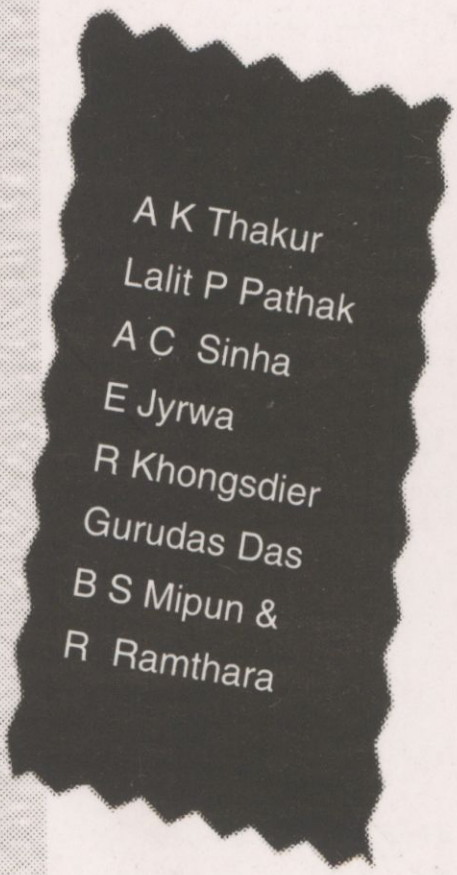
The NEHU Journal



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Editorial

Several readers of *The North-Eastern Hill University Journal of Social Sciences and Humanities* may remember the hard work put in by its editors and the quality of articles published in its issues. Unfortunately, the journal failed to maintain its regularity and seriality due to many reasons one of which was the appointment of the Director of the Publication Cell as the Editor of the journal. As a result, the work of giving the journal a chance to grow and mature was sometimes taken as a routine work, just as headship and deanship, which usually lasts for a period of three years. This arrangement has changed now, with the segregation of directorship of the Cell and the editorship of the journal. One other serious handicap was the vacancy of the post of the Publication Officer for a very long period, which caused enormous difficulty in running the day-to-day activities of the Cell (where the journal is produced) by a teacher who often was holding other charges simultaneously. Now we not only have a full-time Publication Officer, who doubles up as the Associate Editor, but also an efficient Copy Editor in Ms Nabonita Ganguly. With their presence, the journal gets its backbone and its life. Now even if the Editor has to go the journal will not.

With some such happy developments under the guidance of the Vice-Chancellor, Professor Mrinal Miri, we also thought it prudent to open the journal to all branches of knowledge and to name it *The NEHU Journal*. Thus we start the journal with a new name and serial number and pledge to give it a much longer life than its earlier *avatar*. We hope to receive your cooperation in subscribing, contributing (as authors and/or referees), and helping it grow as the most important journal of Northeast India. We wish to make the journal not just a mirror but also the most important forum for discussing the issues that living in this region brings us close to. We desire to make it the very idiom of the region.

T.B. Subba
Editor

CONTENTS

Demographic and Health Traits in Relation to Maternal Education in Northeast India

R. KHONGSDIER

Education is generally considered a key factor of development. It has a profound influence on demographic variables and other indicators of health and nutritional status of a population, or a nation as a whole. Thus it is suggested that the best health development agenda for the developing countries is to increase investment in formal education, particularly in female education.[1] It is believed that female education has a significant impact on maternal and child health as it enhances the knowledge and skills of mothers in health care practices concerning age at marriage, contraception, nutrition, prevention and treatment of diseases.[2] This also means that the higher infant and child mortality rates among the poorly educated mothers are due to their poor hygienic practices and lack of access to modern medical facilities. Moreover, maternal education is related to child health because it reduces the cost of public health programmes relating to information on health technology, increases household income and productivity of health inputs.[3]

Thus education, especiallly female education, is crucial for improving the physical and socio-economic well being of population. It is also vital for national planning in developing countries. It is expected that the increase in literacy rate of a population, or a state, would reduce the fertility and child mortality

rates, or improve the health status of the population as a whole. This paper is an attempt to understand the role of education, especially maternal education, in regulating demographic and health traits fertility, mortality, child health and nutritional status in the Northeastern states of India and to point out the areas that may require further study.

Materials and Methods

The present paper is based on the data collected by the National Family Health Survey (NFHS) during December 1992 to June 1993 in the seven Northeastern state.[4] The NFHS was undertaken as a collaborative project of the Ministry of Health and Family Welfare, Government of India, with different institutes and agencies of which the International Institute for Population Sciences (IIPS) was appointed the "nodal organisation, responsible for providing co-ordination and technical guidance." The data were collected by trained field investigators through intensive interview from a representative sample of 882 married women aged 13-49 years in Arunachal Pradesh, 3006 in Assam, 953 in Manipur, 1137 in Meghalaya, 1045 in Mizoram, 1149 in Nagaland and 1100 in Tripura. More than three-fourth of the heads of households covered under the Survey belonged to tribal communities in all the seven states, except in Assam, Manipur and Tripura. For selection of sample units or villages, the Survey adopted a systematic, multi-stage stratified sampling technique in which the districts, geographical locations, urban and rural settings were taken into consideration in each state.

The information collected consists of: (i) respondent's personal background (like age, marital status, age at marriage, education), (ii) Reproductive history (e.g. number of pregnancies, live births, age, sex and marital status of each offspring, death, age at death, abortion, stillbirth, etc.), (iii) adoption of family planning, (iv) health of children (e.g., breast feeding, vaccinations, causes of recent illness, etc.), (v) fertility preferences (e.g., ideal family size and birth interval, attitude towards family size, etc.), and (vi) husband's

background (related to age, education and occupation) and work status of women. Anthropometric measurements like weight and height were also taken of children aged 0-4 years, following the guidelines given by the United Nations.[5]

Sex Inequality in Education

One of the major interests in recent demographic research is to understand how female education influences demographic transition and public health policies in developing countries. Many studies have revealed that female education is a vital factor responsible for the decline in birth and death rates, improvement in child health, and other development activities.[6] This has led to proposals for expansion of female education with a view to achieving the goals of population policies and the improvement in health status of population. The 1994 International Conference on Population and Development (ICPD) in Cairo has therefore strongly recommended that all countries should take immediate steps to achieve the goal of universal primary education before the year 2015, and to "ensure the widest and earliest possible access by girls and women to sccondary and higher levels of education ..."[7] It is estimated that about 75 per cent of 960 million illiterate persons in the world are women. India is one of the best examples of

Table 1 Literacy rate in Northeastern states

	Illiterate	< Primary	Primary	Middle	High school	High school
Arunachal Pradesh						
Male (n = 2226)	38.1	25.2	14.3	9.2	9.0	4.1
Female (n = 2185)	57.9	19.2	10.9	6.5	4.7	0.8
Total (n = 4411)	47.9	22.3	12.7	7.8	6.9	2.4
Assam						
Male (n = 7853)	30.1	28.6	14.1	13.3	9.4	4.4
Female (n = 7434)	49.3	22.2	11.3	10.3	5.1	1.8

Table 1 Contd.

Total (n = 15287)	39.5	25.5	12.8	11.8	7.3	3.1
Manipur						
Male (n = 2782)	14.9	25.9	14.8	16.6	17.8	10.1
Female (n=2797)	37.0	21.8	11.9	10.9	11.4	7.0
Total (n = 5579)	26.0	23.8	13.4	13.7	14.6	8.5
Meghalaya						
Male (n = 2482)	33.2	29.3	14.5	11.2	9.1	2.6
Female (n = 2377)	39.8	27.9	14.9	9.0	6.7	1.6
Total (n = 4859)	36.4	28.6	14.7	10.2	7.9	2.1
Mizoram						
Male (n = 2632)	6.6	32.7	25.2	16.5	14.6	4.4
Female (n = 2624)	11.1	35.6	23.1	17.0	11.6	1.5
Total (n = 5256)	8.9	34.2	24.1	16.7	13.1	3.0
Nagaland						
Male (n = 2418)	20.1	26.5	18.9	14.2	16.5	3.8
Female (n = 2442)	28.2	24.5	19.2	12.9	13.7	1.5
Total (n = 4860)	24.2	25.5	19.0.	13.6	15.1	2.7
Tripura						
Male (n = 2653)	18.7	32.0	18.1	17.3	8.7	5.1
Female (n = 2678)	35.6	28.6	16.4	12.4	4.4	2.6
Total (n = 5331)	27.2	30.3	17.3	14.8	6.5	3.8

Sources: NFHS, *Northeastern States, 1993*, Population Research Centre, International Institute for Population Sciences, Bombay, 1995, pp. 36-41. NFHS, *Assam. 1992-1993,* Population Research Centre, Gauhati University, Guwahati, 1995, p. 33.

such a country with sex disparity in literacy rate till the last census, despite research evidences of the important role of female education in regulating demographic transition and other socio-economic parameters.

The NFHS estimate of literacy rate for the period 1992-93 in Northeastern states is given in Table 1. The literacy rate is calculated as the number of persons who are able to read and write in any language per 100 persons aged 6 years and above. Table 1 shows that Mizoram distinguishes itself with the highest literacy rate of 91 % followed by Nagaland (76 %), Manipur (74 %), Tripura (73 %), Meghalaya (64 %), Assam (60 %) and Arunachal Pradesh (52 %). According to 1991 Census, the literacy rates in the states of Mizoram, Nagaland, Manipur, Tripura, Assam, Meghalaya and Arunachal Pradesh are 82.3, 61.6, 59.9, 60.4, 52.9, 49.1 and 41.6 per cent respectively, which are lower than the present NFHS estimates.

Table 1 also shows that the literacy rate is higher for males than for females in all states including Meghalaya where female literacy rate is expected to be higher than other states due to the influence of matrilineal system of society. This sex difference in literacy rates is more pronounced in Assam, Tripura, Manipur and Arunachal Pradesh. The female literacy rate is the highest in Mizoram (89 %) and the lowest in Assam (41 %). With respect to educational level, Manipur has the highest proportion of persons who have attained education up to High School and above (23 %), followed by Nagaland (18%) and Mizoram (16%). Thus the high literacy rate in Mizoram is largely due to the large proportion of persons (58%) with only Primary and below Primary levels of education.

Fertility Differentials

Several studies have revealed that female education is more important than paternal education in exerting a negative effect on fertility,[8] though the influence of the latter is also significant in certain studies.[9] Female education is expected to reduce birth rates for the following reasons. First, educated women are likely to have

more voice with regard to lightening the burden of repeated pregnancies because they have more control over household resources and personal behaviour.[10] Second, educated women are likely to be less dependent on their children as a source of social status and old age security, thereby leading to a reduction in the desired family size.[11] Third, educated women have always had higher aspirations for their children, which is conducive to a reduction in a desired family size.[12] Fourth, educated women often have a higher age at first marriage, which affects fertility rate. Fifth, educated women often have a higher adoption of family planning method, despite certain contradictory results.

The important role of female education in reducing fertility in India has also been documented in several studies since the last

Table 2 Age-specific fertility rates (ASFRs) and total fertility rate (TFR) in Northeastern states

Age (group in years)	Arun-achal Pradesh	Assam	Mani-pur	Megha-laya	Mizo-ram	Naga-land	Trip-ura
15 -19	0.115	0.116	0.037	0.079	0.046	0.057	0.085
20- 24	0.246	0.200	0.152	0.182	0.140	0.188	0.166
25-29	0.194	0.195	0.170	0.180	0.143	0.196	0.125
30 -34	0.139	0. I 17	0.128	0.117	0.085	0.131	0.081
35 -39	0.081	0.055	0.057	0.115	0.031	0.059	0.052
40- 44	0.039	0.021	0.010	0.051	0.014	0.015	0.026
45 -49	0.000	0.000	0.000	0.022	0.000	0.006	0.000
TFR	4.25	3.53	2.76	3.73	2.30	3.26	2.67

Sources: NFHS, *Northeastem States, 1993,* Populalion Research Centre, International Institute for Population Sciences, Bombay, I 995, pp.70; NFHS, *Assam.* 1992-1993, Population Research Centre, Guahati University, Guwahati, 1995, pp. 56.

four decades.[13] In Northeastern states, Table 2 indicates the age-specific fertility rates (ASFRs) and total fertility rate (TFR). The ASFR in NFHS is computed by dividing the number of live births in a five year age group by the number of women belonging to the same five year age group during the three year period, whereas TFR is calculated as five times the sum of ASFRs. The TFR is considered one of the best measures of fertility rate that a woman would have during her reproductive life (15-49 years) if she were to experience the prevailing ASFRs during the survey. The TFR in the states of Mizoram (2.3), Tripura (2.7), Manipur (2.8) and Nagaland (3.3) is below the national TFR of 3.4, but it is higher in Arunachal Pradesh (4.3), Assam (3.5) and Meghalaya (3.7). It is also seen that the ASFR reaches its peak when the mothers are aged 20-24 in Arunachal Pradesh, Assam, Meghalaya and Tripura, whereas in Manipur, Mizoram and Nagaland, the highest ASFR is observed when the mothers are in the age group 25- 29.

With respect to the relationship between maternal education and TFR, the data from Assam indicate that the fertility declines drastically with the increasing educational level of mothers. The NFHS estimates of TFR in Assam are 4.51, 3.27, 1.90 and 1.78 in the mothers belonging to the educational categories of illiteracy, Primary, Middle School, High school and above, respectively. Unfortunately, data from other states are not available. However, the NFHS has provided data on the mean number of live births per woman who is currently married according to educational level (Table 3). It is seen from Table 3 that the mean number of live births per woman decreases concomitantly with the increase in schooling level of the mothers. Thus the NFHS data indicate that there is a perceptible decline in ferltility rates even if the mothers are educated only up to primary or below lower secondary level of education. This is true for all the Northeastern states. Although the effect of maternal education on fertility rate (Table 3) is without statistical adjustment for other factors like age of the mother, paternal education, economic condition, etc., it is likely that the lower TFR in Mizoram, Tripura, Manipur and Nagaland is to a certain extent associated with

the higher literacy rate in these states in comparison with that in Meghalaya, Assam and Arunachal Pradesh.

Table 3 Mean number of children ever born to currently married women according to educational level of mothers

	Illiterate	Below Middle	Middle School	High School	Total
Arunachal Pradesh	3.5	2.2	2.1	1.7	3.1
Assam	4:1	3.8	2.5	2.0	3.7
Manipur	4.0	3.5	2.8	2.4	3.4
Meghalaya	3.5	3.2	2.5	2.2	3.2
Mizoram	3.6	3.4	2.6	2.2	3.1
Nagaland	3.5	3.3	2.8	2.5	3.2
Tripura	4.1	3.3	2.2	1.6	3.3

Sources: NFHS, *Northeastern States, 1993,* Population Research Centre, International Institute for Population Sciences, Bombay. 1995, pp.81-82; NFHS. *Assam, 1992-1993,* Population Research Centre, Gauhati University, Guwahati, 1995, p. 67.

Age at Marriage

It is a well acknowledged fact that higher the age at first marriage, lower is the fertility rate. So one of the important effects of female education on fertility is through the age at marriage, which is often higher in the educated women.[14] Table 4 indicates the median age at first marriage according to the educational level of the married women in the Northeastern states. As normally expected, it shows that the median age at first marriage increases with the increasing educational standard of the mother in all states, thereby indicating the important role of maternal education in regulating the age at marriage. Considering the position of the states in respect of literacy rate, the median age at first marriage is by and large higher in Mizoram, Manipur and Nagaland, where literacy rates are relatively

higher than in the other four states. The situation in other states is somewhat different. For example, Arunachal Pradesh, which experiences the highest TFR is expected to have the lowest median age at first marriage. On the contrary, the median age at first marriage in Arunachal Pradesh (18 years) is higher than that in Assam (17 years) and Tripura (17 years), though it is lower than in other states. Thus the NFHS data indicate that the age at marriage is to a great extent influenced by education within each state, but the inter-state differences in age at marriage cannot be explained simply by the differences in literacy rate. Instead, it is likely that the socio-economic factor other than education are also associated with the inter-state differences in age at marriage. With the exception of Arunachal Pradesh, Table 4 indicates that the median age at first marriage is higher in urban than in rural areas for all the states.

Table 4 Median age at marriage (years) among women of age 25-49 by residence and educational level in North-eastern states

Residence/ Education	Arunachal Pradesh	Assam	Mani-pur	Megha-laya	Mizo-ram	Naga-land	Trip-ura
Residence							
Urban	17.1	18.8	21.6	19.8	21.6	20.1	19.0
Rural	18.4	16.8	20.5	18.8	20.6	20.6	16.7
Education							
Illiterate	17.9	15.9	19.5	18.7	19.7	19.8	16.0
< Middle	18.2	17.1	19.9	18.4	20.7	19.7	16.8
Middle	20.3	19.8	20.8	20.4	20.9	20.3	19.3
≤ High School	20.9	24.0	24.2	22.1	24.1	22.5	24.2
Total	18.2	16.9	20.8	19.0	21.0	20.1	17.2

Sources: NFHS, *North-eastern States, 1993*, Population Research Centre, International Institute for Population Sciences, Bombay, 1995, pp.64-65; NFHS, *Assam.* 1992-1993, Population Research Centre, Gauhati University, Guwahati, 1995, pp. 51.

Adoption of Family Planning Methods

Efficient implementation of the family planning programme is recently considered the most important mechanism for bringing about a decline in fertility rate, irrespective of the poor socio-economic development of a country. In this connection, it may be worthy to mention a few lines on the recent decline in fertility rate of Bangladesh, which is neighbouring Assam, Meghalaya and Tripura. According to the World Bank report, the rapid decline of birth rate in Bangladesh is due to the efficient national family planning programme, despite the absence of significant social and economic development.[15] Bangladesh is one of the poorest countries in the world with a per capita income of US $270 in 1997.[16] With a population density of 2,500 persons per square mile in 1997, it is also the most densely populated country in the world. It is about 60 per cent denser than Taiwan, thrice the density of India or Belgium, twice that of South Korea or the Netherlands, seven times that of China and thirty two times that of the United States.[17]

But the successful implementation of a family planning programme with external support since 1973 has brought about a decline of TFR from 6.3 in 1971-75 to 3.3 in 1994-96, which is one decimal higher than that of India in 1994-96.[18] The percentage of contraceptive use among married women aged 10-49 years has risen from 7 per cent in 1975 to 49 per cent in 1997. Thus the Bangladesh fertility transition has recently attracted the attention of many demographers and social scientists interested in understanding the cycle of demographic transition, and the policy makers interested in achieving the goals of population policies. This has also led to the suggestion that the change in levels of social and economic development is less attributable to the success in implementation of family planning programme if sustained political commitment can be "adopted and pursued at the highest levels of government."[19] However, there is also no denying the

fact that Bangladesh has experienced a major social and economic development over the last two decades.[20]

Turning to the Indian situation, it may be noted that the family planning programme has not been uniformly successful, although India has adopted a population policy since 1950s. The prevalence of contraceptive use among the married women aged 13-49 is reported to be only 41 per cent in 1992-93 during the period when the data for the present analysis were collected. The elimination of the method-specific targets, which had been the fundamental parts of family planning in India since 1967, has led to a decline in the adoption of family planning methods. Thus it is argued that the target-free approach precipitated in Cairo ICPD in 1994 seems to be negative for India.[21]

In the Northeastern states, Table 5 shows the percentage distribution of currently married women who have used contraceptive methods. It is seen that there is a great variation within and between the states in respect of the adoption of family planning methods. The prevalence of contraceptive use is highest in Tripura (56 %), followed by Mizoram (54 %), Meghalaya (20 %) and Nagaland (13 %) have recorded the lowest percentage of married women who are adopting family planning methods. Further, there is also a noticeable difference between urban and rural areas within each state in respect of the contraceptive use. The adoption of family planning methods is much higher in urban than in rural areas in all states.

As for maternal education, Table 5 shows that the adoption of family planning methods is to a great extent influenced by maternal education in each state. It is seen that the percentage of contraceptive use increases concomitanly with the rise in education level of mothers in all seven states.

Infant Mortality Differentials

Unfortunately data on the relationship between infant mortality rate and maternal education are not available for each Northeastern state. Table 6 shows only the overall infant and child mortality

rates in all seven states. It is seen that the infant mortality rate, i.e., the number of infant deaths per 1000 live births, is the lowest in Mizoram (15), followed by Nagaland (17), Arunachal Pradesh (40), Manipur (42), Meghalaya (64), Tripura (76) and Assam (89). On the other hand, the child mortality rate, which is calculated as the number of children who died between age 1 and 4 per 1000 live births is the lowest in Nagaland (4), followed by Mizoram (15) and Manipur (20), Meghalaya (24), Tripura (31), Arunachal Pradesh (33), and Assam (59).

Table 5 Percentage distribution of currently married women who are contraceptive users by education and residence

Residence/ Education	Arunachal Pradesh	Assam	Mani-pur	Megha-laya	Mizo-ram	Naga-land	Trip-ura
Residence							
Urban	39.5	62.3	44.3	31.9	57.1	20.6	71.1
Rural	20.8	40.1	30.3	18.0	50.5	10.9	52.4
Education							
Illiteratre	19.9	32.1	30.4	17.0	35.4	6.6	45.0
< Middle	26.4	51.7	35.3	20.1	58.5	16.0	61.0
Middle	27.5	63.7	40.8	30.8	49.4	17.8	66.9
≥ High School	46.9	69.3	41.0	32.0	51.5	20.8	67.8
Total	23.6	42.8	34.9	20.7	53.8	13.0	56.1

Sources: NFHS, *North-eastern States*, 1993. Population Research Centre, International Institute for Population Sciences, Bombay, 1995, pp.100-105; NFHS, *Assam, 1992-1993*, Population Research Centre, Gauhati University, Guwahati, 1995, pp. 85-87.

In comparison with the latest report on infant mortality rates in many Indian states (*The Times of India,* March 5, 2000), Mizoram

has recorded the lowest infant mortality rate in the country. It is lower than that reported for Kerala (16), which is well known for having the lowest infant mortality in the country. With the exception of Assam, Tripura and Meghalaya, the infant mortality rates in Northeastern states are, however, relatively lower than in many other Indian states like Orissa (98), Madhya Pradesh (97), Uttar Pradesh (85), Rajasthan (83), Haryana (69), Bihar (67), Andhra Pradesh (66), Gujarat (64), Karnataka (58), Punjab (54), West Bengal (53) and Tamil Nadu (53).

Table 6 Infant and child mortality rates in Northeastern states for the 5 year period preceding the survey

States	Infant mortality rate	Child mortality rate
Arunachal Pradesh	40.0	33.3
Assam	88.7	58.7
Manipur	42.4	20.2
Meghalaya	64.2	24.3
Mizoram	14.6	14.9
Nagaland	17,2	3.6
Tripura	75.8	31.2

Sources: NFHS, *Northeastern States, 1993,* Population Research Centre, International Institute for Population Sciences, Bombay, 1995, pp.151; NFHS, *Assam, 1992-1993* Population Research Centre, Gauhati University, Guwahati, 1995. p.130.

The lower infant and child mortality rates in Mizoram and Nagaland are as normally expected since these two states are relatively higher in literacy rates, assuming that education has a major role in reducing mortality rates. Such an assumption may however require further evidence to arrive at a conclusion about the negative effect of education on mortality rates. For example, the lower infant mortality rate in Arunachal Pradesh, when compared with states

other than Mizoram and Nagaland, clearly indicates that infant mortality is influenced not only by education but the other social, economic and environmental factors as well. Table 7 indicates the percentage distribution of children who have received vaccinations against the six major diseases, viz., tuberculosis, diphtheria, pertussis, tetanus, polio and measles, during the first year of life. It may be noted that the Government of India has launched the Expanded Programme on Immunisation (EPl) by providing free vaccination services to all children aged 0-5 years since 1979 with a view to reducing the morbidity, mortality and disabilities in the country due to the above mentioned preventable diseases.[22] It can be observed from Table 7 that Mizoram has recorded the highest vaccination coverage for the children during the first year of life, whereas in other states, particularly Nagaland (2%) and Meghalaya (4%), the immunisation programme seems to have made very little progress till the period 1992-93.

Table 7 Percentage distribution of children who have received vaccinations against six major diseases during the first year of life in Northeastern states

States	Age group in months			Total
	12 -23	24 -35	36 - 47	
Arunachal Pradesh	17.5	12.5	8.6	13.0
Assam	17.0	15.5	9.7	14.1
Manipur	25.2	18.0	3.3	15.6
Meghalaya	5.8	6.9	-	4.1
Mizoram	4.5	57.8	46.0	52.9
Nagaland	2.5	1.6	2.4	2.2
Tripura	14.3	9.8	11.3	11.7

Sources: NFHS, *Northeastern States 1993,* Population Research Centre, International Institute for Population Sciences, Bombay, 1995, pp.184-187; NFHS, *Assam,* 1992-1993, Population Research Centre, Gauhati University, Guwahati, 1995, pp. 161.

The highest rate of children immunization in Mizoram seems to be positively related to literacy rate, but the situation is just the opposite in Nagaland where immunization coverage has made no significant progress. Thus education, especially maternal education, may be important in influencing mortality rates. But infant and child mortality rates are also associated with a large number of factors. Mahadevan[23] has given a list of about 200 variables that may influence infant and child mortality. He has classified these variables into 12 broad categories that are known as 'Life Affecting Variables', i.e., the variables which affect not only infant and child mortality, but also the health and morbidity of children. He has also given the list of variables known as 'Imminent Variables' which affect the health and survivorship of children more directly and immediately in comparison with the other variables. Also, Mosley and Chen[24] have suggested a number of proximate variables which are broadly classified into four categories - maternal factors (age, parity, birth interval), environmental contamination (air, food/water, fingers, skin/soil/inanimate objects, insect vectors), nutrient deficiency (calories, protein, micro-nutrients), injury (accidental, intentional), and personal illness control (personal preventive measures, medical treatment) - through which the socio- economic factors like education, income of household, occupation, religion, etc. could have influenced the mortality and morbidity of children. Besides education, these factors may be taken into consideration in order to have a better understanding of the mortality differentials in Northeast India.

Nutritional Status

Nutritional status is defined as a physical expression of the relationship between the nutrient intakes, or bio-availability of nutrients, and the physiological requirements of an individual.[25] There are different techniques of measuring the nutritional status of an individual or a population. They include dietary intakes, anthropometric measurements and indices, biochemical tests and clinical examinations. Of these anthropometry is considered one

of the best techniques of nutritional assessment since body measurements and indices like height, weight, skinfold thickness, weight for age, height for age, weight for height. ete. are highly sensitive to nutrition especially in the case of the young children below 5 years of age. Also, body measurement need not require much technical skills, and are less expensive in comparison with biochemical and clinical techniques. Of many anthropometric indices, weight for age, height for age and weight for height are commonly used as indicators of the nutritional status of children. Weight for age is a measure of the growth in weight at a given age, while height for age is regarded as a measure of linear growth retardation in height at a given age. On the other hand, weight for height is a measure of the body mass in relation to height, and it is considered an indicator of thinness or wasting. These indices are derived from anthropometric measurements in relation to the median of the population reference or standard. In NFHS, children who have the values of these indices below twice the standard deviation of the population reference are considered *undernourished,* while those with the values of below three standard deviations of the population reference are regarded *as severely undernourished.* It may be noted that cellular immunity measures are lower in the undernourished children than in the better nourished ones and thereby the former are more sensitive to many diseases. Consequently, undernourished children often have higher risk of mortality in comparison with the normal children.[26]

Table 8 shows the distribution of undernourished children aged 0-4 years in Northeastern states. It is seen that the prevalence of undernutrition according to weight for age is the highest in Assam (50%), closely followed by Tripura (49%), Meghalaya (46%), and Arunachal Pradesh (40 %). The proportion of children who are underweight varies from 28 to 30 per cent in the states of Mizoram, Nagaland and Manipur. Stunting is highly prevalent in Arunachal Pradesh (54%), Assam (52 %) and Meghalaya (51%), and it is lower in Nagaland (32%) and Manipur (34%). The most serious nutritional problem, which is characterized by thinness or wasting

as indicated by weight for height, is found to be high in Meghalaya (19 %), which is closely followed by Tripura (18%). Children in Mizoram have shown the least prevalence of wasting in comparison with their counterparts in all other states. Considering all the anthropometric indicators given in Table 8, Meghalaya shows the highest prevalence of severe undernutrition, especially in respect of height for age and weight for height.

Table 8 Percentage distribution of undernourished children aged 0-4 years in Northeastern states

States	No.	Weight for age		Height for age		Weight for height	
		< -3SD	< -2SD	< -3SD	< -2SD	< -3SD	< -2SD
Arun-achal	330	14.5	39.7	27.9	53.9	3.6	11.2
Assam	1351	18.7	50.4	26.3	52.2	1.7	10.8
Mani-pur	432	7.2	30.1	16.0	33.6	1.2	8.8
Megh-alaya	354	17.2	45.5	38.4	50.8	4.8	18.9
Mizo-ram	356	5.3	28.1	16.0	41.3	0.6	2.2
Naga-land	432	7.6	28.7	13.2	32.4	2.3	12.7
Tripu-ra	291	18.6	48.8	21.3	46.0	0.7	17.5

Sources: NFHS, *Northeastern States,* 1993, Population Research Centre, International Institute for Population Sciences, Bombay, 1995, pp. 214-216; NFHS, *Assam,* 1992-1993, Population Research Centre, Gauhati Univcersity, Guwahati, 1995, pp. 182.

Concluding Remarks

The role of Christianity in spreading education in the Northeastern

states is well acknowledged.[27] It is also a fact that a majority of the populations in the states of Meghalaya, Mizoram, Manipur and Nagaland is Christian by faith. Christianity in Northeast India arrived first in Meghalaya. But the lower literacy rate in Meghalaya when compared with other Northeastern states is rather surprising. It looks as though the education policy in Meghalaya has failed to achieve its targets concerning universal Primary School Education and Adult Education Programme. However, there has been a dearth of research reports as to why Meghalaya is lagging behind in literacy rate. Or what are the factors responsible for the success of the government education policy in Mizoram? What are the ways and means to improve the existing education policy in Meghalaya and other states with lower literacy rates in Northeast India? These are the moot questions that may need to be answered through multidisciplinary research. Unfortunately, the NFHS has not made any attempt to highlight these problems. Moreover, it is believed that sex bias due to the patrilineal system in society is one of the main factors responsible for higher literacy rate for males in India.[28] The higher rate of males literacy in Meghalaya, where a majority of the population has followed the matrilineal system of society is another research problem for those interested in demography and policy making.

It is obvious from the results presented so far that maternal education emerges as a very important factor in regulating fertility rate, age at first marriage and adoption of family planning methods in all states of Northeast India. The question may therefore arise whether or not the inter-state variation in fertility rate is due to the differences in literacy rate? Considering the case of Mizoram, the answer to this question seems to be affirmative because the state has recorded the highest literacy rate and the lowest TFR. However, the situation may be different if we take into consideration the TFRs in other states. For example, Tripura is in the fourth position in respect of literacy rate and it is in the second lowest position with respect to median age at first marriage, but yet it has experienced the highest percentage of married women who have

adopted family planning methods. Thus the low TFR in Tripura does not appear to be due to education, but it is likely that other factors, especially adoption of family planning methods, are to a great extent responsible for the decline in fertility rate in the state. It is observed that about 45 per cent of the illiterate mothers in Tripura are contraceptive users.

Although the data presented here are devoid of statistical multivariate analysis, it looks as if the Bangladesh model of fertility transition is relevant to the case of Tripura, where fertility rate declines drastically irrespective of lower literacy rate and age at first marriage. To make it clear, let us take into consideration the case of Nagaland where TFR is higher than that in Manipur and Tripura, and it is more or less comparable to Assam and Meghalaya, if not to Arunachal Pradesh. This indicates that family planning programme has gained no momentum in Nagaland, though it has recorded the second highest literacy rate in Northeast India. This is, however, not to claim that education has no role to play in regulating the fertility rate. We have already stressed the importance of education, particularly that of female education. Education along with other socio-economic factors should be taken into consideration while analysing fertility.[29] But for the short-term achievement in fertility decline, efficient implementation of family planning programmes, which involves sustained political commitment and active participation of non-governmental organisations (NGOs), is likely to bring about changes in fertility rates even among the illiterate women.

It has been observed that the infant and child mortality rates in Mizoram, Nagaland, Manipur and Arunachal Pradesh are lower than in the states of Assam, Meghalaya and Tripura. The inverse relationship between education and infant as well as child mortality rates is as normally expected in the states of Mizoram and Nagaland where literacy rates are higher than the other five states (Table 6). It may, however, be pointed out that infant and child mortality rates are also associated with a large number of biological, social,

economic and environmental factors. For instance, the lower infant mortality rate in Arunachal Pradesh when compared with states other than Mizoram and Nagaland, suggests that education is not the only factor. In fact, infant mortality is regarded as a proxy for the socio-economic development of a population or a country as a whole, and it is considered the best indicator of a population's well being since it is associated with different biological, social, economic and environmental factors.[30] It is directly linked with the social and health status of women and children, and it may be considered a reflection or the availability of health facilities and services in all sections of the society. As such, is the lower infant mortality rate in Arunachal Pradesh (as shown by the NFHS) an indicator of better socio-economic status, or better well being of that state in comparison with Assam, Meghalaya and Manipur?

According to Srinivasan[31], "There is an emerging consensus that a population need neither be rich, nor non-agrarian, nor serviced by highly qualified and specialized personnel to enjoy a high expectation of life and low infant mortality rates." Instead, concerted efforts on "few selected programs" of public health policies are required in order to reduce mortality rates and improve child heallh. Of course, several studies have documented the importance of public health services in reducing infant and child mortalily rates.[32] It has been suggested that mortality decline in many developing countries is mainly due to widely distributed public health services like immunization, sanitation, nutrition, information on technologies or preventative and curative services to improve the maternal and child health, etc.[33] On the basis of their study in Nigeria, Orubuloye and Caldwell[34] have suggested that maternal education is likely to have greater effect on infant and child mortality in areas where intensive health care services are available. Similarly a study in Bangladesh indicates that mortality differentials according to maternal education are reduced to a great extent in the area where public health interventions are

intensive.[35] As mentioned earlier, this however does not mean that education is unimportant. Greater investment in education, especially for women, still remains the best agenda for public health policies and other development programmes in developing countries. More the number of educated women, lower will be the cost of public health policies on information concerning preventive and curative services.

The public health services in India are however not uniformly successful as revealed by many studies.[36] In Northeast India, for example, Table 7 shows that immunization coverage varies from 2 per cent in Nagaland to 53 per cent in Mizoram. If we go by the NFHS findings, a higher immunization coverage in Arunachal Pradesh in comparison with Meghalaya, Assam and Nagaland may be associated with its lower mortality, despite the fact that the direct causes of infant death are not only those diseases which are covered under the Universal Immuzation Programme. So, Rozenzweig and Schultz[37] may be right to argue that public health services are a substitute for maternal education in reducing infant and child mortality. Indeed this merits further investigation.

Public health policies are largely dependent on: (I) "the action of a strong central government with reasonably well-educated and co-operative population; or (b) an organised, politically active population with reasonably responsive central government.... Public health policies are not adopted and implemented in a vacuum: they are the outcome of social and political change. The forces of change need to be understood in order for them to be harnessed in the interest of public health."[38] Thus the adoption and implementation of public health policies should be the task of not only the government or its agencies, but also that of the political and social organisations. In other words active participation of the various NGOs is essential for effective implementation of various national policies/health programmes, which is very poor in India. In the United States, "health related social movements have played a major role in both the

legislation and the defeat of important health policies (e.g., fluoridation, promotion of maternal and infant health, health benefits for victims of black lung disease and others)."[39] According to Nag,[40] the lower infant mortality rates in the state of Kerala when compared with that of West Bengal is explained not only by the state intervention in public health services but also by a higher level or political participation or the rural poor, which has, in turn, forced the state government in the post independence era to cater to their health needs. To the best of our knowledge, there is a lack of information on the role of NGOs in influencing the health policies in Northest India.

Turning to nutritional status of children in Northeast India, the prevalence rates of undernutrition are high in many states, especially in Meghalaya, Assam, Tripura and Arunachal Pradesh. Although the NFHS does not provide data on the relationship between economic condition and nutritional status of children, it may be noted that the prevalence of undernutrition declines steadily with the increasing educational level of the mother, and the urban-rural differences are large in the states of Meghalaya, Mizoram, Nagaland and Tripura.[41] In this connection, it may be worth mentioning the review work of Martorell and Ho,[42] which shows that the basic causes of undernutrition in many developing countries are poor socio-economic conditions. In these countries, "poverty is pervasive, and the capacity of families to purchase and/or produce food is limited. Ignorance of the special needs of children and inappropriate cultural beliefs and practices often causes families to give their children diets that are less in quantity and quality than those they could provide. Conditions of environmental sanitation are typically deficient and, combined with limited access to preventive and curative health care, result in high incidences and increased severity if infectious diseases, problems that in turn adversely affect nutrient utilization.." The information related to these issues has been very limited in Northeast India, thereby warranting further investigation to have a better understanding of

the nutritional status of children in Northeast India. Our study on the War Khasi of Meghalaya has revealed that the economic condition of the households has a significant effect on the growth and nutritional status of children.[43]

Besides the above, it is a fact that undernutrition impairs body's defence mechanism and undernourished children are more susceptible to various infections. Several studies in developing countries have revealed that anthropometric indicators of nutritional status are also important predictors of mortality.[44] Mortality rates are always higher in the children with severe undernutrition. The question of how poor nutrition is responsible for infant and child mortality is yet to be clearly understood in Northeast India.

In fine, it appears that education is of considerable importance in regulating the demographic and health indicators in all the Northeastern states. Mizoram distinguishes itself from the other six states in terms of literacy level, fertility and mortality rates. Also, the higher immunization coverage and better nutritional status of children in Mizoram are likely to be associated with the lower infant and child mortality rates. Of course, it merits investigation whether the lower fertility and mortality rates in Mizoram are mainly due to higher literacy level? It is theoretically known that the decline in fertility and mortality is preceded by a rapid increase in per capita income and other socio-economic development. Of all the Northeastern states, Mizoram had the lowest per capita income during 1980s.[45] Thus the present demographic and health indicators in Mizoram are similar to that reported for Kerala during 1980s and 1990s, irrespective of the low per capita income and poor nutritional status. We hope that further studies will throw much more light on this subject. As of now, it appears as if Mizoram would be the best performing state on demographic and health indicators not only in the Northeast but also in India as a whole.

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Book Review

Sustainable Regeneration of Degraded Lands **edited by Jyoti K. Parikh and B.Sudhakara Reddy,** Tata Mcgraw-hill Pub. Co. Ltd., New Delhi, 1997 (IGIDR, CAP21), pp.295 + x, price not quoted on cover.

Land is the most tangible of all natural resources. It is upon land that man has left the imprints of all his cultures and civilisational remains, sufferings and happiness, achievements and failures. It is for land that many a battle has been fought, civilisations rose and perished. And yet, land remains the most contentious of all human affairs. When land as private property emerged with the development of the agrarian civilisation, some ten thousand years ago, considerable amount of land remained as a common resource for the community on which the community has *use* and occasionally, *occupancy* rights. This is often common to all the developing societies where various social groups and communities at different evolutionary phases of their social history, may co-exist. In such societies, rights on *Common Properly Land Resources* (CPLR) are generally accepted concepts of the *community* vis-a-vis the *state* and also, the individual holder of *ownership* rights. Even the developed nations do recognise the *use rights* of citizens over certain forms of environmental or infrastructural resources. This phenomenon is quite common among forest dwellers, quasi-nomads and village communities of India. However in recent times, the traditional use rights of various communities, under various circumstances, over common land resources, have come under severe stress both through the restrictions imposed by an all pervading, sovereign state and the greed of the individual encroachers over common land resources. This has resulted in severe erosion of the livelihood-system of many communities, who traditionally survived on their use rights on the common land resources.

In this light, the contributions of various scholars in a national seminar held at IGIDR, Mumbai in November, 1996 and encapsulated in the current volume is a refreshing departure from the main-stream economics— into an area much neglected but of immense significance to a large number of Scheduled Tribes, castes and village communities through-out the country. The book contains a total of thirteen papers arranged into three parts: Part I dealing with the concepts and status of CPLR, Part II dealing with specific methodologies and Part III dealing with various management practices and alternative institutional arrangements on specific case studies. Majority of contributions, of course, emanate from the CAP21 group of IGIDR.

The first paper by Vijay Laxmi and Jyoti Parikh deals with the concept of CPLR and its current status in India. The second by N.C.Gautam (of NRSA) stresses on the modern methodologies like remote sensing applications to identification of various categories of waste land and to the extent they could be utilised for land regeneration. Iyengar's paper on CPLR in Gujarat points to the modernisation forces that beset the traditional relationships like land encroachment and the possibility of state intervention in parceling the degraded *commons* to co-operatives for land regeneration, as income and employment generating activities. Nadkarni emphasises the revival of the traditional use rights system as an important component of the strategy of rural poverty alleviation in the country. Dixit narrates the travails of the Banni villagers (of Kachchh) where frequent droughts in recent years have degraded the quality of the grasslands, a common property resource and thus affecting their livelihood system.

Part II contains three papers by NTGCF and the IGIDR faculty and largely deals with the economics and methodological innovations in environmental accounting (of case studies from Gujarat and Karnataka) of National Tree Growers' Co-operative Federation Ltd. and demonstrates that many such co-operatives are not only economically viable but remunerative and thus, are

eminently viable enterprises and could be replicated in many such villages with degraded village commons for bettering their livelihood system —a major task that NTGCF has ventured upon.

Drawing extensively upon the Palamau experiments (on village co-operatives), Gopal Kadekodi emphasises the successes of such alternative institutions and management practices (primarily, land co-operatives) and their economic viability in enhancing the quality of life of the villagers. Reema Nanavathy (SEWA) takes an extreme feminist stand by forcefully arguing to hand-over the entire forestry sector to women and under women's management. Riya Sinha's paper, while commenting on various CPLR institutions (NGOs), is of the opinion that 'reward in proportion to effort and contribution' works the best. The study based on six Rajasthan villages by Kanchan Chopra and S.C.Gulati addresses the problems of linkages of CPLR system and stress migration.* The last paper by Reddy, Parikh and Parikh is based on a stakeholders' survey of Mallanhally village that analyses the strengths and weaknesses of the TGCS system adopted.

No doubt, India now is saddled with nearly one third of her land area degraded, either degraded forest land, wastelands or marginal lands, a major part of which falls under CPLR. It needs regeneration and the regeneration process can create millions of man-days of work and employment and economic regeneration of many marginalised communities. Many traditional CPLR management systems are available, many new experiments in the form of JFMCS, TGCS and the Palamau-type land co-operatives are also available. The government has no funds to regenerate all these land on its own (the ventures like the social forestry or NWDB etc.) and the successes of such efforts are limited only, and the

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* Some our own studies on Meghalaya indirectly vindicate the hypothesis that 'ecological degradation in the rural areas has led to distress migration from rural to urban areas'. It may be noted that Meghalaya, like many other North-Eastern states, has a very strong tradition of CPLR.

programmes are not quite cost-effective.

CPLR provides an alternative to such approaches, where the community is the investor and harvester of benefits. The institutional arrangements and management systems could be adopted in such a manner that the ventures truly become 'bankable', i.e., without surviving on doles from public funds. The role of government or NGOs to that extent should be that of a promoter and facilitator, allowing co-operatives to take a plunge in land regeneration as an *economic venture.*

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Urbanization in India: Challenges and Opportunities **by R.P Misra,** Regency Publications, New Delhi, 1998 (NERC-ICSSR, Shillong, Lecture Series), pp.106 +vii, Price: Rs. 175.00 (HB).

The book under review was the outcome of a series of three lectures delivered by Professor R. P. Misra on the same theme on the auspices of the North Eastern Regional Centre of the ICSSR in the annual lectures series in November, 1996 Shillong. The book is divided into six chapters, the first two chapters highlighting the general problematic of urbanisation, the third on evolution of urban system in India, the fourth on urban growth and associated problems in India in recent times, the fifth and sixth constituting a thesis on the future scenario and agenda of India's urbanisation in coming decades and its sustainability. The book is lucidly written, not too cluttered with figures and equations and contains visions to address the ground realities (of the urban dilemma) — food for thought to planners, administrators and students as well.

The UN report on world (1993) clearly states that the future impetus for further urbanisation has to come from the developing countries, since the developed world is an urban civilisation already

and by 2025 AD, of the projected 8 billion world population 5.2 billion will be urban of which the developed will contain only 1.2 billion and the rest (4 billion) coming from the developing ones. This could be a frightening prospect given the resource constraints in developing countries and the magnitude of investment required to provide even a semblance of urban services and infrastructure in these countries.

Public policy interventions in containing urbanisation have generally failed, except under extreme regimentation as was in China where rural to urban migration for long was not permitted without official sanctions. Otherwise, though governments and administrators would wish to intervene — these are futile. Cities are not made — they evolve. They grow because of migration and migrants create accentuated wealth for the cities, build their cultures and make the urban civilisation successful.

One has the lurking fear that Prof. Misra's agenda for the future urban (desirable) situation of India suffers from a prescriptive methodology. He however, acknowledges that the *wired society* of the future on its own volition would perhaps dampen somewhat the impetus on agglomeration economies that industries and services have enjoyed for the past two centuries of industrialism. But this is just a possibility. To what extent can the developing countries transit to *information age* and to what degree and when, remains the moot question. No body would question the wisdom in having cities of more manageable sizes, better managed, disaggregated, decentralised and well integrated with the rural economy of the country —but how to achieve all that? Greater direct public intervention perhaps is no answer.

(a) Contrary to the Gandhian idealism of a prosperous village economy, what we confront is a decadent, moribund village —the city no better. What is needed is not *re- architecturing* the settlement system of the country —an utterly futile exercise, rather a well conceived public policy of larger investments in the rural economy, a sectoral shift of rural economy from primary to secondary and

service activities (— that China did so successfully in the last two decades) and maintaining a steady share of the primary sector in national GDP at about 40 per cent. (It has fallen below 30 per cent in recent times). This means in general, higher productivity in the rural sector and a balanced *terms of trade* between the rural and the urban economies of the country.

(b) A system of incentives and disincentives through fiscal means can be helpful in discouraging industries and new economic ventures coming to larger urban agglomerations and metro-cities. Infrastructural investments in small towns and their physical linkages with the larger urban centres could create counter-forces to further agglomerations in the latter.

(c) A concerted national policy for removal of regional disparities is required so that all further developmental impetuses do not polarise in developed regions alone and developmental forces are well distributed throughout the country, allowing each region to capitalise on its comparative advantages. However, *competitive federalism* may not be a useful way that has been going on after initiation of liberalisation of the economy since 1991. The least developed regions (or states) are likely to lose out in the race and there are little pubic resources available to develop them through setting-up of public enterprise. That this method has failed is no news. Decentralisation and *de-agglomerisation* of the urban system need to be ushered in by market forces calibrated through public policies.

(d) On the front of the cities themselves, it requires more organisation and management from the precarious situation in which the Urban Local Bodies (ULB) are placed, even after five years of enactment of Nagar Palika Act (74th.Constitutional Amendment, 1993). The ULBs require to be more professionally managed, participatory and proactive to market forces, generating resources through well-designed policies of taxation, incentives and disincentives. The market growth would augment their revenues that can be re-invested into further development of the

city. The vast land resources at the disposal of the ULB must be put to productive and revenue yielding ventures. Employment will increase, income of the average city-dweller will increase, so also the wealth of the city. A vibrant and growing rural population will not run to the city for a living. There would perhaps be some answer to the urban problematic in developing countries and hope of a light at the end of the tunnel.

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DECLARATION

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I, T. B. Subba, hereby declare that the particulars given above are true to the best of my knowledge and belief.

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