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Gender Bias in India's North-Eastern Region: Its Manifestations, Causes and Consequences

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Amidst growing concerns over the persistent deterioration of juvenile sex ratios in India, the possible proliferation of the 'culture' of discrimination in societies hitherto known for egalitarian gender relations within the subcontinent, has been a matter of further uneasiness and disquiet among researchers. This issue, for some reasons, has not been investigated fully for a significant chunk of the population of India, occupying eight states in the North-eastern region of the country. The present research is an attempt towards filling in that void by addressing the issue of gender bias among children, in this ethnically and culturally distinct part of India. Using district level data from large-scale sample surveys and the recent censuses of 2001 and 2011 for India, the present study forays into the primary factors shaping gender bias in child survival in North-east India. Analysis of panel data models reveal that factors generally considered associated with higher female autonomy/status, i.e. female education and female work participation, may not be sufficient for obliterating gender bias in child survival and in fact, may work towards increasing it. Results also suggest that economic deprivation could be a significant factor in increasing relative mortality disadvantage of females. However, cultural features of tribes do provide added protection to females against discrimination in child survival. The study points to the urgency of gender sensitive and gender specific policy, which incorporates economic and social vulnerabilities of women in transitional societies such as North-east India.

Keywords: Female status, Gender bias, Juvenile sex ratio, North-east India, Socio-cultural features, Tribes

1. Introduction and Background

Gender bias, in its multifarious forms, has shown itself to be a particularly stable feature of the socio-cultural fabric of India. The overall sex ratio (OSR) (females per 1000 males) of the Indian population is not only unfavourable towards women in the absolute sense, but it is also more skewed when compared to Europe, North America or even sub-Saharan Africa (Dréze and Sen 1995). In fact, for most of the earlier century, even as the

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OSR showed an increasing trend practically everywhere in the world, India witnessed a steady decline in OSR with each consecutive census starting from 1901. The OSR reached its nadir at around 927 females per thousand males in 1991. (The declining trend seems to have been somewhat arrested of late, as revealed by the slight increases in OSR from 927 in 1991 to 933 in 2001 and further to 940 in 2011).

Perhaps a matter of even greater concern is the continuing fall in the juvenile sex ratio (JSR) (number of females per thousand males in the 0-6 age group) in India and its constituent states. Notwithstanding considerable economic and social development during the last six decades, the recent census of India (2011) revealed a JSR of 914- it's lowest ever level since independence. Not surprisingly, India is one of the only two countries in the world (the other being China), where the infant mortality rate of females is higher than that of males (United Nations 2011). Indeed, India manifests the most profound form of gender bias in denying the basic right to survival, and that to a long and healthy life to the girl child.

This said, the picture is far from uniform across the various regions and states of the country. Whereas the southern states exhibit generally lower levels of gender bias and higher female autonomy, North India is characterised as a region exhibiting the starkest forms of patriarchy, son preference and gender bias in India (Dyson and Moore 1983; Karve 1965; Sopher 1980). However, the depiction of the regional diversity of the subcontinent can hardly be complete without portraying the ethnically and culturally distinct North-eastern Region of India (NER hereafter).

Systematic studies on the trends in the socio-cultural moorings of the people of North-east India and especially changes (if any) in the gender relations/gender bias in these societies have been relatively rare in the past. The few existing studies, concern themselves with specific locations or particular tribes (e.g. Dass 1980; Deb 2010; Fernandes, Pereira and Khatso 2007; Mishra 1999; Nayak 2010; Saikia 2005; Tyagi, Chowdhury, and Banerjee 2000). Indeed, research at the regional level in NER is long overdue, and may throw useful light on the contemporary scenario in gender relations in the region in particular, and among the tribes of India in general.

In this context, the primary object of the present paper is to study the level and trend of gender bias, particularly in the survival and health among children (ages 0-6), and discern some of its causes in the setting of North-east India. Section 2, is devoted to a discussion on the various dimensions of gender bias, and the hypotheses advanced to explain the causes of gender bias in child survival. Section 3 presents the materials and method of analysis adopted for the study. Section 4 contains the main findings. Section 5 discusses the major implications and concludes.

2. Factors Influencing Gender Bias in Mortality and Health among Children: Perspectives and Hypotheses

Gender inequality presents a collection of disparate but interlinked problems, from natality and mortality bias, to unequal opportunities for personal development, and ownership of property and resources (Sen 2001). Indeed, the consequences of gender bias/son preference are often far-reaching and severe, and a particularly distressing outcome of son preference among most South Asian countries is the persistent mortality disadvan-

tage of females (Bairagi 1986; Caldwell and Caldwell 1990; D'Souza and Chen 1980; Faisel, Ahmad and Kundi 1993; Koenig and D'Souza 1986; Sen 1998). One of the major forms of gender discrimination among children involves the skewed distribution of household resources, i.e., food and health care, in favour of males, which in many cases leads to the excess loss of female lives.

Even though it is hard to precisely measure the differences in *nutritional* intake per se between male and female children, it is relatively straightforward to observe the result of such discrimination on anthropometric measures. In the case of Punjab (one of the states in North India with the lowest sex ratios), it was found that while only 3 out of 10 'normal' children were girls, over 7 of 10 severely malnourished children were female (Chatterjee 1990). Similar findings were reported by other researchers as well. For example, Kynch and Sen (1983) observed that, the female/male ratio of malnourished 0-5 year olds was 1.07, which increased to 1.40 if only moderate and severe malnourished were considered and further to 1.59 if severely malnourished were considered alone.

It can also be reasonably argued that longer average duration of morbidity among female children is one of the main reasons for their poor nutritional status, along with the discrimination in food intake. Several studies note a distinctly lower medical expenditure on female as compared to male children in India. For instance, Das Gupta (1987) noted that in the case of a Punjab village, medical expenditure on boys was, on the average, 2.3 times larger than that on girls. Similarly, Ganatra and Hirve (1994), based on their study of a rural area of Pune (Western India), found that among children under 5 years of age, boys were around 2.5 times more likely to receive medical attention when suffering from acute respiratory infection (ARI) and/or diarrhoea than girls, and on average, parents expended around 34 % more monetary resources for the treatment of their male child. Khan and Prasad (1983) noted that in the state of Uttar Pradesh, women generally used traditional methods for healing and relatively more males were treated in the primary health centers in the state.

Several other studies have arrived at similar conclusions (e.g. Arokiasamy 2004; Basu 1992; Levinson 1974; Miller 1997; Pandey et al 2002; Sen and Sengupta 1983) and overall, research on intra-familial resource allocation in India suggests a distinct female disadvantage in both nutrition and health care during the initial years of childhood. Recent large sample surveys corroborate the findings from the micro-level studies. According to NFHS data, at the all-India level, the incidence of malnutrition and micronutrient deficiency (incidence of anemia) was found to be relatively higher among female children. Also, relatively smaller percentages of girls as compared to boys were reported to have been fully immunised, or treated for diarrhoea and acute respiratory infection (ARI). Surprisingly, at the all-India level there has been no clear declining trend in many of these indicators at least since the beginning of the nineties (Tarozzi and

Mahajan 2005).

Interestingly enough, recent estimates indicate that gender discrimination could actually be on the rise in NER; rolling back the earlier trend of relative female *advantage* in nutritional and mortality outcomes among most of the states of the region. Table 1 presents changes in the gender disparity indices of mortality, nutrition and childcare for the period 1998 to 2005, constructed from NFHS data. These indices, based on Sopher's method (Sopher 1974), measure the disparity between male and female children along any particular dimension of well being. For instance, the index of gender disparity in childcare reflects the extent of discrimination against the girl child in receiving full immunization. A positive value indicates bias against females, while a negative value would indicate a relative female advantage. When there is no discrimination between the sexes, the index assumes the value zero. (See Appendix 1 for a full description of the method and the calculation of the various indices).

Table 1. Gender Disparity Indices along Various Dimensions of Well-Being among Children Aged 0-6, NER: 1998-99 and 2005-06

State	Index of Gender Disparity In Nutrition		Index of Gender Disparity In Childcare		Index of Gender Disparity In Mortality	
	1998-99	2005-06	1998-99	2005-06	1998-99	2005-06
Arunachal Pradesh	-0.40	-0.04	-0.63	0.36	-0.10	-0.04
Assam	-0.01	0.10	1.04	-0.17	-0.22	0.10
Manipur	-0.01	0.04	-0.22	0.44	-0.22	0.04
Meghalaya	-0.02	-0.04	-0.11	-0.01	-0.34	-0.05
Mizoram	-0.26	0.04	-0.49	0.41	-0.30	0.04
Nagaland	-0.51	-0.16	0.04	0.03	-0.13	-0.16
Sikkim	-	-	-	0.52	-	-
Tripura	-0.10	0.04	0.95	0.30	-0.62	0.04

Source: Author's calculations from NFHS data

As far as these indices lead us, none of the states of the region exhibited any form of gender bias during the late nineties. In fact, what we come across is a relative female advantage in nutrition, childcare and mortality, which is especially pronounced in the case of the tribal dominated states of Arunachal Pradesh, Meghalaya, Mizoram and Nagaland. Surprisingly, the situation is altogether reversed in many states of the region during the following period. During 2005-06, in around half of the states, the nutritional status of girls was found to be relatively worse as compared to boys, and in nearly all the others, the relative advantage of girls had declined significantly. In fact, the picture is

remarkably consistent with regard to the reversal of female advantage in each of the three indicators of gender disparity. Surprisingly, we find a relative male advantage even in the case of immunization. This is especially alarming as the vaccination and immunization campaigns are sponsored by the Government and do not involve any direct monetary cost on the part of the family.

Everywhere, the extent of gender discrimination is related to the social status of women, India being no exception. In their well-known paper on kinship patterns and demographic behaviour in India, Dyson and Moore (1983) observed the existence of a broad north-south cultural dichotomy in the subcontinent, with the North sunk in a deeply patriarchal mindset (thus according a low social status to women), and the South exhibiting more favourable gender relations (and a relatively higher status of women). The authors noted that women's status was a critical factor in influencing the outcome in many matters including gender bias in child survival. Subsequent studies have repeatedly stressed the pivotal role of women's status/autonomy in shaping fertility and mortality differentials between these two regions, and the relatively lower status of women in North India has been held responsible for the poor performance in mortality outcomes for females (e.g. Basu 1992; Das Gupta 1987; Kishor 1993 among others).

However, the *raison d'être* behind this rather fantastic divide in women's status/autonomy has been a subject of surmise among scholars. Moving closer towards the factors that may have given birth to, and sustained the higher status of women in the South, Bardhan (1974) argues for differences in agricultural technology between the North and South as a possible reason. The wheat growing areas of North India offered a relatively small economic role to women in agriculture compared to the rice growing South (as well as East) India. This might have resulted in the lower economic worth of North Indian women to their families traditionally. In fact, the same argument can be extended for explaining the high status enjoyed traditionally by the women of North-east. Majority of the population customarily (and even now to a considerable extent) practiced the slash-and-burn method of agriculture that involved women to a large extent (but more on this later). Bardhan's thesis found support from subsequent investigations (e.g. Mayer 1999), and the basic point made by his research [that of the role of female work force participation rate (FWPR) in determining women's status and gender bias] was well received by the research community at large. Looking particularly at the relationship between FWPR and gender bias in child survival, we find widespread agreement on an inverse relationship between the two (e.g., Basu and Basu 1991; Kishor 1993; Murthi, Guio and Dréze 1995; Rosenzweig and Schultz 1982, among others), but not without exceptions (e.g. Gulati, 1975).

Another factor closely associated with women's autonomy/status and various aspects of gender bias including that in JSR, is female education. However, there is far less agreement on the effect that this variable exerts on the relative survival rates of female vis-à-vis male children. While some researchers (e.g. Simmons et al 1982) observed that increase in female literacy tends to reduce gender bias in JSR, others (e.g. Das Gupta 1987) have argued that female education leads to an intensification of gender bias in child survival. Still others have suggested that the effect of female education is in fact, parity specific and maternal education reduces the survival rates of higher order female

births but not otherwise (Amin 1990).

Since long, researchers have tried to reconcile these contradictory findings and one such 'solution' is to turn towards the cultural context in which the effect of female literacy is being studied. To be specific, Basu (1992) found that increasing female literacy led to decline in relative survival rates of females in the North but had the opposite impact in the South. This suggests the possibility that female education may not be enough to reduce gender bias in situations where the larger social context is one of severe discrimination against women. In this context, few researchers (e.g. Basu and Basu 1991; Das Gupta 1987) advanced the proposition that higher female literacy may lead to greater gender bias in child survival simply because educated women are more capable of 'manipulating' child survival (assuming of course, that household decisions are dominated by men or at least a strongly patriarchal mindset). Interestingly, even in the case of the direct relationship between gender bias in child survival and female work participation, it has been suggested that women who do not 'work' have more time to discriminate between their children in terms of food allocation and attention during sickness. Gruesome as these hypotheses may appear at first sight, they are no doubt plausible.

However, most of the studies mentioned above also found that even after controlling for higher female work participation and literacy rates (and sometimes even a host of other factors reflecting kinship patterns like marriage exogamy and female age at marriage), Southern India still evinced lower gender bias in child survival. In fact, this has led a part of the research fraternity towards the conclusion that 'culture' cannot be fully captured by socio-economic variables and perhaps is a reflection of intrinsic values and norms that accord different status to women in different societies. Remarkably, there are striking similarities between the Dravidian (southern) population and India's tribal population (including North-east India) in several cultural aspects, especially relating to and reflecting the higher status of women in both societies. In fact, 'the south Indian mainstream people historically (and even now) evince several sociocultural features (e.g. marriage patterns and payments including cross-cousin marriage and bride price) that have traditionally characterised tribal societies in much of India too' (Maharatna 2005: 27).

A matter of rather little doubt but much concern is the so called 'prosperity effect' in India. Even as incomes and consumption levels are rising in the subcontinent, gender bias, especially in childhood mortality is on the rise too. Data from every major source including the census and NFHS indicate that the JSR is skewed to a greater extent in urban areas and among the wealthiest households. Given that the opportunities for discrimination, including access to sex selective methods, could indeed be higher among these populations, this finding perhaps comes as little surprise. In fact, the sex ratio at birth (SRB) reveals a systematic bias with the wealth status of households and according to NFHS data, the SRB declined dramatically with increasing wealth, reaching the lowest value of 854 females per thousand males for births to women in the highest wealth quintile (Kishor and Gupta 2009).

Interestingly, as opposed to opulence, poverty does not show any rigid/systematic relationship with gender bias in child survival. In fact, some scholars (e.g. Chen, Huq, and D'Souza 1981; Das Gupta 1987) have reached the conclusion that poverty may not

be, after all, a deciding factor in such matters. However, a number of studies have found that gender discrimination existed to a lesser extent among poorer households in India (Krishnaji 1987; Miller 1981 among others).

Researchers have tried to explain this phenomenon in several ways. For instance, it has been argued that the lack of gender bias among poorer household may be a result of the fact that they 'simply do not have the resources to discriminate between their children in terms of nutrition, health care and education and therefore, cannot discriminate between their children in the provision of these resources' (Jensen and Ahlburg 1999). In this context, another proposition put forth by researchers is, what we may call, 'equality by dispossession'. That is, the poorest households (like those belonging to the class of landless agricultural labourers), may have very little incentive to discriminate against women. Women belonging to the category of 'poorest of the poor' contribute more or less equally to the household economy and therefore may not face severe discrimination from their families. In fact, in a recent research Arokiasamy and Goli (2012) found that JSR varied inversely with the size of the landholding, and whereas the JSR at the all-India level was 108 males per 100 females for all rural households during 2005-06, it was significantly lower at around 104 among the landless rural families. The households with the largest landholdings (10.1 acres and above) displayed the most distorted ratio of 128 males per 100 females. In fact, a similar argument has been forwarded for tribals as well and landlessness and lack of property rights has been held responsible for the relatively lower gender bias in these societies (Kishor 1993).

3. Material and Method of Statistical Analysis

The response variable in the regression analyses is the district juvenile sex ratio pertaining to the years 2001 and 2011. Table 2 contains the definitions and information on the mean and standard deviation of all the variables included in the study. The main method of statistical analysis involves the estimation of a panel data model for the period 2001 and 2011 that assumes the form:

$$JSR_{dt} = \acute{a}_d + \hat{a}X_{dt} + \tilde{a}_t + \mathring{a}_{dt}$$

Here, JSR_{dt} is the juvenile sex ratio for district d at time t, $\acute{a}_d$ is the district-specific effect, â is a vector of the coefficients, X_{dt} is a vector of explanatory variables, $\tilde{a}_t$ is the time dummy (assuming the value of 1 for 2011 and 0 otherwise), and $\mathring{a}_{dt}$ is the error term. The explanatory variables include male literacy rate, female literacy rate, female work participation rate, early marriage (for females), scheduled tribes, urbanisation, poverty and agricultural labourer.

The choice of the independent variables is constrained by availability of district level data for the North-eastern states. Nevertheless, most of the data relevant for the present study are available from the decennial censuses and have been culled out for the years 2001 and 2011. However, information on poverty, early female marriage and medical facility have been obtained from the District Level Household Surveys for the period 2002-04 and 2007-08. It should also be mentioned here that there was a change in total number of districts in NER, which increased from 77 in 2001 to 87 in 2011 by way of

splitting the existing districts of 2001 (Registrar General, 2011). For the sake of comparability over time, data on the variables for the splitted districts have been combined to form the original unit, wherever necessary (and of course, possible).

Table 2. Definition of Variables and Sample Means, 2001 and 2011

Variable	Definition	2001	2011
Juvenile sex ratio	Number of females per 1000 males in 0-6 age group	965 (17.7)	957 (21.0)
Male literacy	Percent of males age 7 and above who are literate	74.5 (11.7)	84.3 (9.2)
Female literacy	Percent of females age 7 and above who are literate	59.5 (15.2)	69.3 (12.2)
Female work participation	Percent of females in total working population	16.1 (11.5)	37.2 (7.9)
Early marriage	Percent of girls marrying before 18 years of age	18.4 (11.1)	13.5 (8.1)
Scheduled Tribes	Percent of Scheduled tribes in total population	53.8 (37.2)	55.4 (37.1)
Christian	Percent of population adhering to Christianity	36.1 (39.2)	-
Urbanization	Percent of population residing in urban areas	17.4 (15.5)	21.2 (16.4)
Poverty	Percent of household with a low standard of living	52.7 (17.2)	13.0 (11.3)
Agricultural labourer	Percent of agricultural labourers among total main workers	6.6 (5.7)	9.4 (7.0)
Medical Facility	Percent of villages having as ub-centre within 3 kilometers	-	67.9 (21.9)

Sources: Census of India 2001, 2011; International Institute for Population Sciences 2006, 2007, 2010

4. Main Findings

Table 3 presents the main results. After an inspection of the bivariate scatterplots between the dependent and the independent variables for the presence of nonlinearities, we found that all the explanatory variables lend themselves suitably to linear regression analysis. However, nonparametric analysis revealed that the JSR was not distributed symmetrically around its mean and hence we include a logistic transformation of the JSR as the dependent variable.

The first column of table 3 contains the OLS regression results for 2001. Here, we see that the male literacy rate is negative and significant, whereas both female literacy and female work participation are significant with a positive sign, indicating that higher female status/autonomy is inversely related to gender bias in child survival. Contrary to research that finds lower gender bias among the poor, we find that higher poverty leads to intensification of gender bias. In contrast to poverty, the percentage of agricultural

labourers has a positive sign, thus affirming the notion that the motivation (and perhaps the ability) for discrimination against the girl child could stem (at least in part) from the greater utility of sons among those who own land, even in the case of NER. However, without more information on the pattern (size and distribution) of land holdings in the region and its states, this last observation is bound to be tentative and open to further consideration. The percentage of tribes and Christians as well as the urbanisation variable are not significant in this regression.

Surprisingly, the variables measuring male and female education and the female work participation turn out to be significant in the 2011 OLS regression as well, but with their signs flipped, as can be seen from the second column of table 3. This lends some support to the earlier observation regarding gender bias in nutrition and childcare, that perhaps there has been an aggravation of gender bias among the states of NER in the recent past. However, it is best not to draw too many conclusions from the cross-sectional analyses alone, and therefore we turn next to the results of our main model.

The third and the fourth columns of table 3 contain the estimates from the random effects and the fixed effects models respectively. We shall focus on the former, as the fixed effects estimation has not been rewarding in this case. However, this was perhaps expected, and given that, our sample size is not particularly large, the large standard errors have rendered most of the variables insignificant. In any case, the Hausman test suggests that the random effects method would not be misleading for the present analysis, and we concentrate on those results in the next few paragraphs.

The results of the random effects model suggest that even though male education has no effect, female education has a significant impact on the JSR. However, contrary to our expectation, but perhaps not completely unexpectedly, the increase in female literacy leads to an increase in gender bias in child survival. This is perhaps one of the most critical results of the present study and the issues involved here deserve further comment. In fact, a few recent investigations have also reported an inverse relationship between rise in female education and gender bias in child survival in India (e.g. Chakraborty and Sinha 2008; Deolalikar, Hasan and Somanathan 2009; Jha 2006; Singariya, 2012), and at least two plausible explanations (though not necessarily contradictory) have been forwarded to explain this phenomenon. The first concerns itself with the twin tendencies of fertility decline on the one hand, and increase (or at least no decrease) in son preference on the other in India. Female education has been found to be crucial factor in lowering the fertility rate in India (e.g. Basu 1992; Dréze and Murti 2001; Jain and Nag 1986; Sharma and Retherford 1990). However, there is little evidence that it could reduce son preference considerably, so that with declining fertility, there have been sharp increases in the sex ratio at birth and child sex ratios in India (Das Gupta and Bhat 1997). The second explanation of this inverse relationship between female education and gender bias focuses on the two possibly conflicting outcomes of increase in female education. While female education (and in fact, male education too) leads to a loosening of the shackles of tradition by questioning and reassessing the prevailing values of son preference, thus leading to a *preference change*, female education also leads to *technological-constraint-change*, by increasing the knowledge and access to sex-selective technology (Echávarri and Ezcurra 2010). Hence, in situations where the latter effect takes prece-

Table 3. Determinants of Gender Bias in Child Survival in North-east India: Main Results of Regression Analysis (Dependent variable: Juvenile Sex Ratio)

	2001: OLS	**2011: OLS**	**PANEL 2001-2011**	
			GLS-RE	**OLS-FE**
	(1)	**(2)**	**(3)**	**(4)**
Constant	6.9164** (309.2)	6.8460** (160.4)	6.9007** (343.3)	6.9249** (132.6)
Male literacy	-0.0016** (2.73)	0.0011** (2.54)	0.0001 (0.24)	0.0004 (0.13)
Female literacy	0.0012** (2.32)	-0.0010** (3.39)	-0.0004* (1.71)	-0.0006 (0.81
Early marriage	-0.0000 (0.14)	0.0007** (2.07)	0.0002 (1.00)	0.0001 (0.47)
Female Work Participation Rate	0.0007* (1.83)	-0.0007* (1.74)	-0.0003 (1.49)	-0.0004 (1.24)
Scheduled Tribes	-0.0001 (0.69)	0.0001 (1.52)	0.0001** (2.68)	-0.0000 (0.05)
Christianity	0.0001 (0.81)	-	-	-
Urbanization	0.0000 (0.13)	0.0001 (0.60)	0.0001 (0.57)	-0.0003 (0.50)
Poverty	-0.0002* (1.85)	-0.0003 (1.41)	-0.0004** (2.56)	-0.0005 (0.71)
Agricultural labourers	0.0008** (2.70)	0.0004 (0.96)	0.0006* (1.90)	0.0005 (0.19)
2011 time dummy	-	-	-0.1169 (1.56)	0.0300 (0.19)
R^2	0.20	0.28	0.18	0.15
F statistic (p value)	2.40 (0.02)	3.61 (0.00)	-	1.99 (0.06)
Wald, χ^2 (9) (p value)	-	-	24.34 (0.00)	-
Number of observations	76	74	128	128
GLS vs. FE χ^2 (8) (p value)	-	-	5.04 (0.75)	-

Notes: (a) OLS = ordinary least squares, GLS = generalized least squares, FE = fixed effects, RE = random effects

(b) * significant at 10 % level, ** significant at 5 % level

(c) Absolute t-ratios in parentheses

(d) All standard errors are heteroscedasticity robust

(e) The F test and the Wald test are tests of the hypothesis that all coefficients (except for the error) are equal to zero

(f) The GLS vs. FE ÷^{2} is the Hausman test for selecting between the random and fixed effects

(g) The 2011 OLS regression includes the medical facilities variable, but it is not shown in the table due to space considerations. The variable turned out to be insignificant in the analysis.

dence over the former, female education tends to further aggravate gender bias. There is some evidence that this may indeed be the case in NER. Data from the latest NFHS survey (2005-06) reveals that SRB for all last births to women in the childbearing years was extremely skewed in NER, ranging from 809 female births per 1000 male births in Arunachal Pradesh to 944 in Mizoram. Surprisingly, even Meghalaya (the state which is home to the matrilineal tribes of NER), evinced a figure of 877 female births per 1000 male births. Kerala showed the least gender bias among all the states of India and SRB for all last births was relatively high at 973 for the same period.

Remarkably, even though the scheduled tribes variable did not turn out to be important in the cross-sectional analyses, the results from the panel data model indicates that it is in fact, highly significant and is related to lower gender bias. Similar conclusions have been reached by other researchers as well (for instance Chaudhuri and Jha 2011?; Dréze and Murthi 1995; Echávarri and Ezcurra 2010). Interestingly, this variable turns out to be significant even after controlling for a host of socio-economic factors including female work participation, generally considered as one of the primary reasons behind the higher status of tribal women. This points out that there are certain cultural features peculiar to the tribes, possibly related to marriage and kinship patterns, which lead to a relatively higher status of women in these societies.

The poverty variable shows as significantly negative, thus confirming the earlier observation that gender bias among the poorer households in NER is indeed stronger as compared to the wealthier ones. However, results also indicate that gender discrimination is likely to be absent among the poorest strata of society, as indicated by the positive coefficient of the agricultural labourer variable in our analysis.

5. Concluding Observations

There is no shying away from the fact that development efforts in India over the last six decades, have met with little success in bringing any major transformation in the position of women in the socio-cultural arena, and the majority of women continue to exist under the constant threat of gender discrimination throughout their lives. In fact, the present study lends support to earlier research which suggest that the 'idea' of gender discrimination may be piercing through all socio-cultural barriers, and spreading among societies which historically evinced balanced gender relations in India. Much like the situation of increasing gender discrimination observed in South India (Maharatna 2011; Sekhar and Hatti 2010, among others), we find that gender discrimination, especially among children, has made headway in NER, and is becoming increasingly apparent in various indicators of childcare, nutrition and longevity/mortality.

Surprisingly, very little research exists on the issue of gender discrimination in NER, perhaps as a consequence of the general notion of a high status enjoyed by women in tribal societies as such. Of course, the idea of higher female status in tribal societies is not baseless, and indeed founded on earlier painstaking research of several scholars. However, as the present study brings out, even if these 'impressions' are true to a certain extent, considerable changes in gender relations may be underway in this region too. A careful analysis of the various factors affecting gender discrimination in child survival reveals that the situation in NER may not be after all, very different from the rest of India

today, even though physical (and perhaps psychological) isolation had kept NER away from 'mainstream' culture till the recent past. Female education and female work participation do not necessarily lead to lower gender bias in child survival in NER, as indicated by the results of our analyses. Furthermore, even though cultural features of tribals do offer added protection to the social position of women in this region, it too has its limitations. Our results indicate that economic deprivation may be an overriding factor in many cases and in situations of severe gender bias in child survival, poverty aggravates the problem further. However, this last observation also drives home the message that couples have an 'incentive' to prefer sons, clearly marking the presence of son preference in contemporary NER. What is more, data from the latest round of the NFHS (2005-06) found a stronger son preference among the *tribes* of NER compared to their nontribal counterparts, in terms of the proportion of men who want more sons as compared to daughters in their family.

In fact, several scholars have noted an ongoing transformation in various socio-cultural practices among the tribes of NER, which has direct consequences for women's status and gender bias. For instance, while endogamous marriages had been a common feature among a majority of the tribes of the region, the recent trend of 'love' marriages, associated with religious conversion to Christianity, has led to increasing distance between the bride and her natal family. This could possibly imply a diminution of the economic as well as emotional value of daughters and encourage a patriarchal outlook in these societies. Similar changes can be found in other marriage practices as well. As is well known, as against the custom of dowry payment in non-tribal societies, the payment of the bride price among tribals is a formal recognition of the economic value of women to their natal families. However, this feature is fast disappearing from the tribal marriage scene. In fact, the tribes of NER have been switching over to dowry payment as a method of gaining upward social mobility (see for instance Fernandes, Pereira and Khatso, 2007). Under these conditions, it is not very difficult to envisage a situation where the cultural peculiarities of tribes encouraging the relatively high social status of women pass into oblivion in the not so distant future.

Even though hard data are difficult to come by, there is some evidence to suggest that land management and ownership patterns in the region could also be changing, leading to increasing corrosion of the socio-economic foundation of the relatively higher status of women in NER. For instance, in an in-depth analysis of the civil society and gender relations in the state of Meghalaya in NER, McDuie-Ra (2007) noted that among the matrilineal Khasi tribes there has been a shift from common land to private land with a simultaneous change in ownership in favour of males in a large number of cases. 'As women undertake the majority of the labour in the cultivation of common land, especially through *jhumming* (shifting cultivation), the privatization of common land and relegation of *jhumming* to poor quality land has been a major cause of insecurity' (McDuie-Ra 2007: 184).

All this naturally has the rather worrisome outcome of an increase in gender bias, and a decline in the status of women in NER, as seen in the present study. Nevertheless, before closing this discussion, it is pertinent to mention that there have also been several

heartening developments with regard to gender development in the region. For instance, there has been a continuous decline in gender disparity in literacy rates among all the states of the region, without exception. This definitely points to a positive side of the development process in the region. However, as the present study indicates, there is far greater scope for socio-economic upliftment that could, we hope, lead to a weakening of the motivation for gender discrimination. More importantly, this paper suggests that development has to be gender specific and gender sensitive as well. To take a specific case, it is important to understand the traditional pattern of land ownership in the region and any changes therein have to be sensitive to the special requirements of females for maintaining their sustenance and not the least, their social position.

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APPENDIX 1: CALCULATION OF THE GENDER DISPARITY INDICES

The various indices of gender disparity presented in this analysis are based on Sopher's method of measuring disparity in the possession any given characteristic between two groups (Sopher 1974). The two groups in our case, obviously, are males and females in the age group 0-6 years. Mathematically, the disparity index (D_i) can be expressed as:

$$D_i = \log (X_2/X_1) + \log [(P\text{-}X_1)/P\text{-}X_2) \quad (1)$$

In this equation, X_2 is chosen such that it greater than X_1, and P is a constant which generally assumes the value of 100, as the method is especially useful in situations where the variables have been expressed as percentages. This has been mostly the case in our calculations, except for the calculation of the gender disparity index in mortality where P has been taken as 1000, since mortality variables are measured in terms of the number of occurrences per thousand population.

The particular feature of this index which makes it very useful for our analysis is that it is additive in nature and a composite index can be derived from individual indices as follows:

$$Z = (1/n) \text{ “}D_i \quad (2)$$

where, i runs from 1 to n (total number of indices included), and refers to the individual disparity indices.

Specifically, the NFHS presents several measures relating to each of the health related indicators selected in this analysis. Using Sopher's method, we could thus incorporate the information on all these separate measures together usefully to form the following indices:

(a) The index of gender disparity in nutrition: This index includes the percent of children (males or females) underweight, percent stunted and percent wasted.

(b) The index of gender disparity in childcare: This index has only a single component-percent of children (12-23 months old) who have received full vaccination. Even though other indicators of childcare, like the percent of children who have received medical attention during specific ailments (diarrhoea or ARI), are available from NFHS, they vary according to the time of the year that the surveys have been conducted and hence are not comparable overtime (IIPS 2007).

(c) The index of gender disparity in mortality: This includes the infant mortality rate (deaths between ages 0 and 1) and the child mortality rate (deaths between ages 1 and 4).