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PROBLEMS AND PLANNING FOR AN EFFICIENT RURAL LINKAGE SYSTEM WITH REFERENCE TO PUNCHA BLOCK OF PURULIA DISTRICT, WEST BENGAL.

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Abstract:

Movement of man and material across spaces is accomplished through some definite channels of transport network. These channels consist of nodes and routes connecting these nodes. On the efficiency and fluency of linkages between the places the advancement of a region depends upon. The present paper is an humble submission to explore the existing linkage system, evaluate areal accessibility, measure nodal accessibility with reference to Pancha Block of Purulia District, one of the backward Districts of West Bengal. The Study found Pancha and Kenda as high accessible zones. Most of the pockets of the Block represents a very disappointing figure in respect of accessibility measures. The areal network found to be branching. The existing tree sort of network should be enhanced into a circuitary network implying maximum connections. This can be achieved by increasing number of lower order tributary linkages to the existing linkage system.

KEY WORDS:

Linkages, Accessibility, Disappointing, circuitary network.

INTRODUCTION:

PROBLEM AND SIGNIFICANCE:--

Any small settlement at first emerges as 'self sufficient subsistence unit'(Thompson,1967) but when it aims to march towards its economic maturity it needs primarily a) increase in the range of its functional magnitude, b) extension of external servicing capacity, c) enhancement in its locational interdependence. These ends may be achieved only if the settlement has adequate and sufficient inter/intra regional linkages. More to add that the settlement may have abundant natural resources; they cannot go forward if they continue to be remote and inaccessible. (Fielding, 1974).

The movement on over an idealized space is primarily governed by two forces, viz, --a) the push-pull forces of supply and demand(the generators of the movement), b) frictional effect of distance.(the restraint on movement). Both these forces act reciprocally—the push-pull forces of supply and demand highly depend upon the cost of overcoming distance, i.e., on the efficiency and fluency of linkage between the places. Thus planning for a efficient linkage system is a primordial step to lubricate the rusty process of development of an area. (Singh, 1964, p.99).

OBJECTIVES: –

The paper opts to diagnose the followings, viz,

- a) To examine the existing linkage system through the evaluation of areal accessibility—by metalled and unmetalled roads;
- b) To scrutinize the nodal accessibility.
- c) To plan an efficient rural linkage system in a backward rural economy.

To accomplish these objectives, the paper has been divided into three parts, Section I depicts the existing linkage system. Section II is an attempt to explore nodal accessibility zones while section III opts to plan an efficient rural linkage system .

AREA UNDER STUDY:--

The rain fed Purulia district (from 22o42'35"N to 23o42'00"N latitudes and from 85o49'25"E to 86o54'37"E longitudes) is a part of the Chhotonagpur plateau in India consisting of “succession of rolling uplands with intervening hollows” and infertile lateritic soil. The physical landscape, quite unique having distinctive topography, soil, terrain, drainage, forest can be characterized as poorly suited to agriculture and a high incidence of severe poverty. Like the topography of the district, its population structure (Area: 6259km²; Population: 2536516 as per 2001 Census of India) is unique having highest concentration of Scheduled Tribe population (18.27% %) in West Bengal. The bulk of its population consists of Hinduized and Semi-Hinduized communities who still preserve some of the life style of their tribal forefathers. Economically also, the district is one of the poorest among the sixteen districts of West Bengal.

Puncha Block (Lat. 23o10'N – 23o16'N and Long. 86o40'E – 86o55'E) lies in the eastern part of Puruliya District. It is under P.S. Puncha and Kenda. The block stretches over an area of 330.1 sq. km and has a population of 108129 persons inhabited in 98 villages out of 109 villages. Single cropped agriculture is the mainstay of economy here. 53% of total area is cultivable and 18.43% cultivable area is irrigated. Regarding educational facilities, middle, secondary, and H.S. school are found to occur in 22, 17 and 4 villages respectively. The area under scrutiny witnesses inadequacy in every means of transport linkages. Seventy one villages are out of preview of bus service till today.

Table I : Position of Puncha Block.

RANKING	DISTRICT	STATE	NATIONAL
AREA	8	64	2460
POPULATION	13	287	3207
SEX RATIO	3	220	2073
CHILD SEX RATIO	8	96	1460
LITERARACY RATE	3	249	3265
POP. DENSITY	12	50	3294
WORK PARTICIPATION RATE	17	322	2893

Source: -- Census of India, 2011.

LOCATION MAP OF THE STUDY AREA

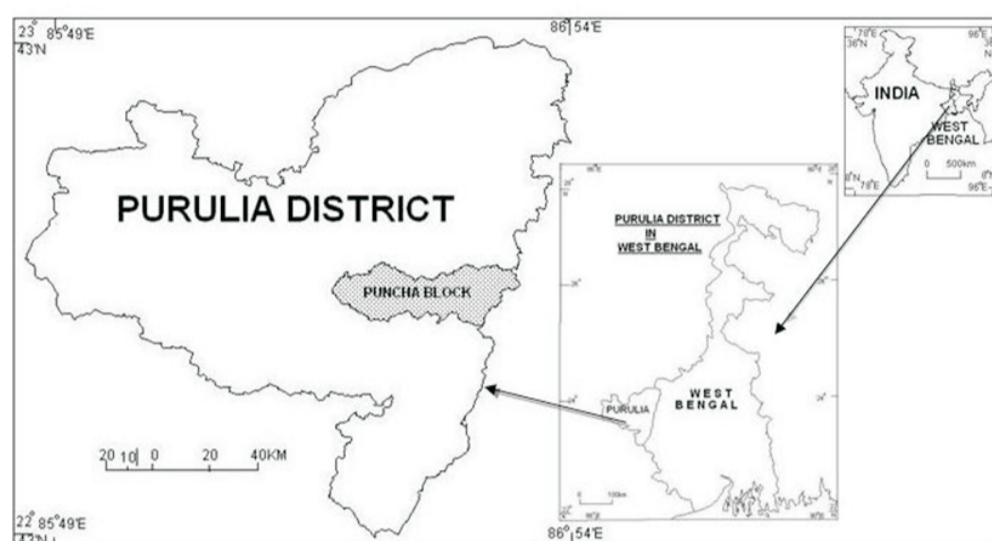


Fig I:--location map.

RESULTS AND DISCUSSION:--

Section I: Evaluation of existing linkage system:--

a)The road network in existence:--

With a view to facilitate the movement of men and material from one discrete node to another across space some definite channels of transport are required. These channels consist of nodes and routes connecting these nodes. The term network may, thus, be considered as referring to spatial pattern of transportation facilities in a given region.

The block suffers from all sorts of linkage system. It is 43 kms away from the nearest railway station. So no question of railway service arises in the block under scrutiny. The only way of communication is through road transport that also found to be disappointing. The western part of Kasai river comprising the Kenda Circle, all weather motorable road concentration is insignificant. One state highway traverse from Manbazar to Purulia touches kenda and Panipathar Gram Panchayet. This is the only metalled road passing through panipathar gp. In Kenda Gp, apart from the state highway, there are two metalled road connections, one that runs from Konapara through Balakdi meets the state Highway near Kenda 'Thanagora', another road radiates from kenda to Noagarh. From Kenda another road runs towards koira to link jambad and Puncha, the block headquarters of the Puncha Block. The metalled road density is found to be very worrisome is so far the Pirrah GP is concerned. Only one motorable road passes through the gp bordering Kenda and Puncha in its two sides. The road is also frequented by hallows, broken here and there, also resembles an unmetalled road. Three metalled roads are found to be radiating in the direction of Noagarh, Keshra and Kadma, but both the length and condition are very frustrating. In the western half within the Kenda P.S. the density and state of all season motorable roads are disappointing. Most of the villages are connected through unmetalled roads and cart tracks. That makes most part of the villages remote and inaccessible.

The picture is a little bit better in the eastern front of Kasai. Gpwise all weather motorable road density varies from 0.15 km/ sq. km in the Chandra Gram Panchayet to 0.60 km/sq. km in the Puncha Gram panchayet. One important metalled road from manbazar to Purulia Via Lalpur runs through Napara. The other metalled road in the gp include Napara to Shyamakata, Napara to Koira, Bhutam to Gagda, kanandi, Koira, Koira-suridih to Kenda, Napara and Puncha. The metalled road density in bagda Gp is to the tune of 0.38 Km/Sq.Km. The road that flows from Manbazar to Puruluia also traverse through Bagda. Apart from this, Ramkundi to Sargara, Napara, Gopalpur, Baragram and Gopalpur to Chirudih, Baragram are other metalled road in this gram panchayet.

In so far as the Chirudih Gp is concerned, two nodes, namely, Tusooria and Laharia are

diagnosed. In tusugoria, the road from chirudih to bankura are seen to converge with all season Bankura-manbazar road. From laharia, three metalled road in the direction of gopalpur,poradi and Arali-Chirudih are noticed. Lakhra Gp suffers from paucity of metalled road. Barring the Bankura-Manbazar road that passes through Badra of the Lakhra Gp, no significant metalled road are there. Another road from Dhadki to Lakhra also exists in this gp. In Puncha GP, three major nodes are distinguished. One is Block Headquarters from where three metalled roads in the direction of Manbazar, Purulia and Koira are found to be radiating whereas roads from Manbazar to Purulia, from Manbazar to Bankura, from lakhra to Dhadki traverse through the Dhadki node of the Puncha Gram Panchayet.

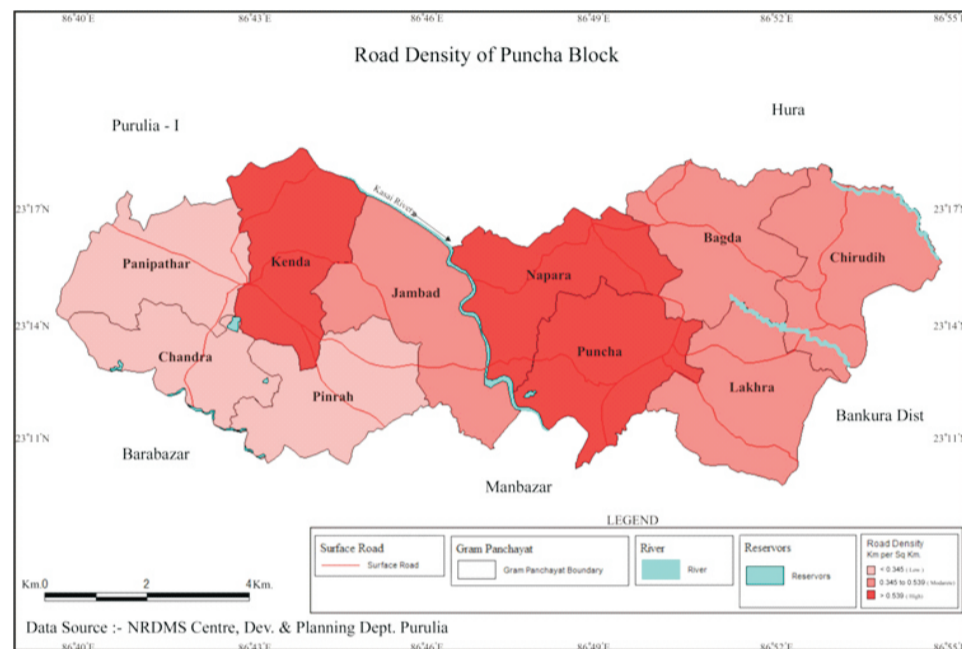


Fig 2:--Road Density map of Pancha Block.

b) Areal accessibility:--

Governed basically by the terrain and state of transport web of an area, areal accessibility implies physical access to any transport facility and clarifies the ease and comfort one feels from one place to another. It is a relative term showing a complementarity (Shukla, 1981) between the place of origin and destination. Pancha suffers from tremendous paucity of transport web. Scarcity of metalled road makes most part of the undulating terrain inaccessible. Scarcity of metallic road coupled with poor socio-economic status designate this block as 'Backward'.

On both side of an all weather motor able road up to 1.5 km, in a plateau fringe undulating topography, the area has been considered to be easily accessible, from 1.5—2.5 km accessible and beyond 2.5 km hardly accessible. The area under scrutiny witnesses inadequacy in every means of transport linkages. It has been found from the survey that 52 villages can access metallic road within 1.5 km, comprising mostly the south eastern part of kenda circle and north eastern side of the Pancha circle. Within 1.5—2.5 km distances from the motorable road 44 villages are there. There are 13 villages that has to cross > 2.5 km to access the metalled road. The maximum value being more than 8 km.

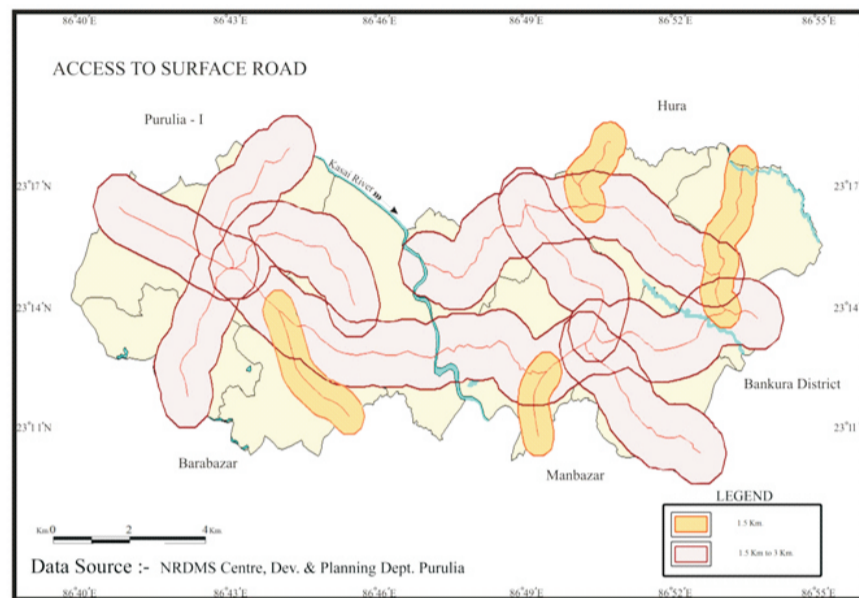
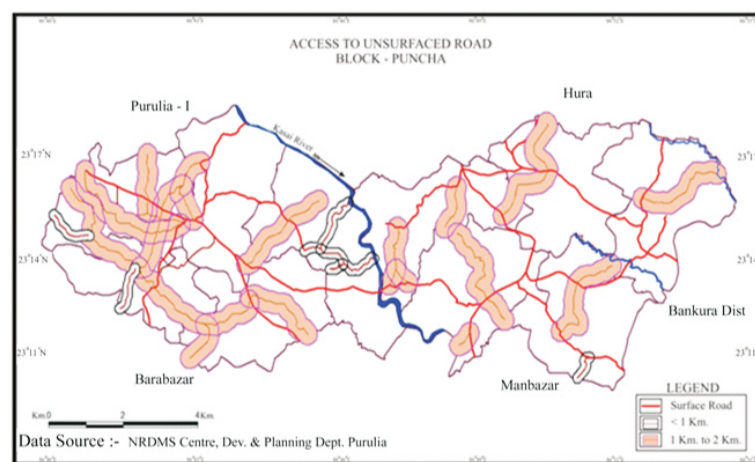


Fig.3—Access to metalled road of Puncha block.

The unmetalled and cart track are insufficiently scattered all over the block. Very few villages can access unmetalled road within 1 km from their villages. Most of the village roads are footpaths and cart tracks. The villages in the extreme western margin consisting of Panipathar Gp, south western part and southern part of Chandra and Pirrah gp, in the Kenda circle the villagers can have a touch of unmetalled road after travelled through one to two kms from their villages. Similar observations are also having in all parts of the Puncha circle. In a mountaneous and plateau track, if we can consider location of villages beyond 1 km from metalled road to be inaccessible. Against this consideration most villages in the Block are found to be poor accessible.



Section II: Accessibility Measures:--

Methodology:--

To measure the nodal accessibility, the metalled and main unmetalled roads have been abstracted as a graph, On which ten nodes, i.e., Vertices have been identified. It's very difficult to find out nodes in such a region where extreme dearth of metalled road compels most of its parts inaccessible. However, each nodes have been selected on the basis of the following considerations, viz.,

- A) Each node is a junction (Hagget, 1979) on the intersection on any two routes.
- B) Nodes are permanent cluster of discrete (Cox, 1972,p.190) agglomeration of socio-economic and physical activities.
- C) It is a place where producers and/or suppliers along with consumers interact or transact.

After that shortest path matrix procedure has been adapted and 10*10 matrices for i) Topological Distance ii) Connective Matrix iii) Direct paths have been compared and analyzed.

Distance matrix represents the total topological distance (km) one has to travel from one particular node to other remaining nodes(Appendic I). Connective matrix speaks of the total number of steps taken in travelling from one node to all other nodes (Appendic II) while direct path matrix gives an account of the direct connections of a node to other nodes(Appendic III). Summation of these matrices gives rise to a vector of net index of nodal accessibility for each node.(table 1). To boot, special weightage have been assigned to node having transport facilities. Bus station scored as 3, regular bus stop—2, request bus stop—1. These have been ranked relatively. To explain centrality of location of nodes 'weightage for linkage radiation' have been awarded. Linkage radiation is termed as the number of routes or linkages radiating from a node to different directions. Weightage have been given just inverse to the number of radiating linkages, i.e., 4 directional linkage is weighted as 1, 3 as 2, 2 as 3, 1 as 4. Integrated nodal accessibility has been obtained by multiplying composite index of nodes with rank of weightage for linkage radiation for node.

Table: --1. Nodal Accessibility.

Nodes	Connective Steps	R	Direct Path	R	Topological Distance	R	Transport Facilities	R	Composite index	Weight age for Linkage Radiation	Weight	Integrated Index	R
Puncha	17	2	7	1	111	3	3	1	1.75	4	1	1.75	I
Badra	23	6	2	5	127	5	2	2	4.50	3	2	9.00	VI
Poradi	31	8	2	5	156	9	2	2	6.00	3	2	12.00	VIII
Bagda	23	6	2	5	111	3	2	2	4.00	3	2	8.00	V
Napara	21	5	5	3	108	2	2	2	3.00	4	1	3.00	III
Jambad	15	1	5	3	103	1	2	2	1.75	2	3	5.25	IV
Kenda	18	3	6	2	121	4	2	2	2.75	4	1	2.75	II
Punura	26	7	3	4	140	8	2	2	5.25	2	3	15.75	IX
Noagarh	26	7	2	5	139	7	2	2	5.25	3	2	10.50	VII
Kuruktopa	20	4	3	4	128	6	2	2	4.00	2	3	12.00	VIII

Source:--Field Survey and computation by author, 2013.

From the connective matrix it is easier to diagnose how many steps one has to undergo while moving from one node to another. Jambad of the kenda circle tops the list immediately followed by puncha and Kenda nodes. Punura, Noagarh, bagda, Badra—all these nodes are lagging behind in these aspects while Poradi ranks the lowest. As regards the direct connections between nodes, Puncha possesses the maximum facilities followed by Kenda. Badra, Poradi, Bagda, Noagarh occupy the lower portion of the rank table. Napara, jambad, and Kuruktopa enjoy the moderate nature of direct connections between

PROBLEMS AND PLANNING FOR AN EFFICIENT RURAL LINKAGE SYSTEM WITH REFERENCE.....

nodes. The linear distance between one node to another significantly varies on both sides of Kasai. From poradi it is very much tough to communicate all other nodes owing to too much topological distance, followed by Noagarh, punura, Kuruktopa and Badra. Relatively it is better in case of jambad, Puncha, napara and Kenda. It is matter of great concern that no significant Bus station has been found barring Puncha from where a few buses starts their journey. But their number is very trivial. All other nodes serve either as regular bus stop or request bus stop. Roads in various directions from a single node have been found to be performing not satisfactorily except puncha, kenda and Napara. I

From the above analysis all the 10 nodes have been grouped into five tier hierarchial order. Puncha fall under the most accessible category; Kenda and Napara under high accessible; Jambad under moderate accessible category, Bagda, Badra, Noagarh under low accessible and Kuruktopa, Poradi and Punurah under very low accessible areas. Higher accessibility of Puncha may be attributed to its redial linkages and higher functional accumulations whereas hard access to kuruktopa, poradi, punurah, noagarh may be said to be the outcome of their peripheral locations and sparse lower order linkages.

Section III: Planning Proposals:--

The existing tree sort of network should be enhanced into a circuitary network implying maximum connections. This can be achieved by increasing number of lower order tributary linkages to the existing linkage system. In this connection following proposals have been made:--

a)Construction of metalled road: -- The block exhibit poor linkage between the eastern and western side of Kasai River. Western part suffers more from paucity of all weather motor able road. The following areas need to be upgraded to all weather motorable road status in an urgent basis, such as;

From Badra village to its southern gp Lakhrah, From bagda to gopalpur, From jambad to koira village, In the northern and sadan part of Punurah more of Panipathar gp, From ramkundi to gopalpur, baragram, simakata, From lakhra to Brammamayinagar, Mishra deoli, Puncha to Kendadih(3 km), Saragora (2km), Pakbirrah(3km), Baromesa (2 km) etc., Panrui to Badbahal (2.5 km). Dhadki to damodarpur via Radhanagar. (2 km). Bagda to Gopalpur(5km), work has started off late. Damodarpur to Rama Kundih(3 km). Bhutam to tatari (2.5Km), Nirvaypur to Koira(2 km), Jambad to Chandadih(5 km), Bamundih to Konapara(5 km), Kenda to hariharpur (2 km), Pirrah to Kuruktopa(1.5km), Raghudih to matha(1.5km), Lakhra to Badra (2km), Punurah to Chandra(6km), Dorodih to Rajakhanda (5 km), Noagarh to Kuroktopa(5 km), Kenda to Saurang(4 km), Badra to Raghunathpur (3km), Deoli to Birdang(2.5km), Poradi to Arkuldanga(6km).

b)Upgradation of metalled roads: -- The following roads need to be repaired as they are in a very dilapidated condition, as follows; viz. From noagarh to Kenda; From jambad to pirrah; From dhadki to lakhra, From shyamakata to napara, From bhutam to koira.

It is matter of positiveness that in December 2013, in an effort to link the village main roads to the main metalled road, the following roads in Gps are in construction in an urgent basis from the B.D.O. office of the Block, as Follows,

Name of gram panchayet	Water bound Macadam Road to be constructed.
Puncha	a) PWD Palash bagan to purandi Bat tree b) Punchas metalled road to bahadurpur via Kendadih. c) Dala Kalimandir to kasai nadi ghat.
Lakhra	a) Lakhra raidi more to Purandi via Bhorabsthan, Pakbirra. b) Badra more mettalled ropad to Runjkhuku kalapathar metalleed road.
Bagda	a) Bhelagora Shibmandir to Lalpahari road. b) Bagda Battal to Chadrapur via Kanara Joynagar road.
Chirudih	a) Chandanpur to khayerbani via gholkund.
Napara	a) Ramaidi Metalled road to maheshpur Nadighat via sardardi.
Jambad	a) Bansa Metalled road to kuldi. b) Jambad to Kenda Sardardi more via rangagora.

PROBLEMS AND PLANNING FOR AN EFFICIENT RURAL LINKAGE SYSTEM WITH REFERENCE.....

Pirrah	a) Raghudi metalled road to Khorbona via Joypur. b) Kuruktopa more to Babujhor.
Chandra	a) Rajnoagarh more to narasinghdih
Panipathar	a) Lepodih to Maa Kalyaneswari. b) Taltal metalled road to Pechara. c) Pratappur to Punura metalled Road.
Kenda	a) Kenda metalled road to Ranidih via Bharatdi b) Kenda sardardih school more Saurang mudidih.

c) Construction of unmetalled road:-

From puncha to Saragora (2 km), Panrui to Bandhbahal (3 km), Laulara to Bandhbahal via Mudidih (3km), Puncha to Pakbirrah(3 km, already under construction), Dhadki to Damodarpur via radhanagar (2 km), Damodarpur to Ramkundi(3 km), Bhutam to tatari(2.5 km),

Nirbhaypur to Kaira(2 km), Jambad to Bamundih(5km), Bamundih to Konapara (5 km), Kenda to Hariharpur(2 km), pirrah to kutuktopa(1.5km), Raghudih to matha (1.5km), Lakhra to Bodra(2 km), Punurah to Chandra(6 km),Dorodih to Rajakhundu(5km), Noagarh to Kuruktopa(5 km), Kenda to Saurang (4 km), Badra to Raghunathpur (3 km), Deoli to Birdang(2.5km), Poradi to Arkuldanga (6 km).

d)Construction of bridges:--

A bridge is of utmost necessity between the sabar dominated Gagda village with the jambad gp. This bridge reduces the distance between jambad and napara, one underdeveloped and relatively, one developed villages. Not only will that it make easy accessibility between jambad and Purulia Sadar.

Construction of Bus Station: -- a bus station should be built upon in Puncha from where several buses should ply and link various pockets of the block. Only one bus is there that directly go through the two sides of Kasai. It's a irony of fate that due to extreme dearth of network system and means of transport between the two parts of Kasai, it seems that kasal have given birth to two separate blocks .The inhabitants of the eastern part of kasai look upon its counterpart on the western half as 'Naripar' inhabitants, deeming them backward in every aspect as they are far away from the Block Headquarters, Puncha. And very least connectivity is responsible for the physical and mental separation. It's a mandatory that block headquarter should be easily accessible from all parts of the Block, hardly found in case of puncha block.

In addition to the above specific proposals in general, all the market centres should be interlinked with one another and with their surrounding rurality and deviousness of lower order tributary linkages should possibly be removed to enhanced the level of interaction.

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Appendic I. Topological Distance Matrix.

Nodes	1	2	3	4	5	6	7	8	9	10	Total	Rank
1.Puncha	0	3	7	2	6	12	19	22	22	18	111	3
2.Badra	3	0	4	4	9	15	22	25	24	21	127	5
3.Poradi	7	4	0	7	11	19	26	29	28	25	156	9
4.Bagda	2	4	7	0	5	12	19	21	22	19	111	3
5.Napara	6	9	11	5	0	8	15	18	19	17	108	2
6.Jambad	12	15	19	12	8	0	7	10	11	9	103	1
7.Kenda	19	22	26	19	15	7	0	3	4	6	121	4
8.Punurah	22	25	29	21	18	10	3	0	4	8	140	8
9.Noagarh	22	24	28	22	19	11	4	4	0	5	139	7
10.Kuruktop a	18	21	25	19	17	9	6	8	5	0	128	6
Total	111	127	156	111	108	127	140	139	128	125		

Data Source:--Field survey and computation by author, 2012.

Appendic II: Connective Matrix.

Nodes	1	2	3	4	5	6	7	8	9	10	Total	Rank
Puncha	0	1	2	1	2	1	2	3	3	2	17	2
Badra	1	0	1	2	3	2	3	4	4	3	23	6
Poradi	2	1	0	3	4	3	4	5	5	4	31	6
Bagda	1	2	3	0	1	2	3	4	4	3	23	6
Napara	2	3	4	1	0	1	2	3	3	2	21	5
Jambad	1	2	3	2	1	0	1	2	2	1	15	1
Kenda	2	3	4	3	2	1	0	1	1	1	18	3
Punura	3	4	5	4	3	2	1	0	2	2	26	7
Noagarh	3	4	5	4	3	2	1	2	0	2	26	7
Kuruktopa	2	3	4	3	2	1	1	2	2	0	20	4
Total	17	23	31	23	21	15	18	26	26	20	232	

Data Source:--Field survey and computation by author, 2012.

Appendic III: Direct Path Matrix.

Nodes	1	2	3	4	5	6	7	8	9	10	Total	Rank
Puncha	0	1	1	1	1	1	1	1	0	0	7	1
Badra	1	0	1	0	0	0	0	0	0	0	2	5
Poradi	1	1	0	0	0	0	0	0	0	0	2	5
Bagda	1	0	0	0	1	0	0	0	0	0	2	5
Napara	1	0	0	1	0	1	1	1	0	0	5	3
Jambad	1	0	0	0	1	0	1	1	0	1	5	3
Kenda	1	0	0	0	1	1	0	1	1	1	6	2
Punurah	1	0	0	0	1	1	1	0	0	0	3	4
Noagarh	0	0	0	0	0	0	1	0	0	1	2	5
Kuruktopa	0	0	0	0	0	1	1	0	1	0	3	4
Total	7	2	2	2	5	5	6	3	2	3	37	

Data Source:--Field survey and computation by author, 2012.

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