM, L 5, L/LF 2, L/LM/LF 2, L/LM/MWF/MAF, L/MrHF, LF 7, LF/IF/MHM, LF/MHF/MOM, LF/MOM/MOF/MrHF, LF/MrWF, LF/MWF, LM 2, MA/MAM, MAF, MAF/MHF, MAM, MC, MC/MCM, MCF, MCM, MHM, MHM/MOF, MO, MO/MOM/MOF, MO/MOM/MOF/MrW/MrAM, MO/MOM/MrAF, MO/MOM/MrAM, MOF, MOM, MrAF, MrWF, MrWM, MW/MWM/MWF, MWF, MWM3, MWM/MWF/MOM, SC/IM/MOM, SC/LF, SC/LF/MrWF, SC/LF/MWM, SC/WF, WF, WF/MW, WF/MWF, WF/MWM/MA/MAM, WM,	CP/I/IM, CP/IM/MO/MOM/MOF, HH/IM/WM, I/IM/MA/MAM, IF, IM 10, IM/MW/MWM, L/LF 3, L/LF/MW/MWM, L/LM/LF, LF 9, LF/IM, LF/MA/MAM/MAF, MAF, MAF/MO/MOM, MHM, MO, MOM, MrOM, MrW/MrOF, MW 2, MW/MWF, MWM/MA/MAM/MAF, SC/L/LF/MO/MOM, SC/L/LM/LF/MA/, SC/LF, SR, SR/WM, ST/I/IM, ST/IF, W/WF, WF 2, WF/MC/MCM/MrWF	CP 2, CP/I/IF/MrHM, CP/I/IM/IF/MrAF, CP/I/IM/IF/W, CP/IF/MrOF, CP/L/MrWM, CP/MCM, CP/MrWM, CP/WM/MrWM, HH, HH/IF/MAM/MrHM, HH/MCM/MrOM, HH/SR, H/WM/MHM, I 2, I/IM/IF, I/IM/MOM, I/MA/MAM, I/MrWM, IF2, IF/MA/MAM/MAF, IF/MOF/MrWM, IF/MrAM, IF/W/MCF, IF/WM/MAM, IF/WM/MC/MCM, IF/WM/MrOF, IM, IM/W/MrHF, L 2, LM 5, LM/MCM/MrWF, LM/MrAF, LM/MrOM, LM/WF, MA, MAF, MAM/MrWM/MrWF/MrOM, MCF/MrWM, MCM 2, MCM/MCF, MOF/MrHM, MOM/MrW/MrAM, MOM/MrW/MrWM/MrWF, MrAF/MrOM, MrWF/MrAF 2, MrWM, MrWM/MrOM, MW, MWF, SC, SC/IF/MA/MAF, SC/MAF, SR, SR/LM, SR/LM/MHM, SR/MHM, SR/SC/I/MO, SR/WM, ST2, ST/IF/WM/MAM/MrOF, W, W/HM, W/MWF, WF, WF/MrWM, WM 4, WM/MA, WM/MHF, WM/MO2, WM/MrAM/MrAF	MAM/MAF, CP/WM, HH/SR/WM, HH/SR/WM/MWM/MA, IF/WM/MOF, L/W, LM, LM/WM 2, MrWM, SR 37, SR/CP 6, SR/CP/I/IF/WM, SR/CP/LM, SR/CP/MC, SR/CP/MO/MOM/MOF, SR/CP/MrW, SR/CP/ST/I/IM/IF/MAM, SR/CP/ST/IF, SR/CP/WM/MO/MOF/MrW/MrWM, SR/I/IF, SR/I/IF/MC/MCM/MCF, SR/I/IF/WM, SR/IF 2, SR/IF/MrOF, SR/IF/WM, SR/IF/WM 3, SR/L/LM, SR/L/LM/WM/MC, SR/L/LM/WM/MWF/MC, SR/LM, SR/LM 2, SR/LM/IF/WM, SR/LM/IM/MrOM, SR/LM/MHF/MrW/MrOM/MrOF, SR/LM/WM 3, SR/MA/MAM 2, SR/MC/MCM, SR/MrOM, SR/MW/MO/MOF, SR/MW/MWF, SR/SC/LM, SR/SC/LM/MA/MAM/MAF, SR/ST, SR/ST/I/IF/MO/MOM/MOF/MrOM/MrOF, SR/ST/I/IF/W/WM/MC/MCM/MrW/MrAM/MrAF, SR/ST/IF, SR/ST/IF/WM, SR/ST/MAM, SR/ST/WM/MOF/MrW/MrAF, SR/W/WM, SR/W/WM/MC/MCM/MCF, SR/WM 11, SR/WM/MCF, SR/WM/MHM, SR/WM/MHM/MHF, SR/WM/MrOF, ST/I/IM/IF/W/WM/MC/MCM/MCF, ST/MHF, W, W/WM/MrHM

However, main other workers (male /females) have positive relation in the villages have high general sex ratio. Literate female and illiterate male population have negative relationship with CSR and illiterate females and literate males positive. Literate males in association of main workers including male cultivators, female workers including marginal female agricultural labourers, other workers (male/female) and main females working in house hold industries have positive relation.

House hold size in combination of main workers including mail cultivators, agricultural labourers (male / female), males working in the house hold industries and classified as other workers have positive relation with CSR and literate females, main female workers and ST population have negative.

SC population in association of literate females, main (male/ female) workers and marginal female workers have negative relation and in association of illiterate female and literate males, main agricultural (male/female) labourers. ST population have positive relation with CSR. They have association with illiteracy, workers including agricultural labourers (male/ females), main male cultivators, main and marginal other workers (male/female).

Cluster: CSR more than 1000

Only 15% of the blocks show CSR above 1000. Literacy mainly in female population has negative correlation with CSR tested at 0.01 (26% blocks) and 0.05 levels (Table 8). Literate males have positive relation and illiterate negative. Higher house hold size in combination of literate population mainly females and main males working in house hold industries have negative relation, where in combination of illiteracy in mainly females, high child population, main female workers working as other worker and household industries have positive relationship. High number of child population in villages has positive association with literate male and illiterate female population, mail workers, main male agricultural labourers, marginal female agriculture labourers, main female workers working as other workers and house hold industries, ST and SC population. However, female workers, main female workers in house hold industries, classified as other workers in the villages have high literacy mainly in females have negative relationship. Main male cultivators have negative association with CSR and female cultivators positive. Main agricultural female labourers have negative relation and male workers

positive. Literate male population associated with main and marginal workers and high sex ratio has positive relation with CSR. ST population has positive ratio with CSR testes at both 0.01 and 0.05 levels. They have association with illiteracy, worker population and main female workers. Female workers have negative relation and male workers have positive relation. Main male and female workers working in house hold industries are negatively related with CSR and positively if they are illiterate.

Table 8. Causes and combinations: cluster 5 (CSR more than 1000)

Negative (0.05)	Negative (0.01)	Positive (0.05)	Positive (0.01)
CP, HH/L, HH/L/MHM, HH/LF, IM, IM/WF, L3, L/LF, L/LF/MHF/MOF/MrHF, L/WF, LF, MA, MAF, MC/MCM, MC/MCM/MrW, MHF, MHM, MOM, MrAM, MWM, SC, SC/MO, SC/MrOM/MrOF, W, W/MHM, WF/MrW, WF/MWM	HH/CP, HH/LF, IM4, L/LF 4, L/LF/MOM, LF 6, LF/IM, MO, MrHF, SC, WF 4, WF/MrOF, WF/MW	CP, CP/I/MOF/MrHF, CP/ST/MA/MAM/MrAF, HH, I 2, I/IF/MC/MCF, I/IF/W, I/MA, I/MO/MOM/MOF, I/MrWM, IF, LM, LM/W, MA/MAM, MrAM, MrW, SC, SC/W/MW/MO/MOM, SR/CP, SR/WM/MrHM, ST3, ST/IF/W, ST/WM/MW/MWF, W/WM, WM 4	HH, HH/SR/CP, HH/SR/I/IF/MOF, HH/SR/WM/MrHF, LM, MrHF/MrOM/MrOF, SR11, SR/COP/LM/IF/WM, SR/CP/I/IF/MAM, SR/CP/SC/IF/WM, SR/CP/ST, SR/CP/WM/MOF, SR/I/IF/MAF/MrOF, SR/I/IF/WM, SR/IF 2, SR/IF/WM, SR/IF/WM, SR/IF/WM/MHM/MHF, SR/LM, SR/LM/WM, SR/LM/WM/MrWM, SR/MA/MAM/MAF, SR/SC, SR/SC/WM/MrOM, SR/ST, SR/ST/IF/WM 2, SR/ST/WM, SR/WM 6, ST/IF, WM/MWF

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