



## THE SPATIAL PATTERN OF TRANSPORT ACCESSIBILITY IN RURAL JHARKHAND

**Gloria Kuzur**

Researcher, Institute for Studies in Industrial Development  
Vasant Kunj, New Delhi

### ABSTRACT

*Transport accessibility problems in rural areas severely retards development prospects in developing countries. In India, the state of Jharkhand is severely disadvantaged in terms of rural transport accessibility. The objective of this paper is to study the spatial pattern of transport accessibility and identify the areas which have advantages and the areas which are deficient in terms of transport accessibility in rural Jharkhand. In the present context, transport accessibility is studied in terms of transport provisions (approach to villages with all-weather road, bus and railway services) and personal mobility (ownership of motorized i.e., motorcycles, car/jeep transport vehicles) for the 24 districts in Jharkhand. Firstly, the study shows that apart from the poor performance in terms of transport accessibility with all-weather roads in comparison to the all-India picture, there are vast regional disparities within the state. Vast regions of under provision of this facility are notable across the state except for few concentrated regions mostly along the mining and industrial centres in the state. Secondly, the study has revealed that the personal mobility in terms of ownership of motorized vehicles (motorcycles, car or jeep) is poor with high inter-regional variations. The ownership of non-motorised (bicycles) means of transport predominates in the rural areas of Jharkhand. The findings of the study suggests for a more inclusive policy for strengthening rural accessibility in order to bring about balanced regional development in Jharkhand.*

### Introduction

Transport is regarded as the basic facilitator of development in any area as it not only provides physical connectivity between two spatially separated locations but also allows spatial interactions of goods and people between them. The basic impulse of the countries investing in transport infrastructure programme has been to induce development in the region directly or indirectly by stimulating economic growth in the short run and consequently overall socio-economic development in the long run. In the Less Developing Countries the focus is on the role of transport for promoting rapid economic development (Hoyle, 1973). In recent decades there has been a growing realization about the potential role of transport development in achieving the UN's Millenium Development Goals (MDGs), which range from halving global poverty and hunger, to protecting the environment, improving health and sanitation and tackling discrimination against women (AITD, 2005). The main purpose of transport is to provide accessibility which is defined as the ability to make a journey for a specific purpose (Nutley, 1998, p.187). The distribution of transport infrastructure creates opportunities for spatial interactions that can be measured as accessibility.

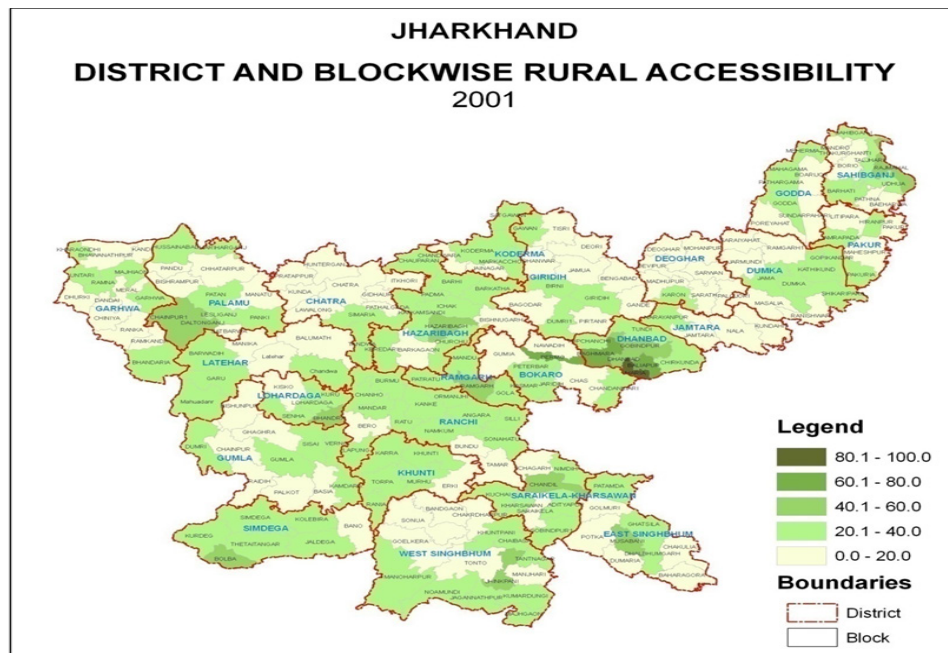
Transport accessibility problems in rural areas severely retards development prospects in developing countries. In India, the state of Jharkhand is severely disadvantaged in terms of rural transport accessibility. According to the World Bank, the under provision of all-weather roads has been considered to be one of the bottlenecks to growth in Jharkhand (World Bank, 2007). The objective of this paper is to study the spatial pattern of transport accessibility and identify the areas which have advantages and the areas which

are deficient in terms of road transportation in the rural areas of the state. The present analysis of rural transport accessibility implies the opportunities that are available to make a journey. Transport accessibility is studied in terms of transport provisions (all-weather road approach) and the personal mobility (motorized vehicle ownership) in the rural areas (district level) in Jharkhand.

### Measures of Transportation Accessibility in Rural Areas

The rural study is based on the 24 districts of the state for 2001. The analysis is further updated with the latest available 2011 census data. In the rural context, the census criteria for accessibility i.e., provision of all-weather roads to all inhabited villages, have been used to level of transport provisions in entire state. The per centages of villages with approach to all-weather roads to total inhabited villages are ranked and cartographic techniques are used for mapping and analysis. The attributes of bus and railway facilities to total inhabited villages are also analyzed. The ownership of motorized vehicles both two-wheelers (motorcycles, moped) and four-wheelers and non-motorized vehicles available at the household level are used to study the personal mobility in the state. The analysis is based on the secondary sources of data: 1. Census of India, 1991, District Census Handbook, Block Maps, 2. Census of India, 2001, Village Directory, Jharkhand, 3. Census of India, Household Table, 2001 and 2011.

**Map 1 : Jharkhand Distret And Blockwise Rural Accessibility 2001**



Source: Census of India, 2001, Village Directory.

### Spatial pattern of Transport Provisions in Jharkhand

The approach to all-weather road is an important development indicator for the villages.

The opportunities of spatial interaction are limited in the rural areas of Jharkhand with inadequate transport provisions and poor personal mobility. The inadequacy of road transport has been a deterrent to growth and according to a World Bank report (2007), the under provision of all-weather roads has been one of the bottlenecks to growth in Jharkhand.

At the district level, the physical accessibility of villages with all-weather roads is very poor. In Jharkhand, 21.2 per cent of the inhabited villages have access to all-weather roads (Table 1). Out of the 24 districts of Jharkhand, Dhanbad is the only district which has the maximum rural connectivity (43 per cent) with all-weather road for inhabited villages followed by the districts of Ramgarh, Lohardaga, Simdega, Hazaribag, Bokaro and Ranchi, where the per centage of all-weather road connectivity is above 25 per cent. The least connected districts are Chatra and Deoghar, where the per centage of villages with all-weather road is below 13 per cent. The problem is compounded in some districts which have no railway connectivity as is the case in Chatra.

The spatial pattern of the level of rural accessibility in Jharkhand depicts (Map 1) that the central region of the state around the state and district capital of Ranchi is well connected, however the maximum rural connectivity is present in the eastern region mainly covering the blocks in the district of Dhanbad. In this district the villages under the CD block of Jharia-Cum-Jorap-Onkar-Cum-Sindri has full connectivity. Above 60 per cent of the villages with all-weather road are found in the blocks of Baliapur and Baghmara in Dhanbad district, and in the block of Bermo in Bokaro district. Moderate levels of accessibility ranging from 80 to 40 per cent are found in the blocks of Dhanbad and Gobindpur in the district of Dhanbad, Musabani block in Purbi Singhbhum, Hazaribag block in Hazaribag district, Bhandra block in Lohardaga, Daltangra in Palamu.

Railway transport is the second means of rural transport in Jharkhand. This service has developed primarily for goods transport. Only 1.1 per cent of the villages are connected with railway connections (Table 1). The districts of Hazaribag, Bokaro, Dhanbad and Lohardaga have comparatively better rail connectivity. The district of Chatra has no railway connectivity. In regard to provision of bus services to rural areas, Simdega district has better position followed by Gumla, Palamu and Ranchi. The provision of bus services is poorly developed in Lohardaga and Chatra. Thus, the status of rural transport facilities in the state of Jharkhand is also poorly developed in comparison to the all-India picture.

### **Spatial pattern of Personal Mobility in Jharkhand**

In rural areas the ownership of any means of transport is regarded as an advantage because these areas mostly lack transport provisions both public and private. Personal mobility is a factor of 'Potential accessibility' which is determined by various factors such as physical fitness and car ownership, as well as public transport availability (Nutley, 1998, p.187). However, at the present level personal mobility involves the ownership of transport vehicles (motorized and non-motorized). Motorized transport vehicles (both two wheelers and four wheelers) provide better transport accessibility for long distance travels and ease

of journeys in rural areas where service facilities are often distantly located.

The ownership of motorised transport vehicles (both two wheelers and four wheelers) in Jharkhand is poor far below the national average both in 2001 and 2011.

**Table 1: Transport and Communication Facilities in Jharkhand Villages, 2001**

S I . No.	District	Facilities			Approach to			Total	Facilities			Approach to		
		Commu- nication	Bus	Railway Service	All- weather Road	Mud Road	Foot Path	Villa- ges	Commu- nication	Bus	Rail way Service	All- weather Road	Mud Road	Foot Path
		Number of Villages							Per centage of Villages					
1	Bokaro	72	61	9	158	585	464	621	11.6	9.8	1.4	25.4	94.2	74.7
2	Chatra	54	51	0	172	1198	837	1343	4.0	3.8	0.0	12.8	89.2	62.3
3	Deoghar	174	146	40	304	2138	1273	2356	7.4	6.2	1.7	12.9	90.7	54.0
4	Dhanbad	101	77	22	482	993	641	1121	9.0	6.9	2.0	43.0	88.6	57.2
5	Dumka	203	186	3	495	2427	1604	2666	7.6	7.0	0.1	18.6	91.0	60.2
6	Garhwa	105	99	5	180	800	670	858	12.2	11.5	0.6	21.0	93.2	78.1
7	Giridih	150	125	21	474	2246	1748	2532	5.9	4.9	0.8	18.7	88.7	69.0
8	Godda	106	104	1	341	1261	947	1633	6.5	6.4	0.1	20.9	77.2	58.0
9	Gumla	134	129	10	167	864	633	944	14.2	13.7	1.1	17.7	91.5	67.1
10	Hazaribag	101	92	2	322	1042	542	1235	8.2	7.4	0.2	26.1	84.4	43.9
11	Jamtara	100	96	3	198	976	543	1071	9.3	9.0	0.3	18.5	91.1	50.7
12	Khunti	50	45	5	169	660	379	754	6.6	6.0	0.7	22.4	87.5	50.3
13	Kodarma	54	47	6	116	462	326	526	10.3	8.9	1.1	22.1	87.8	62.0
14	Latehar	94	84	13	169	702	636	745	12.6	11.3	1.7	22.7	94.2	85.4
15	Lohardaga	11	7	7	99	319	142	352	3.1	2.0	2.0	28.1	90.6	40.3
16	Pakur	99	94	10	198	801	589	1128	8.8	8.3	0.9	17.6	71.0	52.2
17	Palamu	258	221	27	412	1569	1107	1720	15.0	12.8	1.6	24.0	91.2	64.4
18	Pashchimi Singhbhum	186	179	13	367	1516	894	1639	11.3	10.9	0.8	22.4	92.5	54.5
19	P u r b i Singhbhum	184	160	10	266	1480	712	1610	11.4	9.9	0.6	16.5	91.9	44.2
20	Ramgarh	66	32	37	114	264	126	308	21.4	10.4	12.0	37.0	85.7	40.9
21	Ranchi	173	164	24	335	1200	813	1298	13.3	12.6	1.8	25.8	92.4	62.6
22	Sahibganj	79	52	22	300	914	952	1307	6.0	4.0	1.7	23.0	69.9	72.8
23	Saraikela Kharsawan	71	60	12	258	1066	617	1138	6.2	5.3	1.1	22.7	93.7	54.2
24	Simdega	92	84	8	120	399	280	449	20.5	18.7	1.8	26.7	88.9	62.4
	Total	2717	2395	310	6216	25882	17475	29354	9.3	8.2	1.1	21.2	88.2	59.5

Source: Census of India, 2001, Jharkhand Village Directory.

The household Ownership of two wheeler motorised transport vehicles comprising of Scooter, Motorcycle or Moped was 16.1 per cent as against the national average of 21.0 per cent in 2011. The household ownership of four wheeler motorised transport vehicles comprising of car, jeep or van was 2.8 per cent against the national average of 4.7 per cent in 2011. The ownership of motorised two wheeler transport is low, with 3.97 household

having scooter or motorcycle in 2001 which increased to 9.45 per cent in 2011. The ownership of motorised four wheeler transport is the lowest among transport assets. It was 0.58 per cent in 2001 and increased to 1.10 per cent in 2011. The state is marginally better off in comparison to its adjoining states of Chhattisgarh, Odisha, West Bengal and Bihar in 2011.

**Table 2 : Statewise Ownership of Transport Vehicles in India, 2011**

Sl. No.	India/ State/ Union Territory #	Households having assets			
		Total No. of Households (Excluding institutional households)	Bicycle	Scooter, Motor cycle, Moped	Car, Jeep, Van
	India	246692667	44.8	21	4.7
1	Lakshadweep	10703	84.3	38.4	2.3
2	Uttar Pradesh	32924266	67.8	19.6	3.8
3	Punjab	5409699	66.4	47.5	13.1
4	Odisha	9661085	61.0	14.5	1.8
5	Chhattisgarh	5622850	61.0	15.6	2.3
6	Jharkhand	6181607	58.8	16.1	2.8
7	Chandigarh	235061	57.5	46.7	25.7
8	West Bengal	20067299	57.2	8.5	2.2
9	Assam	6367295	55	10.2	3.8
10	Puducherry	301276	51.5	46.6	5.6
11	Bihar	18940629	48.7	8.1	1.7
12	Tamil Nadu	18493003	45.2	32.3	4.3
13	Haryana	4717954	44.8	33.3	10.5
14	Manipur	507152	44.6	19.8	6
15	Madhya Pradesh	14967597	39.7	18.8	2.7
16	Tripura	842781	39.3	8.2	2.2
17	Gujarat	12181718	34.8	34.1	6.1
18	Karnataka	13179911	33.9	25.6	6.3
19	Andhra Pradesh	21024534	32.1	18.6	2.7
20	Uttarakhand	1997068	31.3	22.9	6.2
21	NCT of Delhi	3340538	30.6	38.9	20.7
22	Maharashtra	23830580	30.5	24.9	5.9
23	Daman & Diu	60381	30.4	31.5	5.9
24	Rajasthan	12581303	28.6	24.1	4.7
25	Goa	322813	24.6	56.9	24.6
26	Dadra & Nagar Haveli	73063	24.4	25.5	5.7
27	Kerala	7716370	20.5	24.1	10.2
28	Arunachal Pradesh	261614	19.5	14	7.9
29	A & N Islands	93376	18.3	24.7	6.9
30	Meghalaya	538299	13.3	5.4	5.4
31	Jammu & Kashmir	2015088	10.3	12.9	7.5
32	Himachal Pradesh	1476581	9.5	15.5	8.3
33	Nagaland	399965	7.9	6.3	7.8
34	Mizoram	221077	4.3	13.8	7.3
35	Sikkim	128131	0.9	2.8	8.3

Source: Census of India, 2011, Household Assets

The spatial pattern of personal mobility in terms of motorized transport vehicles show vast regional disparities as the better performance of personal mobility are concentrated in limited areas leaving vast areas of disadvantages in the state.

**Table 3 : Mode of Transport in Rural India, 2001-2011 and Ranking of States based on Cycle as Mode of Transport 2011**

State/Union Territory	Total households		Bicycle		Scooter/ Motorcycle/ Moded		Car/ Jeep/ Van		None of the specified mode of transportation	
	2011	2001	2011	2001	2011	2001	2011	2001	2011	2001
India	16782673	138271559	46.20	42.80	14.30	6.70	2.30	1.30	47.20	54.50
Punjab	3315632	2775462	72.30	74.10	44.80	27.00	10.00	3.70	18.30	22.00
Uttar Pradesh	25475071	20590074	71.50	71.10	15.30	6.70	2.30	1.50	24.90	27.30
Jharkhand	4685965	3802412	60.80	49.30	9.50	4.00	1.10	0.60	36.20	49.50
Chhattisgarh	4384112	3359078	60.60	58.20	9.30	5.90	0.80	0.60	37.10	39.80
Odisha	8144012	6782879	60.00	49.40	9.80	4.50	0.90	0.60	37.20	49.40
West Bengal	13717186	11161870	58.20	54.30	5.70	3.10	1.20	1.20	40.40	44.70
Assam	5374553	4220173	56.90	47.00	7.60	3.30	2.10	1.20	41.10	52.00
Bihar	16926958	12660007	48.80	40.10	6.60	2.40	1.40	0.70	48.60	59.00
Tamil Nadu	9563899	8274790	46.10	39.90	25.50	10.70	1.80	1.10	43.20	56.60
NCT of Delhi	79115	169528	44.20	48.70	38.50	20.70	10.80	7.30	34.70	38.90
Haryana	2966053	2454463	43.00	46.20	27.90	13.20	5.80	2.40	42.20	48.60
Manipur	335752	296354	40.80	31.80	12.90	7.00	3.60	2.00	54.00	65.50
Tripura	607779	539680	36.80	27.60	4.70	2.00	1.30	0.80	60.20	71.10
Karnataka	7864196	6675173	36.50	27.80	16.90	7.30	2.50	1.40	54.20	68.40
Madhya Pradesh	11122365	8124795	36.40	38.30	12.00	6.00	1.10	0.90	57.20	59.00
Andhra Pradesh	14246309	12676218	31.40	30.00	11.20	5.10	0.90	0.50	61.20	67.40
Maharashtra	13016652	10993623	30.20	28.30	18.50	8.00	2.40	1.60	59.30	67.80
Gujarat	6765403	5885961	29.00	29.30	23.00	11.80	2.80	1.80	56.40	64.10
Uttarakhand	1404845	1196157	27.50	25.90	15.10	6.20	3.30	1.30	65.20	71.60
Rajasthan	9490363	7156703	24.20	31.70	17.30	7.30	2.90	1.70	64.10	64.40
Goa	124674	140755	22.80	30.60	51.80	33.20	17.90	6.80	37.50	50.00
Arunachal Pradesh	195723	164501	20.10	16.40	11.30	4.40	5.30	1.40	69.20	79.90
Kerala	4095674	4942550	15.90	15.70	19.70	7.40	8.00	2.90	66.80	78.40
Meghalaya	422197	329678	14.90	11.80	3.90	1.50	2.80	1.30	80.90	86.40
Himachal Pradesh	1310538	1097520	9.30	9.10	14.40	6.20	6.70	1.80	76.50	85.90
Jammu & Kashmir	1497920	1161357	7.40	9.20	7.90	3.90	3.60	1.50	84.80	87.50
Nagaland	284911	265334	7.20	7.60	5.00	2.00	5.00	2.40	84.90	89.00
Mizoram	104874	79362	2.80	2.30	7.20	2.50	2.50	1.10	89.10	94.70
Sikkim	92370	91723	0.60	0.40	2.40	1.40	5.30	1.50	92.40	97.00

Source: Census of India, 2011

It is comparatively high in the east central mining areas of Dhanbad and Ramgarh followed by the industrial and manufacturing areas of Bokaro, Purbi Singhbhum and Ranchi located in the east central and south eastern part of the state in 2001 (Table 5).

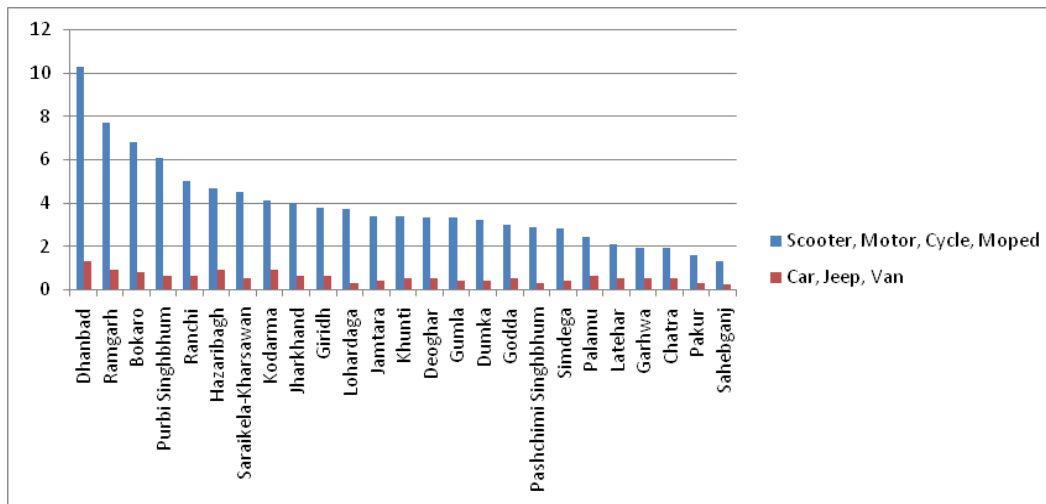
**Table 4 : Per centage of Rural Households Owning Transport Assets (2001-11)**

Rural		number of assets			per centage of household owning		
Jharkhand	Total no of house hold	Bicycle	Scooter/ Motorcycle	Car/ Jeep/ Van	Bicycle	Scooter/ Motorcycle	Car/ Jeep/ Van
2011	4685965	2848226	442950	51760	60.78	9.45	1.10
2001	3802412	1873209	151114	22012	49.26	3.97	0.58
G r o w t h '2001-2011		52.05	193.12	135.14			

Source: Census of India, 2001 and 2011

The same trend is observed for the 2011 census (Table 6). The districts located in the north eastern region, north western and southern western parts of the state shows low personal mobility in terms of ownership of motorized transport vehicles (Chart 1).

**Chart 1 : Ownership of Motorised Transport vehicles in Rural Jharkhand 2001**



Bicycles are the predominant non-motorised modes of transport and are regarded to be “faster, safer and more reliable than walking and cheaper than motorised transport” (Heyen-Perschen, 2001, p.10). However, when facilities are distantly located as is the case in most rural locations in India and Jharkhand in particular, this facility has limitations.

In India, the share of non-motorised means of personal transport mainly bicycles are more than motorized means of personal transport. The ownership of non-motorized transport was 44.8 per cent in India in 2011. It goes as high as 84.3 per cent in Lakshadweep followed by Punjab, Odisha (Orissa), Chhattisgarh, Jharkhand, Chandigarh, West Bangal, Assam, Puduchery



(Pondichery), Bihar, Tamilnadu and Haryana which lies above the national average (Table 2).

**Table 5 : Ownership of Transport Vehicles among Rural Households in Jharkhand, 2001**

S l . No.	District	Total number of households	Numbers			Per centage		
			Bicycle	Scooter, Motor, Cycle, Moped	Car, Jeep, Van	Bicycle	Scooter, Motor, Cycle, Moped	Car, Jeep, Van
1	Jamtara	1,06,727	69,445	3,660	396	65.1	3.4	0.4
2	Lohardaga	61,100	39,575	2,278	202	64.8	3.7	0.3
3	P u r b i Singhbhum	1,76,969	1,08,808	10,787	1,149	61.5	6.1	0.6
4	Ranchi	2,63,497	1,58,568	13,045	1,573	60.2	5	0.6
5	Simdega	94,448	55,040	2,671	415	58.3	2.8	0.4
6	Deoghar	1,66,501	96,242	5,487	760	57.8	3.3	0.5
7	Dhanbad	2,05,914	1,17,909	21,131	2,678	57.3	10.3	1.3
8	Saraikela- Kharsawan	1,36,991	77,543	6,120	751	56.6	4.5	0.5
9	Bokaro	1,71,904	95,151	11,639	1,387	55.4	6.8	0.8
10	Gumla	1,49,241	82,738	4,945	635	55.4	3.3	0.4
11	Khunti	80,378	44,266	2,748	368	55.1	3.4	0.5
12	Ramgarh	90,897	48,119	6,987	810	52.9	7.7	0.9
13	Hazaribagh	2,12,021	1,07,145	9,893	1,845	50.5	4.7	0.9
14	Kodarma	66,657	31,774	2,744	585	47.7	4.1	0.9
15	Giridh	2,86,647	1,36,023	10,854	1,779	47.5	3.8	0.6
16	Pashchimi Singhbhum	2,11,120	97,795	6,138	710	46.3	2.9	0.3
17	Dumka	2,09,983	93,163	6,687	823	44.4	3.2	0.4
18	Godda	1,90,107	76,589	5,716	932	40.3	3	0.5
19	Garhwa	1,71,674	68,669	3,225	910	40	1.9	0.5
20	Chatra	1,25,198	49,211	2,436	595	39.3	1.9	0.5
21	Palamu	2,40,110	91,951	5,727	1,456	38.3	2.4	0.6
22	Pakur	1,26,943	48,191	2,078	358	38	1.6	0.3
23	Latehar	99,340	35,259	2,088	528	35.5	2.1	0.5
24	Sahebganj	1,58,045	44,035	2,030	367	27.9	1.3	0.2
	Jharkhand	38,02,412	18,73,209	1,51,114	22,012	49.3	4	0.6

Source: Census of India 2001, Household Table

The non-motorised mode of transport predominates in the rural areas of Jharkhand as the state ranks third only after Punjab and Uttar Pradesh in terms of ownership of bicycles. In 2011, the state ranks above the national average and also above the neighbouring states of Chhattisgarh,



Odisha (Orissa), West Bengal and Bihar in terms of bicycle ownership (Table 2). The non-motorised mode of transport (bicycle) is even higher than the ownership. It was 49.26 per cent in 2001 and increased to 60.78 per cent in 2011 in Jharkhand, recording a growth of 52.05 per cent between 2001 and 2011 (Table 3 and 4).

**Table 6 : Ownership of Transport Vehicles among Rural Households in Jharkhand, 2011**

District	Total number of households	Bicycle	Scooter/ Motorcycle / Moped	Car/ Jeep/ Van	Bicycle	Scooter/ Motorcycle / Moped	Car/ Jeep/ Van
JHARKHAND	4685965	2848226	442950	51760	60.78	9.45	1.10
Jamtara	135540	106962	12727	1175	78.92	9.39	0.87
Purbi Singhbhum	215676	161998	23446	2024	75.11	10.87	0.94
S a r a i k e l l a - Kharsawan	165883	124254	19245	1647	74.90	11.60	0.99
Lohardaga	80295	60065	6563	589	74.81	8.17	0.73
Simdega	108683	80965	7175	827	74.50	6.60	0.76
Khunti	93762	66238	5425	602	70.64	5.79	0.64
Gumla	176770	124484	12390	1470	70.42	7.01	0.83
Ranchi	322679	225649	40310	4295	69.93	12.49	1.33
Deoghar	214896	148401	19746	1798	69.06	9.19	0.84
Dhanbad	207157	141029	40393	3476	68.08	19.50	1.68
Bokaro	204021	134960	29155	3693	66.15	14.29	1.81
Dumka	255926	165495	17831	2034	64.67	6.97	0.79
P a s h c h i m i Singhbhum	256019	158200	16758	1756	61.79	6.55	0.69
Ramgarh	97889	59908	17308	2092	61.20	17.68	2.14
Giridih	356247	207359	46983	4680	58.21	13.19	1.31
Pakur	167362	96550	7798	707	57.69	4.66	0.42
Hazaribagh	252871	141978	34289	4992	56.15	13.56	1.97
Godda	239500	126375	16003	1272	52.77	6.68	0.53
Kodarma	90207	45462	11615	1321	50.40	12.88	1.46
Chatra	170239	85487	12179	1638	50.22	7.15	0.96
Latehar	122902	58912	5910	850	47.93	4.81	0.69
Palamu	316135	142492	19004	5805	45.07	6.01	1.84
Sahibganj	193809	82465	7094	848	42.55	3.66	0.44
Garhwa	241497	102538	13603	2169	42.46	5.63	0.90

Source: Census of India, 2011

## Conclusion

The regional disparity in terms of rural transport accessibility in Jharkhand is significant as vast regions of under provisions of transport infrastructure and limited personal mobility prevails. The spatial pattern of transport provision shows that development is concentrated

in few regions mostly along the mining and industrial centers located in the east central and south eastern parts of the state thereby leaving vast areas which are deficient in transport provisions. The spatial pattern of personal mobility also shows a similar pattern with the advantaged regions, in terms of better transport provisions, performing better in terms of personal mobility and the disadvantaged regions are further handicapped with poor personal mobility. Thus, the challenges of development in the state, ridden by significant transport disadvantages which are widespread, needs to be addressed as a priority for policy planning in the state. The multiple and overlapping development deficiencies with vast inter regional disparities should be narrowed down and the state should aim for more inclusive and balanced regional development.

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