

APPENDICES:

Appendix-I

Complementary Zones of Urban Centres

Name of the Urban centres		Distance (km) between 'i' & 'j' (dij)	Population of		Complementary Zones (km)	
'i'	'j'		'i' (Pi)	'j' (Pj)	Bi	Bj
Koch Bihar	Dinhata	25	92,820	23848	16.60	8.40
Koch Bihar	Tufanganj	25	92,820	16418	17.60	7.40
Koch Bihar	Mathabhanga	40	92,820	17336	28.00	12.00
Koch Bihar	Alipurduar	25	92,820	102,815	12.18	12.82
Dinhata	Tufanganj	50	23,848	16418	27.33	22.67
Dinhata	Mathabhanga	67	23,848	17336	36.17	30.83
Tufanganj	Alipurduar	33	16418	102,815	9.42	23.58
Tufanganj	Uttar Kamakhyaguri	22	16418	9092	12.6	9.4
Jalpaiguri	Dabgram	37	68,732	147,217	15	22
Jalpaiguri	Maynaguri	20	68,732	34,283	12	8
Jalpaiguri	Odlabari	60	68,732	15,536	43	17
Jalpaiguri	Mal	65	68,732	30,302	39	26
Alipurduar	Falakata	40	102,815	15,536	29	11
Alipurduar	Uttar Latabari	35	102,815	12,170	26	9
Alipurduar	Uttar Kamakhyaguri	25	102,815	9092	19	6

Source: Computed from Census data and data collected from transport offices

$$B_{ij} = D_{ij} / (1 + P_i / P_j)$$

Where, B_{ij} = Boundary between the Town i and the Town j,

D_{ij} = Distance between the Town i and the Town j,

P_i = Population of the Town i,

P_j = Population of the Town j

Appendix-II

Distance-wise categorisation of the selected Villages

DISTRICT	BLOCK	Core Town	J.L. No.	Village	Distance (km) From Core Town	Distance Zone (km)	Geographical Area (sq. km)
K O C H B I H A R	Koch Bihar II	Koch Bihar	134	Takagach	4	0-5	3.14
	Kob I		131	Ghughumari	5	0-5	11.27
	Kob II		107	Chakchaka	10	5-10	4.50
	Kob II		41	Nageswar Guri	10	5-10	1.33
	Kob I		116	Talliguri	10	5-10	3.73
	Kob II		33	Baneswar	11	10-15	2.38
	Kob II		30	Kaljani	12	10-15	14.34
	Kob I		251	Nawabganj Balasi	15	10-15	9.16
	Kob I		257	Dhumpur Balasi	17	15-20	2.10
	Kob II		3	Sajherpar Ghoramara	19	15-20	7.00
	Kob I		258	Barapak	20	15-20	1.04
	Kob I		261	Daharerpar	21	20-25	.70
	Kob I		262	Chatra Chekapdara	21	20-25	.58
	Kob II		6	Chhat Singimari	25	20-25	14.58
	Din I		Dinhata	110	Bhangni Dwitiya Khanda	1	0-5
	Din II	103		Chhota Sakdal	7	5-10	2.75
	Din I	126		Gokunda	8	5-10	.75
	Din I	29		Raja Khora	8	5-10	.82
	Din I	72		Ruier Khuthi	12	10-15	7.67
	Din I	6		Khalisa Gosanimari	15	10-15	6.66
	Din II	81		Pet Bhata Seora Guri	18	15-20	.45
	Din II	92		Salmara	22	20-25	2.39
	Din II	220		Atialdanga	24	20-25	2.02
	Tufan I	Tufanganj		92	Chamta	1	0-5
	Tufan I		89	Deocharai	8	5-10	8.44
Tufan II	65		Bhanukumari	12	10-15	8.37	
Tufan II	25		Takoamari	20	15-20	7.37	
Tufan I	1		Chhat Barochowki	21	20-25	2.18	
JALPAIGURI I	Jalpaiguri	Jalpaiguri	7	Kharia	4	0-5	58.03
	Jalpaiguri		6	Paharpur	9	5-10	24.17
	Jalpaiguri		19	Berubari Nagar	15	10-15	.34
	Jalpaiguri		26	Nandanpur	15	10-15	10.23
	Jalpaiguri		20	Sakati	20	15-20	5.68
	Rajganj		8	Gujrimari	20	15-20	7.93
	Rajganj		29	Boalmari	22	20-25	17.04
	Jalpaiguri		10	Kismat Sukhani	22	20-25	8.50
	Alipurduar I	Alipurduar	45	Birpara	1	0-5	6.12
	Alipurduar II		55	Dakshin Majher Dabri	3	0-5	2.64
	Alipurduar I		43	Chapatali	10	5-10	5.44
	Alipurduar I		35	Naottoartari	13	10-15	5.66
	Alipurduar I		27	Dakshin Sonapur	16	15-20	3.61
	Alipurduar I		19	Silbari Hat	21	20-25	6.10

Source: District Census Handbook, Village Directory, 1991 & 2001

Appendix III

Weightages assigned to the Indicators of Index of Effective Urbanisation (EUI)

Indicators	Weightages (1991)	Weightages (2001)
Urban Population (%) (X_1)	.979	.975
Urban-Rural Ratio (%) (X_2)	.975	.964
Rate of Urbanisation (%) (X_3)	.964	.937
Urban Centres per 10,00,000 Rural Population (X_4)	.981	.951
Town Density (X_5)	.924	.883

Appendix IV

Correlation Matrix between the selected indicators of Rural Development, West Bengal, 1991

Indicators	1	2	3	4	5	6	7	8	9	10	11	12
1	1.000											
2	.485*	1.000										
3	-.642**	-.455	1.000									
4	.647**	.395	-.551*	1.000								
5	.851**	.442	-.604*	.544*	1.000							
6	.881**	.579*	-.644**	.565*	.871**	1.000						
7	.579*	.726**	-.727**	.389	.632**	.723**	1.000					
8	.677**	.458	-.448	.498*	.613**	.766**	.739**	1.000				
9	-.641**	-.342	.549*	-.385	-.627**	-.439	-.608**	-.464	1.000			
10	.569*	.538*	-.435	.533*	.387	.445	.668**	.728**	-.664**	1.000		
11	.630**	.444	-.649**	.559*	.530*	.637**	.726**	.792**	-.601*	.738**	1.000	
12	.627**	.087	-.589*	.570*	.495*	.549*	.305	.500*	-.185	.381	.540*	1.000

Note * Correlation is significant at the 0.05 level (2-tailed)

** Correlation is significant at the 0.01 level (2-tailed).

1. Population Density (per sq.km), 2. Female Literacy Rate 3. Work Participation Rate (in per cent) 4. Agricultural labourer/Cultivator Ratio (per100) 5. Percentage of Workers in non-agricultural activities 6. Percentage of Male main workers in Secondary Activities 7. Percentage of Male main workers in Tertiary Activities 8. Percentage of Households occupying permanent houses, 9. Number of PHC s per one lakh persons 10. Percentage of households with Toilet, Electricity, Safe Drinking Water 11. Percentage of villages with Communication 12. Percentage of villages with Power supply

Weightages assigned to the Indicators of Index of Rural Development (RDI), 1991

Indicators	Weightages
1	0.887
2	0.635
3	-0.781
4	0.704
5	0.822
6	0.878
7	0.844
8	0.832
9	-0.699
10	0.756
11	0.844
12	0.62

**Correlation Matrix of the selected indicators relating to Rural Development,
West Bengal, 2001**

Indicators	1	2	3	4	5	6	7	8
1	1.000							
2	.468	1.000						
3	.365	.477	1.000					
4	.311	.498*	.982**	1.000				
5	.616**	.543*	.730**	.767**	1.000			
6	.631**	.765**	.755**	.744**	.676**	1.000		
7	.758**	.476	.763**	.724**	.726**	.750**	1.000	
8	.717**	.371	.265	.259	.674**	.514*	.582*	1.000

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

1. Population Density (per sq.km), 2. Female Literacy Rate, 3. Percentage of Workers in non-agricultural activities, 4. Percentage of Male main workers in Secondary and Tertiary Activities, 5. Percentage of Household with Electricity, 6. Percentage of Households with Toilet, 7. Percentage of Households occupying permanent houses
8. Percentage of factories, workshop, and work shed to occupied census houses

Weightages assigned to the Indicators of Index of Rural Development (RDI), 2001

Indicators	Weightages
1	0.738
2	0.702
3	0.843
4	0.835
5	0.875
6	0.904
7	0.897
8	0.657

1. Identification: (a) District- (b) Block (c) Village (D) J.L. No.
2. Particulars about the head of the Household: (a) Name (b) Age (c) Sex
(d) Caste (e) Religion (f) Educational Qualification
(g) Occupation (h) Income per month
 1. Primary
 2. Subsidiary
3. Family type: Nuclear/Joint
4. Particulars about other family members: (a) Total: M: F:
(b) Number of earning members (other than the head):

	Income (monthly)	Occupation
I.		
II.		
III.		
5. Place of work: (a) Distance (b) Time taken to reach
6. (a) If agriculture is the primary occupation, then,
 - i. where do you sell the surplus production ? In the nearest town / In other town / In other places.
 - ii. How much of your production you sell in the nearest town?
6. (b) If business is the primary occupation, then,
 - i. where do you sell off commodities ? In the market of - the nearest town / other town / other places / neighbouring village
 - ii. From where do you purchase the raw materials for your production? - the nearest town / other town / other places / neighbouring village.
7. (a) Are you a native or migrant to this place ?
 - (b) If migrant, i. Place of origin - ii. Reasons for migration -
 - iii. Time of migration
- (c) Do you have any plan to out-migrate from this village: Yes / No
If Yes, Place - Reasons - Time -
8. (a) How many members of your family commute daily to the nearest town for different purposes ? -
- (b) Particulars about daily and weekly commuters

Purposes	No. of daily commuters		No. of Weekly / bi weekly Commuters	
	Male	Female	Male	Female
Occupation				
Education				
Medical				
Recreation				
Administrative				
Marketing				
Others (Specify)				

9. Particulars about the persons employed to the nearest (core) town

Nature of Occupation	No. of persons	Income (Monthly)
(a) Labour- i. Seasonal ii. Full-time		
(b) Seller of commodities		
(c) Rickshaw Puller		
(d) Servant / Maid servant		
(e) Businessman		
(f) Services i. Teacher- ii. Doctor- iii. Office Staff / Clerk		
(g) Others-		

10. (a) Do you go to the nearest town for medical services? Yes / No
If Yes – i. For regular medical check-up ii. For emergency

(b) Do you go to the town hospital or consult private doctors? Yes / No

(c) Do you consult village doctors? Yes / No

11. Has there been any medical extension service during the last one year from the nearest town? Yes / No.

If Yes, What was the purpose of such visits? To provide suggestion for –

- A. Childcare B. Family Planning C. Childbearing women D. Sanitation
E. Safe drinking water F. Others.

12.(a) How many members of your family get educational facilities from the nearest town?

Levels of Education	Frequency of commuting	No. of persons
Primary		
Middle		
Secondary		
H.S		
Degree		
Technical / Non-formal		

(b). Does any one go to the town for private tuition?

13. (a) How many times do you go to avail of recreational facilities from the town?

(b) What kind of recreation do you prefer to avail of from the town?

Cinema – Functions – Drama – Book fair - Industrial fair- Games-

14. (a) What kind of administrative services do you avail of from the town?

Settlement office - B.D.O.- D.M. Office- F.C.I.- DLLRO/SDLLRO
Others.

(b) Frequency of visits-

15. Do you depend on the town post office? Yes / No

If Yes, specify the reasons - frequency of visits-

16. (a) Do you have any account in the town bank? Yes / No

If Yes, - frequency of visits-

(b) What role do the village banks play?

17. How many times you go to the towns for shopping?

(a) Frequency

(b) What type of materials do you prefer to purchase from the town?

Food articles / Clothing / Electronic goods / Household goods / Jewellery / Medicines /
Others

18. Do you attend political meeting in the town? Yes / No

If yes, reasons – frequency –

19. Do you read newspaper? Yes / No

Do you get it from the town? Yes / No

20. Do you have any relatives in the town? Yes / No

If yes, (a) frequency of visits to them –

(b) What difference do you feel between you and them?

21. Do you face any problem while availing of services from the town? Yes / No

If yes, please specify

22. Housing Infrastructures-

(a) Nature of the house: Kutcha / Pucca / Semi Pucca

(b) No. of storey (c) No. of rooms (d) Electrified / Partly Electrified

(e) Toilet: with flush / dry toilet / no toilet (f) Bathroom: Yes / No (G) Water connection: Inside /outside

23. Household items—(i) Radio/Transistor (ii) Tape recorder (iii) Television (iv) VCR/ VCP (v) Cycle (vi) Motorbike (vii) Refrigerator

24. What is your opinion about the relationship of your village with the nearest town?

Please suggest some measures which you think is important for a better relationship and associated development of your village.

APPENDIX VI

Correlation Coefficient between Percentage of Rural Workers in different Income levels in Koch Bihar and Dinhata and Distances of the villages from the towns

Variables	Distance from Koch Bihar Town	Distance from Dinhata Town
1	-.662**	-.641
2	-.036	-.720*
3	-.245	-.592
4	-.212	.490
5	-.448	.110

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

1. Rural Workers with income $\leq 1000/-$
2. Rural Workers with income 1001/--3000/-, 3. Rural Workers with income 3001/---5000/-,
4. Rural Workers with income 5001/--12,000/-, 5. Rural Workers with income $>12,000/-$

APPENDIX VII

1. Correlation Coefficients between the Proportions of Rural Commuters to nearest towns (for Social Contacts and for Political reasons) and the Distance from the nearest towns

Hinterland Villages of the Core towns of	'r' values for Distance and Proportions of households with members commuting to the core town for	
	Meeting Relatives	Attending Political Meeting
Koch Bihar	-.489	.167
Dinhata	-.292	.053
Tufanganj	-.728	.273
Jalpaiguri	-.345	.249
Alipurduar	-.583	-.127
Koch Bihar District (Combined)	-.383*	.739
Jalpaiguri District (Combined)	-.279	.207
Koch Bihar & Jalpaiguri Districts Combined	-.344*	.108

Computed

Note: * Significant at .05 level of significance

2. Correlation showing proportion of rural households involved in social and political interaction with the nearest town and transport linkage with the town (for 42 villages)

Components of transport linkage	Social Contacts	Political relation
Frequency of Buses	.237	-.287
Travel Time	-.384*	.178
Transport Fare	-.466**	.433**

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

APPENDIX VIII

Correlation Matrix of the selected indicators relating to 'Index of Urban-Rural Interaction'

Indicators	1	2	3	4	5	6	7	8	9	10
1	1.000									
2	.574**	1.000								
3	-.502**	-.892**	1.000							
4	.557**	.509*	-.469**	1.000						
5	.582**	.520**	-.538**	.574**	1.000					
6	.677**	.560**	-.443**	.520**	.602**	1.000				
7	.549**	.567**	-.554**	.434**	.614**	.401**	1.000			
8	.709**	.803**	-.677**	.469**	.581**	.717**	.587**	1.000		
9	-.452**	-.592**	.630**	-.333*	-.494**	-.455**	-.556**	-.683**	1.000	
10	.874**	.624**	-.532**	.667**	.709**	.804**	.566**	.761**	-.522**	1.000

Note ** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed)

1. Rural Working Population (%) employed at Core Town
2. Rural Households (%) availing of regular Medical Services from Core Towns
3. Rural Households (%) availing of Medical Services from Core Towns in emergencies
4. Rural Households (%) whose members depend on Regular Educational Services from Core Towns
5. Rural Households (%) whose members depend on Regular & Private Educational Services from Core Towns
6. Rural Households (%) whose members depend on Shopping of 'All Items' from Core Towns
7. Rural Households (%) depending on Banking services at Core Towns
8. Rural Households (%) availing of Recreational facilities at Core Towns frequently
9. Rural Households (%) availing of Recreational facilities at Core Towns occasionally
10. Average values of Commuting Frequencies

Weightages assigned to the indicators relating to 'Index of Urban-Rural Interaction'

Indicators	Weightages
1	.822
2	0.84
3	0.785
4	0.69
5	0.78
6	0.784
7	0.728
8	0.887
9	-0.716
10	0.895

APPENDIX IX

Qualitative categorisation of villages according to the Levels of Interaction with Core Town

Ranges	Levels	Villages	Core Towns
>=10	Very high	Kharia, Takagach	Jalpaiguri, KochBihar
5---10	High	Dakshin Majher Dabri, Chapatali, Chamta, Paharpur, Chakchaka, Birpara	Alipurduar, Tufanganj, Jalpaiguri, Koch Bihar, Alipurduar,
0---5	Moderate	Ghughumari, Chhota Sakdal Talliguri, Berubari Nagar, Bhangni DwitiyoKhando, Baneswar, Deocharai	Koch Bihar, Dinhata, Koch Bihar, Jalpaiguri, Dinhata, Koch Bihar, Tufanganj,
[0---(-5)]	Low	Gokunda, Kaljani, Gujrimari, Nandanpur, Bhanukumari, Ruier Khuthi, Khalisa Gosanimari, Salmara, Takoamari, Kismat Sukhani, Boalmari, Nageswarguri, RajaKhora, Nawabganj Balasi, Chhat Barochowki, Dakshin Sonapur, Sajherpar Ghoramara, Chhat Singimari, SilbariHat, Sakati, Naottoartari, Pet Bhata Seora Guri, Atialdanga	Dinhata, Koch Bihar, Jalpaiguri, Tufanganj
(-5)---(-10)	Very low	Chatra Chekadara, Barapak, Dhumpur Balasi, Daharerpar	Koch Bihar

Computed

APPENDIX: X

Correlations

	X ₁	X ₂	X ₃	X ₄	Y
X ₁	1.000				
X ₂	-.509**	1.000			
X ₃	.781**	-.617**	1.000		
X ₄	.745**	-.576**	.741**	1.000	
Y	-.764**	.501**	-.795**	-.720**	1.000

** Significant at .01 level

Distance (X₁), Frequency of buses (X₂), Travel time (X₃) and Transport fare (X₄)

APPENDIX: XI

Correlations

	Distance from Jalpaiguri Town	Total literacy Rate	Male literacy Rate	Female literacy Rate
Distance from Jalpaiguri Town	1.000			
Total literacy Rate	-.741**	1.000		
Male literacy Rate	-.731**	.991**	1.000	
Female literacy Rate	-.695**	.850**	.817**	1.000

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

APPENDIX: XII

Correlation Matrix of the selected indicators relating to 'Index of Development' (Village level)

Indicators	1	2	3	4	5	6	7	8	9	10	11	12	13
1	1.000												
2	.561**	1.000											
3	.475**	.375*	1.000										
4	.349*	.415**	.568**	1.000									
5	.344*	.140	.438**	.617**	1.000								
6	.509**	.470**	.610**	.775**	.438**	1.000							
7	.258	.399**	.462**	.735**	.472**	.797**	1.000						
8	.176	.378*	.294	.465**	.284	.470**	.578**	1.000					
9	.352*	.578**	.558**	.633**	.398**	.683**	.737**	.572**	1.000				
10	.323*	.478**	.537**	.626**	.516**	.708**	.568**	.424**	.590**	1.000			
11	.349*	.263	.589**	.486**	.355*	.592**	.490**	.270	.542**	.497**	1.000		
12	.341*	.575**	.542**	.634**	.480**	.690**	.684**	.642**	.884**	.694**	.521**	1.000	
13	.501**	.174	.515**	.493**	.400**	.684**	.483**	.142	.397**	.463**	.672**	.430**	1.000

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

- 1) Percentage of Rural Households with family income of Rs.12,000/month
- 2) Percentage of Rural Households with per capita income of Rs.1001-2500/month
- 3) Percentage of heads of the Rural Households with H.S education level
- 4) Percentage of Rural Households with more than 75% of Non-Farming Workers
- 5) Percentage of Rural Households reading Newspapers
- 6) Percentage of Rural Households with Pucca Houses
- 7) Percentage of Rural Houses with electricity
- 8) Percentage of Rural Houses with toilet
- 9) Percentage of Rural Houses with Bathroom
- 10) Percentage of Rural Households with Tape recorder
- 11) Percentage of Rural Households with Refrigerator
- 12) Percentage of Rural Households with Television
- 13) Percentage of Rural Households with Motorbike

**Weightages assigned to the indicators relating to 'Index of Development'
(Village level)**

Indicators	Weightages
1	0.554
2	0.599
3	0.729
4	0.829
5	0.611
6	0.895
7	0.82
8	0.598
9	0.844
10	0.787
11	0.696
12	0.862
13	0.664

APPENDIX: XIII

**Qualitative categorisation of villages according to the
Levels of Development**

Ranges	Levels	Villages	Core Towns
>=30	Very high	Kharia	Jalpaiguri
15—29.99	High	Baneswar, Paharpur, Chakchaka, Birpara, Takagach, Gokunda BhangniDitiyoKhando	KochBihar, Jalpaiguri, Alipurduar, Dinhata
10—14.99	Moderately high	Ghughumari, Talliguri, Dakshin Sonapur, Chamta, Silbari Hat	KochBihar, Alipurduar, Tufanganj,
0—9.99	Moderate	Berubari Nagar, Bhanukumari Gujrimari, Khalisa Gosanimari, Dakshin Majher Dabri, Chatra Chekapdara, Deocharai	Jalpaiguri, Tufanganj, Dinhata, Alipurduar, KochBihar,
0---(-9.99)	Low	Kismat Sukhani, Nawabganj Balasi, Shakati, Salmara, Kaljani Chhota Sakdal, Dhumpur Balasi, Takoamari, Ruier Khuthi Chhat Barochowki	Jalpaiguri, KochBihar, Dinhata, Tufanganj
<=(-10)	Very low	Raja Khora, Chhat Singimari, Sajherpar, Boalmari, Chapatali, Naottoartari, Nandanpur, Barapak, Atialdanga, Pet Bhata Seora Guri Nageswarguri, Daharerpar	Dinhata, KochBihar, Jalpaiguri, Alipurduar, Dinhata

Computed