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HUMAN DEVELOPMENT AND ITS MOBILITY : A STUDY IN SOME SELECTED BLOCKS OF WEST BENGAL

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ABSTRACT

In this paper, we have considered human welfare in the global era as captured by a set of socio-economic indicators. For this purpose we have selected all the blocks of five districts (Howrah, North 24 Parganas, Burdwan, Purulia and Malda) of West Bengal on the basis of ranking in West Bengal Human Development Report (2004) during the two Census points (1991 and 2001). For the analysis, we have considered both an aggregate and disaggregate approach. In the aggregate approach we have constructed a composite Modified Human Development Index (MHDI) for all the blocks of the five selected districts following United Nations Development Programme (UNDP) formula, used for the construction of Human Development Index (HDI). This combined MHDI is a combination of three indices–an index of health outcome, an educational attainment index and an income index. The relevant data are gathered from Census Reports. The temporal movement of this MHDI is noted. For disaggregate analysis, we have used mean-proportions of the socio-economic indicators and their transition across the two recent Census points. The constructed mobility matrices reveal positional movement of the rural areas in this decade.

Introduction

Human endeavour has always searched for welfare that transcends well beyond mere accumulation of wealth. An echo of this is found in the Brihadaranyaka Upanishad where Maitreyi raises a very important question about the problem and prospect of human life. When her husband, sage Yâjñavalkya wanted to give away between his two wives, Maitreyi asked if she could attain immortality with all the wealth of the earth. The sage replies in negative. Then she asked "What should I do with that by which I do not become immortal". This ancient question uttered long ago is still very relevant in today's world (Sen 1999). The aspect of human welfare is a very broad question, not to be ascertained merely by the accumulation of wealth. This is particularly true when we consider welfare of an entire nation. Economists generally try to narrow down the concern to the concept of National Product (NP) or more provocatively per capita national product.

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The quest of a measure that can capture multi-dimensional aspects of human welfare is age old. After a long journey, the Human Development Report by United Nations Development Programme (UNDP) in 1990 was published proposing a single index, Human Development Index (HDI). However, this index receives several criticisms. Since its inception, there is a debate as to how far a unified measure can cover the various aspects of human development that is essentially disaggregated[1] in nature. Nevertheless, it achieved world-wide popularity.

The dynamic aspect of HDI has been a neglected area. Though State level (even district level) Human Development Report has been published, these reports are non-comparable. Disaggregate analysis to capture the dynamics are not widely studied. In this paper, we address these issues. We work out Modified Human Development Index (MHDI) following UNDP formula to investigate the well-being condition of the people of selected blocks of West Bengal. For disaggregate analysis, we apply the mobility literature (Sengupta and Ghosh 2010).

In this paper we have tried to discuss both sides of human development. While suggesting a unique measure and its changes, we have also focused on the movement of its components. Without these two aspects any discussion of human development is inadequate.

Methodology

Towards an Aggregative Measure : Human Development Index (MHDI) tries to capture three dimensions by incorporating a life expectancy index that captures health attainment, an educational index and income index. It is standard practice to use expected life expectancy at birth (ELB), adult literacy rate (LR) and per capita income (PCI) as the most common indices for this purpose. They are combined with proper weight to generate a unique scalar measure- HDI.

To study the human welfare at the sub-district level it is necessary to take into account a set of factors similar to that of HDI. However, all the relevant data are not available at the sub-district (block/municipality) level from the major official source. Hence we are contended with a limited variable set than the HDI. Thus we get the concept of Modified HDI (MHDI). Following Sengupta and Ghosh (2008), we use three indicators for three dimensions of MHDI.

The first important dimension of MHDI is health that is captured by life expectancy at birth. However, these data are not available at any administrative level below the district. Similar is the case for under-five mortality rate that is often used to substitute and/or complement life expectancy. In many cases researchers used health facilities indicators (such as health infrastructure and/or basic household amenities such as access to safe drinking water or sanitation facilities) (Ram and Shekhar 2006; West Bengal Government 2004). However, there are difficulties in assessing their efficacy in fostering health outcomes (such as life expectancy, under-five mortality, checking the spread of preventive diseases etc.). As for example, Ram and Shekhar (2006) have included the water from tap; tubewell, wells etc. as sources of safe drinking water. In the Southern West Bengal, arsenic contamination is a major source of problem that adversely affects the quality of water (West Bengal Government 2004). In such cases underground water from wells, tubewells may not be safe at all. Moreover, when water is supplied by some public authorities (such as municipalities or panchayats), improper maintenance of the supply system may lead to leakage in pipes leading to contamination that makes tap water unsafe. Hence it is better to use some outcome indicator of health[2].

One of the health indicators may be under-five mortality. Economists generally argue that there is an inverse relationship between under-five mortality (and life expectancy in general) and fertility rate (Ray 1998). With lower chance of child survival, families settle for higher fertility and vice-versa. As argued by Ram and Shekhar (2006), "The percentage of population below 6 years is an indirect of the fertility level. In general, its higher proportion leads to a young–age structure i.e., a higher level of young dependency ratio." Thus, we have selected an inverse of this index (1-the index of population below 6 years) to be an indicator of health outcome at the sub-district level.

The second factor–educational attainment–is captured by literacy rate. However, the additional factor for education–enrolment rate–is very unreliable at the block or municipality level (West Bengal Government 2004). Hence, for educational attainment we depend solely on literacy rate[3].

The third factor is an economic one. Ideally one would prefer some measure of sub-district level output or income as in the case of MHDI. Alternatively one suggestion could be the use of the consumer expenditure data, which if explored at the unit level should have given a better result. Unfortunately no such reliable measure is available at the disaggregated level that we are discussing here (West Bengal Government 2004). Thus, it has to be substituted by some measures of employment. We have used the workforce participation data from the Census record that provides distribution of workers and non-workers in different municipalities. These data coincide with other social indicators that have been used by us and hence make it comparable.

A standard argument against the workforce participation rate (WFPR) is that it may include distress living conditions–situations whereby people are forced to work at a lower wage. However, in our case, the argument is weakened because within the State, there remain certain homogeneity in the public policy and/or possibility of migration. Moreover, our analysis is dynamic. Such movement across time rules away most of the ambiguities that might be centred on WFPR.

All the above factors are transformed into one-dimensional index in 0-1 scale using UNDP formula. These are then combined similarly in the case of construction of UNDP - HDI. For all the blocks we thus get three indices : (i) a health index (ii) an educational index and (iii) an income index combined to form the fourth index that may be called Modified Human Development Index (MHDI) because it differs from the UNDP HDI.

UNDP takes pre-specified maximum and minimum values of different dimensions for normalisation. For example, maximum value for adult literacy rate is 100 per cent. It is good if a society can achieve this target. But objective reality may not permit the society to achieve the target. Socio-economic, cultural, political atmosphere or even historical legacy may be barrier to achieve desired level of achievement of any dimension of human development for a society. So, any society will have to fix its own target taking into account its own status. Observed maximum and minimum value of any component is taken for normalisation. Under this normalisation rule, temporal comparison is feasible.

Recently a lot of focus is given to the changes in HDI and its various components over time (Ramirez, Ranis and Stewart 1998; Ranis and Stewart 2000; Ghosh 2006). In order to understand the temporal changes of the MHDI indicators, we have to use some indices that can capture the dynamic changes in human development. It is customary to use growth rate as the relevant index. We consider the growth rate of our suggested MHDI over

this time period. We also consider changes in relative ranking.

The blocks are divided into four ranges: (i) blocks obtaining MHDI value less than 0.3, (ii) blocks obtaining MHDI value 0.3 but less than 0.5, (iii) blocks obtaining value 0.5 but less than 0.8 and (iv) blocks obtaining MHDI value between 0.8 and 1. On the basis of the ranges, blocks are divided into four categories: (i) Very low MHDI, (ii) Low MHDI, (iii) Medium MHDI and (iv) High MHDI, respectively.

Human Development and Disaggregate Analysis : As already noted above, it is necessary to look at a more disaggregated level rather than concentrating merely on a unique number to assess changes in MHDI. In order to study the movements of MHDI and other components of MHDI, mobility analysis has been done. Here mobility tables for Health, Education, Income Index and MHDI are estimated on the basis of relative efficiency scores. However, in order to evaluate changes in human development from the viewpoint of positional objectivity, our first target is to transform these data into a positional objectivity framework. There are several ways in which this can be done. An easy way is to represent individual values as proportion of the group mean (Quah 1993; Ray 1998). These proportions are independent of units and are easily comparable. Secondly, they are pure numbers and hence we can compare across the variables (for example, determine the degree of shortfall according to different parameters). Also shifting them across time-periods it is possible to determine the temporal movement for various units. For this we require the concept of transition probability and mobility matrix.

There are several procedures in constructing transition probability and mobility matrix. We have however used the technique already developed by Sengupta (2000) in his analysis of dynamic efficiency. In any given time period *t*, it is possible to arrange these ratios (e_i^t) into intervals of equal length (d_j^t) starting from the lowest level (lowest value of e_i^t) to the highest ($e_i^t = e_i^{max}$). It is then possible to construct a transition probability matrix or mobility matrix between two time periods *t* and $t+\frac{1}{100}$ with $\frac{1}{100}>0$. The transition probability is defined as:

$$p_{jj'} = Prob\left\{e_i^{t+r} = d_{j'}^{t+r}\, e_i^t = d_j^t\right\} \qquad (1)$$

where $\sum_{j'} p_{jj'} = 1$.

The transition probability ($p_{jj'}$) shows the probability of an observed unit to move from the *jth* class to the *j'*th class during the time span t.

In our case, we first classified the mean proportions into several (not necessarily of equal length)[4] intervals. For example, in the case of income index (Table 5 a & 5 b) we have six intervals (0.5, 0.6, 0.7, 0.8, 0.9 and 1). The transition probabilities are calculated with reference to these intervals. All these transition probabilities together constitute a mobility matrix- *j*th row of it representing the probabilities of an observed unit at interval *j* at time period *t* to move to any other interval (j') at time period $t+\frac{1}{100}$ with first column representing interval 1 at time point $t+\frac{1}{100}$, second representing interval 2 at *t+t* and so on.

Selection of Districts : There are nineteen districts in West Bengal. These districts are well divided into different geographical regions. Some of the districts carry some completely distinct features which are absolutely different from other districts. Even agricultural and industrial sector are not evenly distributed. Some of the districts seriously suffer from water scarcity. On the other hand, there is a district[5] which is called rice bowl of India. There is also wide variation in other aspects of human welfare within the districts. So, this dimension needs to be captured in the study.

To select the study area, we depend on the West Bengal Human Development Report, 2004 published by Development and Planning Department, Government of West Bengal. It is evident from the Report that there is significant difference in the best performing district (in terms of HDI) and the worst performing district. Kolkata[6] ranks first with HDI 0.78 and Malda ranks last with HDI 0.44. This variation confirms our stand that region–specific study of human well-being needs to be conducted.

To study rural perspectives, we selected five districts. We took two best performing districts in terms of ranking excluding Kolkata. These are Howrah and North 24 Parganas, ranked second and third, respectively (Government of West Bengal 2004). Two worst performing districts, Purulia and Malda, ranks 16 and 17 were taken for study. We also took Burdwan, occupying rank 5 for the study. Burdwan is the largest district of West Bengal with the highest number of blocks. Not only that, there are famous agricultural and industrial zones existing in Burdwan[7]. Burdwan is fabulously diverse. It is diverse not only in religion, language and ethnicity. Economy of this district is also diverse. Eastern side of this district is covered by one of the most fertile agricultural tracts in West Bengal (and probably India) whereas western side is one of the oldest industrial areas in India. Thus, Burdwan provides a wide arena for studying human welfare.

These five districts are situated in different parts of the State of West Bengal. All the blocks of these five districts are taken to conduct our proposed rural study. This covers 102 blocks out of 341 blocks of West Bengal.

Analysis

The value of MHDI, Health Index, Education Index and Income Index are provided in the Appendix (Table A.1). The temporal changes of the blocks are given in the Appendix (Table A.2). In Table 1, temporal changes of the blocks in percentage term of MHDI value are presented. It is evident from the Table that all the blocks of all three advanced districts (Howrah, North 24 Parganas and Burdwan) have registered positive change in MHDI value during the decade. There are 86.67 percentage of blocks in Malda having positive change. Equal number of blocks in Malda record 'negative change' and 'no change'. Purulia district shows a poor performance with 60 percentages of its blocks having negative change and 40 percentages of blocks having 'positive change' in MHDI value during the decade.

Table 1: Temporal Changes of Blocks (in Percentage) in MHDI Value, 1991-2001

Category	Howrah	North 24 Parganas	Burdwan	Purulia	Malda*
% of Blocks having positive change	100	100	100	40	86.67
% of Blocks having negative change	0	0	0	60	6.67
% of Blocks having no change	0	0	0	0	6.67

*Note : The fractional figures are used so that the total adds up to 100.

Source : Authors' Calculation.

Table 2 describes the categorisation of all the blocks. It is clear from the Table that Purulia and Malda districts are the worst performer during the time period. 100 per cent blocks in Malda district belong to the Very Low MHDI and Low MHDI category in 1991[8].The situation has slightly improved. in 2001 with a slight improvement, more than 93 per cent blocks belong to these categories. There is not a single block in Howrah, North 24 Parganas and Burdwan are in the Very Low MHDI category in both the time period except in North 24 Parganas where 32 per cent blocks belong to the Very Low MHDI category. One interesting result is that not a single block is in the High MHDI category in both the time periods. Only exception is to the Howrah district where 7 per cent blocks in 2001 are in the High MHDI category.

Table 3 shows the ten consistent leading and laggard blocks during the two time periods[9]. All the three consistent leading blocks are situated adjacent to the Kolkata Metropolitan Area. These blocks have been able to exploit the facilities of urban area. All the six consistent laggard blocks are in Malda district.This is consistent with the West Bengal Human Development Report, 2004.

Table 3 : Categorisation of All the Blocks (In Percentage)

Category	1991					2001				
	Howrah	North 24 Parganas	Burd-wan	Purulia	Malda	Howrah	North 24 Parganas	Burd-wan	Purulia	Malda
Very Low MHDI	0	32	0	15	80	0	0	0	10	46.67
Low MHDI	71	45	45	55	20	14	27	16	85	46.67
Medium MHDI	29	23	55	30	0	79	73	84	5	6.67
High MHDI	0	0	0	0	0	7	0	0	0	0.00

Source : Authors' Calculation.

Table 3 : Ten Consistent Leading and Laggard Blocks over the Two Time Periods

Category	Blocks
Ten Consistent Leading Blocks	Bally – Jagachha (Howrah), Barrackpur-II (North 24 Parganas), Barrackpur-I (North 24 Parganas)
Consistent Laggard 10 blocks	Harischandrapur -II (Malda), Ratua-I (Malda), Harischandrapur –I (Malda), Chanchal-II (Malda), Ratua-II (Malda), Kaliachak-II (Malda)

Note : Number in parentheses indicate the name of the district where concerned block belongs to.

Source : Authors' Calculation.

Disaggregate Analysis of MHDI and its Components for All The Districts from a Common Platform : Until now, we have discussed the partial mobility scenario of each district separately. This is useful to bring in the intra-district mobility. However, now we focus on the movement from a common platform– an envelope of the individual districts. Such an enveloping measure helps us to discern the inter-block comparisons across the districts.

Health Index

The mobility Table for Health Index is provided in 4. The probability for the blocks belonging to the lowest category to remain at the same position is 0.451. For the same category, the probability to move to the higher category, 0.6, 0.7 and 0.8 respectively, are 0.235, 0.216 and 0.098. The probability for 0.6 category to move down to the lowest category is 0.038. For the same category, the probability to move to the higher categories 0.7 and 0.8 are 0.308 and 0.654, respectively. The probability to remain at the same position for 0.7 and 0.8 category are 0.0714 and 0.333. The probabilities for the 0.7 category are 0.7143 and 0.2143, respectively to move to the 0.8 and 0.9 category. However, for the 0.8 category the probability is 0.167 to move to the lower category 0.7. The probability is 0.5 for the same category to move to the immediate higher category. The elitist blocks belonging to the 0.9 and 1 category are able to maintain their position with 100 per cent probability.

Table 4 : Relative Mobility Table of Health Index

			2001			
1991—>	0.5	0.6	0.7	0.8	0.9	1
0.5	0.451	0.235	0.216	0.098	0.000	0.000
0.6	0.038	0.000	0.308	0.654	0.000	0.000
0.7	0.000	0.000	0.0714	0.7143	0.2143	0.000
0.8	0.000	0.000	0.167	0.333	0.500	0.000
0.9	0.000	0.000	0.000	0.000	1.000	0.000
1	0.000	0.000	0.000	0.000	0.000	1.000

Source : Authors' Calculation.

Education Index

Table 5 shows the mobility Table for education index. The probabilities to remain at the same position are 0.90, 0.429, 0.27, 0.64 and 0.60 for the lowest to highest category, respectively. The first category demonstrates almost status- quo situation. There is very little probability of 0.06 and 0.04 for the lowest category to move to the 0.6 and 0.7 categories, respectively. The probability is 0.60 for the blocks belonging to the highest category to maintain their position. Forty per cent blocks of this category move down to the immediate lower category. Hundred per cent blocks of 0.9 category move to the immediate lower category, 0.8. The probability is 0.09 and 0.27 for the 0.8 category to move to the 0.7 and 0.9 category, respectively. The probability for the 0.8 category is 0.09 to move

down to the 0.7 category while the probability is 0.27 to move to the 0.9 category. There is 60 per cent probability for the 0.7 category to move to the 0.8 category and the probability is 0.13 to move to the 0.6 category for the same category. The 0.6 category has the probability of 0.476 to move to the immediate higher category, 0.7 while the probability is 0.095 to move down to the 0.5 category.

Table 5 : Relative Mobility Table of Education Index

			2001			
1991—>	0.5	0.6	0.7	0.8	0.9	1
0.5	0.90	0.06	0.04	0.00	0.00	0.00
0.6	0.095	0.429	0.476	0.00	0.00	0.00
0.7	0.00	0.13	0.27	0.60	0.00	0.00
0.8	0.00	0.00	0.09	0.64	0.27	0.00
0.9	0.00	0.00	0.00	1.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.40	0.60

Source : Authors' Calculation.

Income Index

Table 6 describes the mobility table of Income Index. The picture is very frustrating. The blocks belonging to the elitist category cannot retain their status. The probability to move down to the 0.5 and 0.9 category for the highest category is 0.67 and 0.33, respectively. There is 100 per cent probability for the 0.8 category to move down to the immediate next category. The 0.7 category also demonstrates depressing results. The probability for this category to move to the 0.5 and 0.6 category is 0.60 and 0.20, respectively. There is 50 per cent probability to move down to the first category for the blocks belonging to the 0.6 category. For the same category, the probability is 0.125 each to move to the 0.7 and 0.8 category. There is very little probability of 0.18, 0.04 and 0.01 for the blocks belonging to the first category to move up to the 0.6, 0.7 and 0.01 category, respectively. The probability for the status quo position is 0.76, 0.250 and 0.20 for the consecutive first three categories, respectively.

Table 6 : Relative Mobility Table of Income Index

			2001			
1991—>	0.5	0.6	0.7	0.8	0.9	1
0.5	0.76	0.18	0.04	0.01	0.00	0.01
0.6	0.500	0.250	0.125	0.125	0.00	0.00
0.7	0.60	0.20	0.20	0.00	0.00	0.00
0.8	0.00	0.00	1.00	0.00	0.00	0.00
0.9	0.00	0.00	0.00	0.00	0.00	0.00
1	0.67	0.00	0.00	0.00	0.33	0.00

Source : Authors' Calculation.

Modified Human Development Index

The mobility Table for Modified Human Development Index is shown in Table 7. The probability to remain at the same category is 0.62, 0.36, 0.39, 0.20 and 0.50 for the first to last category. The probability for the blocks belonging to the first category to move to the 0.6 and 0.7 categories are 0.16 and 0.22, respectively. The second category (0.6) has the probability of 0.23 each to move to the 0.7 and 0.8 category. The same category has the probability of 0.18 to move down to the 0.5 category. The probability to move down to the 0.6 category is 0.11 for the blocks belonging to the 0.7 category. The same category has the probability of 0.28 and 0.22 to move up to the 0.8 and 0.9 categories. The blocks belonging to the 0.8 category has the probability of 0.11 and 0.22 to move down to the 0.6 and 0.7 categories. The same category has the probability of 0.17 to move to the 0.9 category. Two higher most categories demonstrate a bleak performance as most of the blocks of these categories cannot retain their position. The probability is 0.80 for the blocks belonging to the 0.9 category to move down to the 0.8 category. There is 50 per cent probability for the blocks belonging to the highest category to move down to the 0.9 category.

Table 7 : Relative Mobility Table of Modified Human Development Index

	2001					
1991—>	0.5	0.6	0.7	0.8	0.9	1
0.5	0.62	0.16	0.22	0.00	0.00	0.00
0.6	0.18	0.36	0.23	0.23	0.00	0.00
0.7	0.00	0.11	0.39	0.28	0.22	0.00
0.8	0.11	0.11	0.22	0.39	0.17	0.00
0.9	0.00	0.00	0.00	0.80	0.20	0.00
1	0.00	0.00	0.00	0.00	0.50	0.50

Source : Authors' Calculation.

Mobility Indices

Comparing the MHDI and its various components, we get a bleak picture. We have provided the Rawlsian and Elitist partial mobility indices[10] in Table 8. The Rawlsian mobility measures the transition probability from the least performed blocks in 1991. Weak negative includes the possibility of staying at the same block in 2001 also. In strict positive sense, an improvement in position is a must. Netting is a difference between the two (Strict Positive-Weak Negative). The Elitist indices give the same value for the highest achieved blocks. In almost all the aspects, except health, Rawlsian Net Mobility is negative. In health index, though it is non-negative, it is very low. Even the elitists do not fare well. Again except health, in other aspects, their performance is below par. For income it is negative and for MHDI it is zero. Thus, the overall picture is as bleak. The time period considered here coincides with the era of globalisation. It is revealed from the analysis that globalisation has stamped down the pace of human development.

Conclusion

In this paper we discussed various aspects of human development at the block level of our selected districts. We see wide variation among them. The inter-district analysis shows that Purulia and Malda are the worst performing districts in terms of MHDI achievement. Malda is the worst performer with 100 per cent of its block low or very low categories. In 2001, 93.33 per cent blocks of Malda are in the low or in the very low categories. Purulia is the second worst. Comparing 1991 and 2001, there is an improvement that a greater percentage of blocks are placed in medium MHDI as compared to 1991. Moreover, none of the blocks are placed in High MHDI, except 7 per cent blocks of Howrah in 2001. The only exception to generally highly acclaimed trend is Purulia where we see a fall in the percentage of medium MHDI from 30 to 5 per cent.

The mobility analysis reveals more concrete picture which is not captured in aggregate analysis. The blocks within same district perform differently. This ascertains our view of partial analysis. The need to carry out study for the below district level is confirmed as well through this approach. Every performance depicted in partial analysis needs to be taken into account at the policy level.

Table 8 : Mobility Indices of the Districts

	Positive and Negative Mobility Indices	
	MHDI	All Selected districts
Rawlsian	Strict positive	0.38
	Weak negative	0.62
	Net	-0.24
Elitist	Weak positive	0.5
	Strong negative	0.5
	Net	0
Health Index		
Rawlsian	Strict positive	0.549
	Weak negative	0.451
	Net	0.098
Elitist	Weak positive	1
	Strong negative	0
	Net	1
Education Index		
Rawlsian	Strict positive	0.1
	Weak negative	0.9
	Net	-0.8
Elitist	Weak positive	0.6
	Strong negative	0.4
	Net	0.2
Income Index		
Rawlsian	Strict positive	0.24
	Weak negative	0.76
	Net	-0.52
Elitist	Weak positive	0
	Strong negative	1
	Net	-1

Source: Authors' Derivation.

Appendix

Table A.1 : MHDI and Other Components of MHDI for all the Blocks

District	Block	Health Index		Education Index		Income Index		MHDI (Value)		MHDI (Rank)	
		1991	2001	1991	2001	1991	2001	1991	2001	1991	2001
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Howrah	Udaynarayanpur	0.739	0.880	0.701	0.763	0.230	0.529	0.557	0.724	13	5
Howrah	Amta-II	0.580	0.783	0.692	0.763	0.085	0.345	0.452	0.630	41	22
Howrah	Amta-I	0.638	0.806	0.683	0.770	0.097	0.525	0.472	0.700	35	9
Howrah	Jagatballavpur	0.560	0.722	0.726	0.706	0.150	0.529	0.478	0.652	34	14
Howrah	Domjur	0.662	0.802	0.743	0.786	0.148	0.533	0.518	0.707	27	8
Howrah	Bally-Jagachha	1.000	1.000	1.000	1.000	0.221	0.563	0.740	0.854	1	1
Howrah	Sankrail	0.762	0.850	0.759	0.802	0.135	0.497	0.552	0.716	16	7
Howrah	Panchla	0.487	0.680	0.603	0.702	0.081	0.514	0.390	0.632	57	21
Howrah	Uluberia-II	0.421	0.668	0.598	0.638	0.028	0.187	0.349	0.497	71	59
Howrah	Uluberia-I	0.378	0.621	0.542	0.638	0.020	0.115	0.313	0.458	78	66
Howrah	Bagnan-I	0.552	0.754	0.784	0.812	0.000	0.191	0.445	0.586	43	37
Howrah	Bagnan-II	0.586	0.785	0.757	0.789	0.035	0.166	0.459	0.580	39	39
Howrah	Shyampur-I	0.577	0.763	0.656	0.731	0.128	0.161	0.453	0.552	40	44

(Contd.)

Appendix

Table A.1 : *(Contd.)*

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Howrah	Shyampur-II	0.570	0.732	0.711	0.794	0.104	0.181	0.462	0.569	37	41
North 24 Parganas	Bagda	0.552	0.754	0.422	0.592	0.183	0.523	0.386	0.623	60	26
North 24 Parganas	Bongaon	0.595	0.790	0.501	0.687	0.156	0.488	0.417	0.655	52	13
North 24 Parganas	Gaighata	0.738	0.887	0.690	0.787	0.238	0.558	0.555	0.744	14	4
North 24 Parganas	Swarupnagar	0.385	0.705	0.506	0.650	0.169	0.425	0.353	0.594	69	34
North 24 Parganas	Habra-I	0.640	0.818	0.756	0.850	0.157	0.495	0.518	0.721	26	6
North 24 Parganas	Habra-II	0.404	0.704	0.626	0.764	0.156	0.453	0.396	0.640	56	18
North 24 Parganas	Amdanga	0.274	0.644	0.614	0.702	0.114	0.350	0.334	0.565	74	43
North 24 Parganas	Barrackpur-I	0.983	0.945	0.954	0.900	0.085	0.423	0.674	0.756	2	3
North 24 Parganas	Barrackpur-II	0.966	0.937	0.925	0.900	0.091	0.446	0.660	0.761	3	2
North 24 Parganas	Barasat-I	0.577	0.743	0.725	0.746	0.182	0.445	0.495	0.645	33	16
North 24 Parganas	Barasat-II	0.461	0.505	0.714	0.646	0.126	0.312	0.434	0.488	48	63
North 24 Parganas	Deganga	0.181	0.600	0.508	0.632	0.071	0.379	0.253	0.537	87	48
North 24 Parganas	Baduria	0.359	0.653	0.548	0.684	0.159	0.457	0.355	0.598	68	32
North 24 Parganas	Basirhat-I	0.204	0.537	0.342	0.493	0.158	0.434	0.235	0.488	89	62
North 24 Parganas	Basirhat-II	0.165	0.576	0.530	0.633	0.084	0.372	0.259	0.527	86	52

(Contd.)

Appendix

Table A.1 : *(Contd.)*

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
North 24 Parganas	Haroa	0.116	0.510	0.320	0.506	0.036	0.325	0.157	0.447	96	70
North 24 Parganas	Rajarhat	0.716	0.695	0.855	0.770	0.063	0.345	0.545	0.603	19	31
North 24 Parganas	Minakhan	0.109	0.365	0.260	0.410	0.070	0.281	0.146	0.352	100	86
North 24 Parganas	Sandeshkhali-I	0.287	0.479	0.203	0.406	0.209	0.296	0.233	0.394	90	76
North 24 Parganas	Sandeshkhali-II	0.426	0.561	0.276	0.425	0.271	0.159	0.324	0.382	75	77
North 24 Parganas	Hasnabad	0.275	0.515	0.367	0.520	0.186	0.526	0.276	0.521	83	54
North 24 Parganas	Hingalganj	0.586	0.718	0.494	0.672	0.228	0.391	0.436	0.594	46	33
Burdwan	Salanpur	0.805	0.854	0.950	0.858	0.067	0.296	0.607	0.669	5	12
Burdwan	Barabani	0.458	0.724	0.523	0.523	0.181	0.097	0.387	0.448	59	69
Burdwan	Jamuria	0.599	0.748	0.439	0.608	0.096	0.142	0.378	0.499	64	57
Burdwan	Raniganj	0.683	0.798	0.557	0.575	0.060	0.095	0.433	0.490	49	61
Burdwan	Ondal	0.871	0.861	0.681	0.716	0.023	0.191	0.525	0.589	23	36
Burdwan	Pandabeswar	0.687	0.741	0.511	0.527	0.109	0.215	0.435	0.494	47	60
Burdwan	Faridpur-Durgapur	0.564	0.738	0.586	0.609	0.140	0.199	0.430	0.515	50	55
Burdwan	Kanksa	0.567	0.766	0.650	0.625	0.378	0.259	0.531	0.550	22	45
Burdwan	Ausgram - II	0.517	0.681	0.489	0.499	0.538	0.446	0.515	0.542	28	47

(Contd.)

Appendix

Table A.1 : *(Contd.)*

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Burdwan	Ausgram - I	0.595	0.751	0.566	0.499	0.535	0.526	0.565	0.592	11	35
Burdwan	Mangolkote	0.559	0.659	0.477	0.427	0.224	0.522	0.420	0.536	51	49
Burdwan	Ketugram - I	0.385	0.538	0.453	0.438	0.125	0.321	0.321	0.432	77	73
Burdwan	Ketugram -II	0.482	0.706	0.561	0.466	0.149	0.464	0.398	0.545	55	46
Burdwan	Katwa - I	0.502	0.633	0.432	0.477	0.162	0.588	0.366	0.566	67	42
Burdwan	Katwa - II	0.532	0.635	0.390	0.426	0.222	0.519	0.381	0.527	61	53
Burdwan	Purbasthali - I	0.458	0.707	0.630	0.659	0.292	0.703	0.460	0.690	38	10
Burdwan	Purbasthali - II	0.380	0.670	0.506	0.544	0.282	0.642	0.389	0.619	58	28
Burdwan	Manteswar	0.499	0.576	0.622	0.577	0.224	0.362	0.449	0.505	42	56
Burdwan	Bhatar	0.648	0.742	0.563	0.536	0.328	0.472	0.513	0.583	30	38
Burdwan	Galsi - I	0.557	0.797	0.576	0.572	0.372	0.360	0.502	0.577	32	40
Burdwan	Galsi - II	0.618	0.762	0.574	0.545	0.467	0.647	0.553	0.651	15	15
Burdwan	Burdwan - I	0.599	0.743	0.619	0.643	0.313	0.480	0.510	0.622	31	27
Burdwan	Burdwan - II	0.652	0.786	0.602	0.627	0.531	0.473	0.595	0.628	6	24
Burdwan	Memari - I	0.601	0.753	0.622	0.588	0.420	0.478	0.548	0.607	18	29
Burdwan	Memari - II	0.600	0.746	0.588	0.667	0.438	0.497	0.542	0.637	20	20

(Contd.)

Appendix

Table A.1 : *(Contd.)*

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Burdwan	Kalna - I	0.523	0.723	0.941	0.589	0.418	0.573	0.627	0.628	4	25
Burdwan	Kalna - II	0.617	0.745	0.591	0.606	0.504	0.568	0.571	0.640	10	19
Burdwan	Jamalpur	0.604	0.769	0.539	0.568	0.503	0.711	0.549	0.683	17	11
Burdwan	Raina - I	0.711	0.772	0.821	0.777	0.232	0.375	0.588	0.641	8	17
Burdwan	Khandaghosh	0.577	0.700	0.619	0.734	0.209	0.384	0.468	0.606	36	30
Burdwan	Raina - II	0.764	0.753	0.767	0.788	0.251	0.348	0.594	0.630	7	23
Purulia	Jaipur	0.341	0.372	0.167	0.215	0.405	0.233	0.304	0.273	80	96
Purulia	Purulia-II	0.327	0.467	0.343	0.354	0.362	0.218	0.344	0.346	73	88
Purulia	Para	0.287	0.492	0.416	0.398	0.179	0.049	0.294	0.313	81	92
Purulia	Raghunathpur-II	0.257	0.516	0.340	0.323	0.199	0.020	0.266	0.286	84	94
Purulia	Raghunathpur-I	0.435	0.649	0.452	0.417	0.236	0.000	0.374	0.355	65	85
Purulia	Neturia	0.304	0.635	0.367	0.389	0.122	0.015	0.264	0.346	85	87
Purulia	Santuri	0.454	0.650	0.313	0.361	0.162	0.220	0.310	0.410	79	74
Purulia	Kashipur	0.581	0.690	0.538	0.536	0.479	0.093	0.532	0.440	21	72
Purulia	Hura	0.450	0.612	0.285	0.419	0.596	0.319	0.444	0.450	44	67
Purulia	Purulia-I	0.388	0.477	0.280	0.313	0.390	0.307	0.353	0.366	70	83

(Contd.)

Appendix

Table A.1 : *(Contd.)*

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Purulia	Puncha	0.563	0.640	0.301	0.380	0.676	0.321	0.513	0.447	29	71
Purulia	Arsha	0.347	0.445	0.109	0.122	0.680	0.396	0.379	0.321	63	90
Purulia	Jhalda-I	0.539	0.452	0.215	0.299	0.563	0.684	0.439	0.478	45	64
Purulia	Jhalda-II	0.403	0.355	0.098	0.070	0.745	0.671	0.415	0.365	53	84
Purulia	Bagmundi	0.374	0.478	0.155	0.143	0.687	0.516	0.405	0.379	54	79
Purulia	Balarampur	0.335	0.488	0.274	0.208	0.432	0.323	0.347	0.340	72	89
Purulia	Barabazar	0.457	0.546	0.187	0.272	0.930	0.315	0.525	0.377	24	80
Purulia	Manbazar-I	0.616	0.637	0.245	0.329	0.699	0.234	0.520	0.400	25	75
Purulia	Manbazar-II	0.648	0.723	0.148	0.293	0.934	0.480	0.577	0.499	9	58
Purulia	Bundwan	0.566	0.615	0.114	0.159	1.000	0.816	0.560	0.530	12	50
Malda	Harischandrapur-I	0.071	0.177	0.052	0.077	0.327	0.293	0.150	0.182	99	100
Malda	Harischandrapur-II	0.000	0.000	0.039	0.000	0.247	0.286	0.095	0.095	102	102
Malda	Chanchal-I	0.266	0.352	0.243	0.352	0.243	0.397	0.251	0.367	88	82
Malda	Chanchal-II	0.089	0.174	0.082	0.087	0.322	0.336	0.164	0.199	95	98
Malda	Ratua-I	0.153	0.168	0.085	0.098	0.126	0.204	0.121	0.156	101	101
Malda	Ratua-II	0.220	0.192	0.061	0.163	0.177	0.351	0.153	0.235	98	97

(Contd.)

Appendix

Table A.1 : *(Contd.)*

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Malda	Gazole	0.366	0.403	0.071	0.236	0.417	0.487	0.285	0.375	82	81
Malda	Bamangola	0.397	0.534	0.199	0.352	0.507	0.489	0.368	0.458	66	65
Malda	Habibpur	0.360	0.507	0.118	0.172	0.661	0.666	0.380	0.448	62	68
Malda	Maldah (Old)	0.330	0.409	0.228	0.161	0.406	0.569	0.322	0.380	76	78
Malda	English Bazar	0.185	0.352	0.166	0.223	0.189	0.385	0.180	0.320	94	91
Malda	Manikchak	0.315	0.245	0.083	0.078	0.279	0.256	0.226	0.193	91	99
Malda	Kaliachak-I	0.118	0.276	0.151	0.311	0.195	1.000	0.155	0.529	97	51
Malda	Kaliachak-II	0.117	0.240	0.088	0.123	0.394	0.560	0.199	0.308	93	93
Malda	Kaliachak-III	0.174	0.168	0.000	0.024	0.459	0.651	0.211	0.281	92	95
Average	0.476	0.620	0.466	0.508	0.283	0.392	0.408	0.507			
Variance	0.042	0.038	0.061	0.055	0.046	0.033	0.019	0.023			
CV (in %)	42.97	31.55	53.01	46.21	75.62	46.45	33.81	29.71			

Source: Authors' Calculation.

Table A.2 : Temporal Changes in MHDI, 1991-2001

District	Block	Per cent change in MHDI (Value)	Change in MHDI (Rank)
(1)	(2)	(3)	(4)
Howrah	Udaynarayanpur	29.97	8
Howrah	Amta-II	39.36	19
Howrah	Amta-I	48.26	26
Howrah	Jagatballavpur	36.35	20
Howrah	Domjur	36.57	19
Howrah	Bally - Jagachha	15.40	0
Howrah	Sankrail	29.77	9
Howrah	Panchla	61.90	36
Howrah	Uluberia-II	42.42	12
Howrah	Uluberia-I	46.19	12
Howrah	Bagnan-I	31.53	6
Howrah	Bagnan-II	26.26	0
Howrah	Shyampur-I	21.67	-4
Howrah	Shyampur-II	23.27	-4
North 24 Parganas	Bagda	61.47	34
North 24 Parganas	Bongaon	56.96	39
North 24 Parganas	Gaighata	33.96	10
North 24 Parganas	Swarupnagar	68.04	35
North 24 Parganas	Habra-I	39.23	20
North 24 Parganas	Habra-II	61.85	38
North 24 Parganas	Amdanga	69.18	31
North 24 Parganas	Barrackpur-I	12.13	-1

(Contd.)

Table A.2 : *(Contd.)*

(1)	(2)	(3)	(4)
North 24 Parganas	Barrackpur-II	15.20	1
North 24 Parganas	Barasat-I	30.35	17
North 24 Parganas	Barasat-II	12.45	-15
North 24 Parganas	Deganga	111.99	39
North 24 Parganas	Baduria	68.36	36
North 24 Parganas	Basirhat-I	108.00	27
North 24 Parganas	Basirhat-II	103.12	34
North 24 Parganas	Haroa	183.91	26
North 24 Parganas	Rajarhat	10.81	-12
North 24 Parganas	Minakhan	140.44	14
North 24 Parganas	Sandeshkhali-I	68.88	14
North 24 Parganas	Sandeshkhali-II	17.64	-2
North 24 Parganas	Hasnabad	88.53	29
North 24 Parganas	Hingalganj	36.05	13
Burdwan	Salanpur	10.25	-7
Burdwan	Barabani	15.58	-10
Burdwan	Jamuria	32.16	7
Burdwan	Raniganj	12.98	-12
Burdwan	Ondal	12.24	-13
Burdwan	Pandabeswar	13.51	-13
Burdwan	Faridpur-Durgapur	19.86	-5
Burdwan	Kanksa	3.53	-23
Burdwan	Ausgram - II	5.22	-19
Burdwan	Ausgram - I	4.72	-24

(Contd.)

Table A.2 : *(Contd.)*

(1)	(2)	(3)	(4)
Burdwan	Mangolkote	27.56	2
Burdwan	Ketugram - I	34.74	4
Burdwan	Ketugram -II	37.17	9
Burdwan	Katwa - I	54.83	25
Burdwan	Katwa - II	38.11	8
Burdwan	Purbasthali - I	49.97	28
Burdwan	Purbasthali - II	59.07	30
Burdwan	Manteswar	12.58	-14
Burdwan	Bhatar	13.76	-8
Burdwan	Galsi - I	14.96	-8
Burdwan	Galsi - II	17.77	0
Burdwan	Burdwan - I	21.87	4
Burdwan	Burdwan - II	5.59	-18
Burdwan	Memari - I	10.75	-11
Burdwan	Memari - II	17.44	0
Burdwan	Kalna - I	0.18	-21
Burdwan	Kalna - II	12.07	-9
Burdwan	Jamalpur	24.44	6
Burdwan	Raina - I	9.09	-9
Burdwan	Khandaghosh	29.44	6
Burdwan	Raina - II	6.00	-16
Purulia	Jaipur	-10.19	-16
Purulia	Purulia-II	0.65	-15
Purulia	Para	6.30	-11

(Contd.)

Table A.2 : *(Contd.)*

(1)	(2)	(3)	(4)
Purulia	Raghunathpur-II	7.82	-10
Purulia	Raghunathpur-I	-5.08	-20
Purulia	Neturia	31.05	-2
Purulia	Santuri	32.42	5
Purulia	Kashipur	-17.37	-51
Purulia	Hura	1.42	-23
Purulia	Purulia-I	3.67	-13
Purulia	Puncha	-12.92	-42
Purulia	Arsha	-15.32	-27
Purulia	Jhalda-I	8.97	-19
Purulia	Jhalda-II	-12.01	-31
Purulia	Bagmundi	-6.43	-25
Purulia	Balarampur	-2.15	-17
Purulia	Barabazar	-28.05	-56
Purulia	Manbazar-I	-23.13	-50
Purulia	Manbazar-II	-13.60	-49
Purulia	Bundwan	-5.30	-38
Malda	Harischandrapur -I	21.52	-1
Malda	Harischandrapur -II	0.00	0
Malda	Chanchal-I	46.44	6
Malda	Chanchal-II	21.11	-3
Malda	Ratua-I	29.16	0
Malda	Ratua-II	54.22	1
Malda	Gazole	31.86	1

(Contd.)

Table A.2 : *(Contd.)*

(1)	(2)	(3)	(4)
Malda	Bamangola	24.68	1
Malda	Habibpur	18.07	-6
Malda	Maldah (Old)	18.06	-2
Malda	English Bazar	77.88	3
Malda	Manikchak	-14.62	-8
Malda	Kaliachak-I	241.90	46
Malda	Kaliachak-II	54.29	0
Malda	Kaliachak-III	33.14	-3
	Average	24.06	

Source : Authors' Calculation.

Notes

1 The so-called Haque-Sen debate is based on this point (Sengupta and Ghosh 2008).

2 In fact, Sengupta and Ghosh (2008) demonstrated the non-existence of any significant relation between the provisionary facilities (in health and education) and their actual outcome.

3 Other educational variables are not available for all the blocks at least in 1991. Further, their reliability is also at a question.

4 The inequality of length is indirectly linked with the relative evaluation of intervals. However, it is still not possible to extract all the information even in partial mobility. Traces of substantial intra-class mobility may remain in trying to homogenize over a broader region. However, the cost is still substantially low compared to a fully aggregative index.

5 Burdwan is famously known as rice bowl of India.

6 Infact Kolkata may be compared with the developed area in terms of HDI.

7 Famous Asansol-Durgapur industrial zone and bowl of rice are situated in the district.

8 The high aggregate HDI of North 24 Parganas is due to the presence of an urban conglomerate around the river Hooghly situated closest to Kolkata Metropolitan Area. However, there are many underdeveloped rural blocks (such as Minakhan, Sandeshkhali-I, Sandeshkhali-II) in the district. For Burdwan the rural blocks are much more endowed and developed.

9 Only those blocks are considered for the categorisation of the ten consistent leading and laggard blocks which maintained rank from 1 to 10 and 93 to 102 respectively, over the two-time periods.

10. For details see Sengupta and Ghosh (2010).

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