



A Geospatial Analysis of the Nature and Spatial Extent of Disabled Persons in India

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Abstract

Disability is conceptualised as a complex process involving bodily functions, health, environment, activity limitations and restrictions in social participation (WHO, 2001). According to World report on disability (WHO, 2011), 15% of the population globally, presents with disabilities, with physical disability being most prevalent. The size of disabled persons is gradually increasing due to rapid population growth, increasing ageing population, ancestral diseases, and emergence of new diseases. The concentration of disabled persons varies from place to place and time to time due to the variation of different factors, i.e. poverty, malnutrition, poor health condition, sanitation, unsafe living and working condition. In this paper an attempt has been made to examine the spatial patterns of disabled persons in India. The research paper is exclusively based on secondary sources of data which have been mainly collected from Census of India publications, New Delhi. Simple percentage technique has been applied to analyze the data and side by side Map Info software is also used to visualize the data. The data shows that majority of the states are facing the burden of higher concentration of disabled persons in India. Study also reveals that burden of disability is more pronounced in the north-western as well as central-eastern parts of the country. Disability is more pronounced among males as compared to females, and urban areas of India are more hassle-free in respect of disabled persons than rural areas.

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Introduction

Disabled persons are very oppressed in our society and are very neglected not only in socio-economic terms but also in mental perspectives. Presently many researchers and planners have laid their attention towards disabled persons especially in developing countries like India. People with disabilities are the largest minority group in the world. As a group they are starved of services and facilities available to the non-disabled and consequently, they are the least nourished, the least healthy, the least educated and the least employed (Mishra *et al.*, 2006). People with disabilities are often treated as a homogenous group (Premeaux, 2001).

World Health Organization defines disability as "any restriction or lack of ability to perform any activity in a manner or within a range considered normal for a human being (WHO, 1996). Definition of disability varies from country to country, as concept of disability changes from region to region. Zimbabwe Department

of Social Service (1982) has defined disability as "a physical or mental condition, which makes it difficult or impossible for the person concerned to adequately fulfill his or her normal role in the society". Although, in 1995, the Govt. of India passed the persons with Disabilities (Equal opportunities, Protection of Rights and Full Participation) Act, commonly known as 'PwD Act'. As per section 2 (i) of the Act, Disability is defined as: blindness, low vision, leprosy-affected, hearing impairment, locomotor disability, mental retardation and mental illness. As per Sec 2 (t) of the Act, 'persons with disability' means a person suffering from not less than forty (40) per cent of any disability as certified by the medical authority. United Nation Conservation for Rights of Persons with Disability states that persons with disabilities include those who have long-term physical, mental, intellectual or sensory impairments that, in the face of various negative attitudes or physical obstacles, may prevent those persons from participating fully in society. "Disability is therefore not

defined as a standalone medical condition, but rather as the product of the interaction between the environment broadly defined and the health condition of a particular person" (UNDP India).

Literature Review

Very little research has been done on disabled persons, especially in Indian context. Although, some literature is available for understanding the disability. Barker *et al.* (1952) have estimated the numbers of physically disabled children of Jefferson County, Kansas from teachers, laymen and physicians. They concluded that teachers were most aware of disorder of speech, vision and physique. Lay informants were most sensitive to visual, and physical disabilities and physicians were most aware of orthopedic, central nervous system and heart disabilities. Das *et al.* (1998) analyzed the patterns of physical disability in India and also examined the relation between the male and the female disability rates and identified the gender bias in each.

Medical Research Council Cognitive Function and Ageing Study (MRC CFAS) and Resource Implications Study (RIS MRC CFAS, 1999) studied the extent of cognitively impaired and physically disabled elderly people in England and Wales. The study reflects that the disability is not present or absent, but rather a matter of degree. On the respective study definitions for disability 1.3 million elderly people in England and Wales are classified as disabled or cognitively impaired. This study further demonstrated that disabled elderly people visit hospitals extensively, underlying the interrelations between acute and long term care.

Hammoud *et al.* (1992) have studied that socio-demographic characteristic of physically disabled persons in Canada, where they observed that physically disabled people will have higher rates of unemployment and are less likely to be in a continuing marital relationship. They are more likely to be unhappy and to get relatively little satisfaction from their life experience and this is because of economic reasons. Weinberg (1983) has described that how personal rights of the physically disabled are violated in public situation and examined how the disabled react to these violations.

A study on the concept of disability index have been done by Mishra *et al.* (2006) which measures the deprivation suffered by the disabled persons. This study also measured the condition of disabled in India and concluded that the disabled are being bypassed in the process of economic growth. Mitra *et al.* (2006) have examined the employment patterns of persons with disabilities in India, where they found that employment rates among disabled persons are relatively less than non-disabled persons, with great variations across gender, urban-rural sector and states.

Turner *et al.* (1988) have performed the longitudinal analysis of physically disabled and risk for depression and also showed that the extent of increased risk appears to be slightly higher among men

than women and somewhat greater for those who are 65 and older than those who are comparatively younger. Study further shows that physical disability is associated with significantly increased risk for depression regardless of gender or age. Hosain *et al.* (2002) have examined the impact of disability in the quality of life of disabled people in rural Bangladesh. This study showed that disability had a devastating effect on quality of life of the disabled people with a particularly negative effect on their marriage, educational attainment, employment and emotional state. Study also showed that women and girl children are more affected than men.

Objectives

The main objectives of the study are:

- 1) To analyze the spatial patterns of total, rural and urban disabled persons among the states and union territories of India.
- 2) To examine the male-female differentials in the distribution of disabled persons in India.
- 3) To study the growth rate of disability across the country.
- 4) To identify the disabled concentrated areas in the study area.

Data Source and Methodology

The entire study is exclusively based on secondary sources of data which have been collected from Census of India publications, New Delhi. The raw data for each state and union territory are converted into percentage to total population of the same state or union territory. Simple percentage method is followed to analyze the data. The entire percentage value of disabled persons are categorized into three grades namely, high (more than 2 per cent), medium (1 per cent to 2 per cent) and low (below 1 per cent) in respect of total, rural and urban disabled persons. Apart from this, location quotient technique also has been applied to analyze the disability concentrated areas. Besides, advanced cartographic techniques and GIS-Map Info programme (version 7.0) have been applied to show the regional variation of disabled persons among the states and union territories of India through maps.

Results and Discussion

Table 1 depicts the percentage values of total, rural and urban disabled persons among the states and union territories of India. The percentage of total disabled persons varies from 0.90 to 2.99 % with the maximum in Sikkim (2.99 %) and minimum in Daman & Diu (0.90 %). Maximum total male disability is observed in Jammu & Kashmir (3.07 %) and minimum is found in Daman & Diu (0.87 %), while, maximum total female disability is observed in Odisha (2.75 %), while, lowest is found in Daman & Diu (0.97 %). The distribution of rural disabled persons varies from 1.07 to 3.48 % with the maximum in Sikkim (3.48 %) and minimum in Dadra & Nagar

Haveli (1.07 %). Maximum rural male disability is found in Sikkim (3.52 %), while, lowest is observed in Dadra & Nagar Haveli (1.12 %). And majority of rural female disability belongs to Sikkim (3.42 %) and lowest is again in Dadra & Nagar Haveli (1.01 %).

The distribution of urban disabled persons varies from 0.78 to 2.66 % with the highest in Andhra Pradesh (2.90 %) and lowest in Daman & Diu (0.78 %). Maximum urban male disability is observed in Andhra Pradesh (2.66 %), while, minimum is observed in Daman & Diu (0.72 %). And majority of female disability is also most in Andhra Pradesh (2.44 %) and lowest in Dadra & Nagar Haveli (0.83 %). The entire range of variations of total disabled persons is categorized into three grades, namely, high (above 2.0 %), medium (1.0 to 2.0 %) and low (below 1.0 %) (Table 2).

The geographical distribution of total disabled persons is shown in figure 1. The figure reveals that above 57 % states and union territories have high level of disabled persons, which stretches from Jammu & Kashmir in the north to Kerala in the south and Rajasthan in the west to West Bengal in the east and make a very large region in the country. Nearly 6 % states / union territories come under low category of disabled persons and remaining 37 % states / union territories fall into medium category of disabled persons, which are dispersly located in the country.

The entire range of variations of rural disabled persons is categorized into three grades, namely, high (above 2.0 %), medium (1.0 to 2.0 %) and low (below 1.0 %) (Table 3). The spatial distribution of rural disabled persons is shown in figure 2. The figure reveals that nearly 63 % states and union territories fall into high level of disabled persons, stretching from Jammu & Kashmir in the north to Kerala in the south, Rajasthan in the west to West Bengal in the east, thereby making a very big region. Remaining states / union territories have come under medium category of rural disabled persons, which are dispersedly located in the country. No states / union territories fall into low category of rural disabled persons.

The entire range of variations of urban disabled persons is categorized into three grades, namely, high (above 2.0 %), medium (1.0 to 2.0 %) and low (below 1.0 %) (Table 4). The regional distribution of urban disabled persons is shown in figure 3. The figure depicts that 60 % states and union territories come under high level of disabled persons, stretching from Jammu & Kashmir in the north to Kerala in the south, Rajasthan in the west to West Bengal in the east and make a huge region. Nearly 6 % of urban disabled persons fall into low category and remaining states / union territories come under medium category of disabled persons which are dispersly located in the country.

Table 5 shows the higher concentration of disabled persons in the states and union territories of India. Figure 4 reveals that nearly 43 % states and union territories have high concentration of disabled persons,

which are mainly distributed into two separate parts i.e., north-western parts, including the states namely, Jammu & Kashmir, Himachal Pradesh, Punjab and Rajasthan and central-eastern parts including the states and union territories namely, Sikkim, Bihar, Jharkhand, Odisha, Chhattisgarh, Maharashtra, Goa, Andhra Pradesh and Lakshadweep and Puducherry and make a large burden region in the country. Remaining portions of the country are enjoying comparatively more hassle free condition in respect of disabled persons.

The entire range of variations of temporal changes among disabled persons is categorized into three grades, namely, high (more than 1.0 %), medium (0.0 to 1.0 %) and low (below 0.0 %) (Table 6). The geographical distribution of growth rate of disabled persons in India is shown in figure 5. The figure reveals that nearly 6 % states have high level of growth rate of disabled persons, while, majority of the states / union territories (nearly 63 %) have negative growth rate of disabled persons and rest fall into medium growth rate of disabled person.

Conclusion

The distribution of disabled persons varies from place to place and time to time. The study found out that majority of the states and union territories are facing high level of problems of total, rural and urban disability by making a very big region in the country. Study discovered that the disability is more pronounced in the countryside than urban areas in the country. The study also found out that among males disability is more pronounced than females in the study area. North eastern states i.e., Assam, Arunachal Pradesh, Nagaland, Manipur, Meghalaya, Mizoram, and Tripura, western states Gujarat, northern states Uttarakhand, Himachal Pradesh, and southern states Tamil Nadu are more hassle free states in the country in respect of disability, while, north western sides and central eastern parts of the country are marked as more disability concentrated areas in the country. Study also found out that majority of the states / union territories have negative growth rate of disabled persons. Higher growth rate of disabled persons are observed in the western sides of the country. .

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Table – 1: Distribution of Disabled Persons in India, 2011.

States / UTs	Disabled Persons in India (%)								
	Total			Rural			Urban		
	Persons	Male	Female	Person	Male	Female	Persons	Male	Female
Jammu & Kashmir	2.88	3.07	2.66	3.00	3.24	2.75	2.55	2.68	2.38
Himachal Pradesh	2.27	2.48	2.04	2.31	2.54	2.08	1.84	1.98	1.67
Punjab	2.36	2.59	2.10	2.48	2.76	2.17	2.15	2.31	1.97
Chandigarh	1.40	1.51	1.28	1.19	1.24	1.13	1.41	1.51	1.28
Uttarakhand	1.83	1.99	1.66	1.91	2.08	1.73	1.66	1.83	1.51
Haryana	2.16	2.34	1.95	2.16	2.38	1.92	2.14	2.26	1.99
NCT of Delhi	1.40	1.54	1.24	1.46	1.62	1.27	1.40	1.54	1.24
Rajasthan	2.28	2.38	2.17	2.37	2.46	2.27	2.02	2.17	1.86
Uttar Pradesh	2.08	2.26	1.89	2.04	2.23	1.83	2.23	2.39	2.05
Bihar	2.25	2.48	1.99	2.22	2.46	1.96	2.43	2.62	2.20
Sikkim	2.99	3.04	2.94	3.48	3.52	3.41	1.53	1.53	1.50
Arunachal Pradesh	1.93	1.98	1.89	2.09	2.16	2.02	1.41	1.47	1.31
Nagaland	1.50	1.57	1.41	1.67	1.76	1.58	1.06	1.13	0.99
Manipur	1.99	2.10	1.87	1.90	1.88	1.68	2.20	2.29	2.04
Mizoram	1.39	1.48	1.29	1.63	1.70	1.58	1.16	1.26	1.02
Tripura	1.75	1.90	1.60	1.66	1.78	1.53	2.02	2.23	1.80
Meghalaya	1.50	1.56	1.43	1.59	1.64	1.53	1.13	1.26	1.01
Assam	1.54	1.61	1.46	1.55	1.63	1.47	1.47	1.55	1.39
West Bengal	2.21	2.40	2.00	2.20	2.41	1.98	2.23	2.40	2.05
Jharkhand	2.34	2.52	2.14	2.39	2.57	2.19	2.17	2.36	1.96
Odisha	2.97	3.18	2.75	3.05	3.28	2.82	2.53	2.71	2.33
Chhattisgarh	2.45	2.60	2.29	2.54	2.69	2.39	2.13	2.32	1.94
Madhya Pradesh	2.14	2.36	1.90	2.10	2.33	1.87	2.22	2.46	1.97
Gujarat	1.81	1.95	1.66	1.65	1.81	1.47	2.03	2.12	1.92
Daman & Diu	0.90	0.87	0.97	1.29	1.39	1.16	0.78	0.72	0.88
Dadra & Nagar Haveli	0.96	0.98	0.94	1.07	1.12	1.01	0.84	0.83	0.83
Maharashtra	2.64	2.90	2.35	2.71	3.01	2.38	2.55	2.78	2.30
Andhra Pradesh	2.68	2.88	2.47	2.69	2.88	2.49	2.66	2.90	2.44
Karnataka	2.17	2.34	1.99	2.11	2.32	1.91	2.25	2.39	2.10
Goa	2.26	2.30	2.23	2.65	2.72	2.59	2.03	2.06	2.00
Lakshadweep	2.51	2.53	2.48	2.80	2.60	3.02	2.42	2.51	2.33
Kerala	2.28	2.46	2.11	2.38	2.57	2.20	2.18	2.35	2.02
Tamil Nadu	1.64	1.82	1.45	1.67	1.86	1.48	1.60	1.78	1.42
Puducherry	2.43	2.68	2.18	2.68	3.02	2.35	2.31	2.51	2.09
Andaman & Nicobar Islands	1.75	1.91	1.58	2.00	2.24	1.85	1.31	1.34	1.13
India	2.22	2.40	2.02	2.24	2.43	2.03	2.17	2.34	1.98

Source: Computed by authors, Data extracted from Census of India, 2011.

Table – 2: Category wise Distribution of Total Disabled Persons in India, 2011.

Category	Concentration	No. of States / UTs	% of States / UTs	Name of the States / UTs
High	> 2.0	20	57.14	Sikkim, Odisha, Jammu & Kashmir, Andhra Pradesh, Maharashtra, Lakshadweep, Chhattisgarh, Puducherry, Punjab, Jharkhand, Kerala, Rajasthan, Himachal Pradesh, Goa, Bihar, West Bengal, Karnataka, Haryana, Madhya Pradesh, Uttar Pradesh
Medium	1.0 - 2.0	13	37.14	Manipur, Arunachal Pradesh, Uttarakhand, Gujarat, Andaman & Nicobar Islands, Tripura, Tamil Nadu, Assam, Nagaland, Meghalaya, Chandigarh, NCT of Delhi, Mizoram
Low	< 1.0	2	5.72	Dadra & Nagar Haveli, Daman & Diu
Total		35	100	

Source: Based on Table 1.

Table – 3: Category wise Distribution of Rural Disabled Persons in India, 2011

Category	Concentration	No. of State UTs	% of States / UTs	Name of the States / UTs
High	> 2.0	22	62.86	Sikkim, Odisha, Jammu & Kashmir, Lakshadweep, Maharashtra, Andhra Pradesh, Puducherry, Goa, Chhattisgarh, Punjab, Jharkhand, Kerala, Rajasthan, Himachal Pradesh, Bihar, West Bengal, Haryana, Karnataka, Madhya Pradesh, Arunachal Pradesh, Uttar Pradesh, Andaman & Nicobar Islands
Medium	1.0 - 2.0	13	37.14	Uttarakhand, Manipur, Nagaland, Tamil Nadu, Tripura, Gujarat, Mizoram, Meghalaya, Assam, NCT of Delhi, Daman & Diu, Chandigarh, Dadra & Nagar Haveli
Low	< 1.0	0	0.00	
Total		35	100	

Source: Based on Table 1.

Table – 4: Category wise Distribution of Urban Disabled Persons in India, 2011

Category	Concentration	No. of State / UTs	% of States / UTs	Name of the States / UTs
High	> 2.0	21	60.00	Andhra Pradesh, Jammu & Kashmir, Maharashtra, Odisha, Bihar, Lakshadweep, Puducherry, Karnataka, Uttar Pradesh, West Bengal, Madhya Pradesh, Manipur, Kerala, Jharkhand, Punjab, Haryana, Chattisgarh, Gujarat, Goa, Tripura, Rajasthan
Medium	1.0 - 2.0	12	34.29	Himachal Pradesh, Uttarakhand, Tamil Nadu, Sikkim, Assam, Arunachal Pradesh, Chandigarh, NCT of Delhi, Andaman & Nicobar Islands, Mizoram, Meghalaya, Nagaland
Low	< 1.0	2	5.71	Dadra & Nagar Haveli, Daman & Diu
Total		35	100	

Source: Based on Table 1.

Table – 5: Concentration of Disabled Persons in India, 2011

Concentration	Location Quotient	No of States / UTs	% of States / UTs	Name of the States / UTs
High	> 1.0	15	42.86	Sikkim, Odisha, Jammu & Kashmir, Andhra Pradesh, Maharashtra, Lakshadweep, Chhattisgarh, Puducherry, Punjab, Jharkhand, Rajasthan, Kerala, Goa, Himachal Pradesh, Bihar
Total		35	100	

Table – 6: Category wise Distribution of Growth rate of Disabled Persons in India, (2001 – 2011).

Category	Concentration	No of States/UTs	% of States/UTs	Name of the States / Union Territories
High Growth	> 1.0	2	5.71	Goa, Maharashtra
Low Growth	0.00 - 1.0	11	31.43	Andhra Pradesh, Manipur, Jharkhand, Punjab, Chhattisgarh, Karnataka, Meghalaya, Odisha, Nagaland, Uttar Pradesh, Haryana
Negative Growth	< 0.00	22	62.86	Bihar, Tripura, West Bengal, Jammu & Kashmir, Madhya Pradesh, Rajasthan, Puducherry, Andaman & Nicobar Islands, Gujarat, Lakshadweep, Himachal Pradesh, NCT of Delhi, Chandigarh, Mizoram, Kerala, Assam, Uttarakhand, Sikkim, Dadra & Nagar Haveli, Tamil Nadu, Daman & Diu, Arunachal Pradesh
Total		35	100	

Source: Computed by authors, Data extracted from Census of India, 2001-2011.

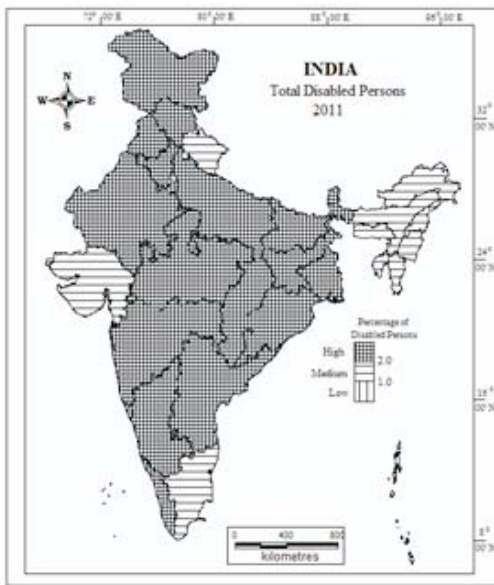


Fig. 1: Distribution of Total Disabled Persons in India, 2011

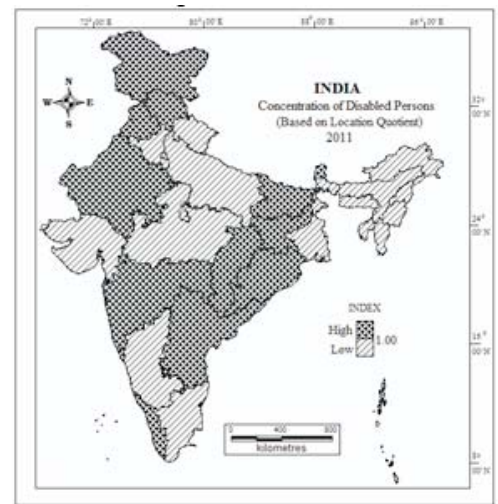


Fig. 4: Concentration of Disabled Persons in India, 2011

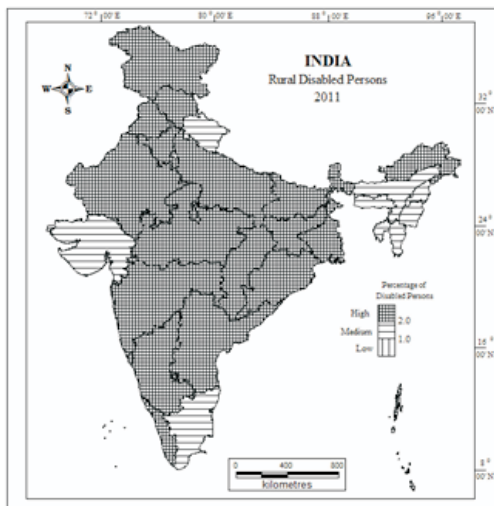


Fig. 2: Distribution of Rural Disabled Persons in India, 2011

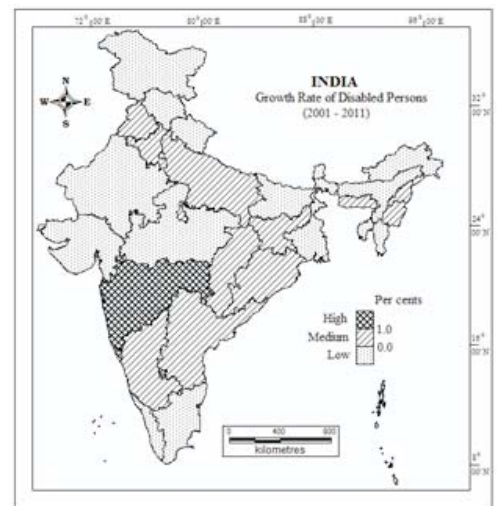


Fig. 5: Growth Rate of Disabled Persons in India, 2011

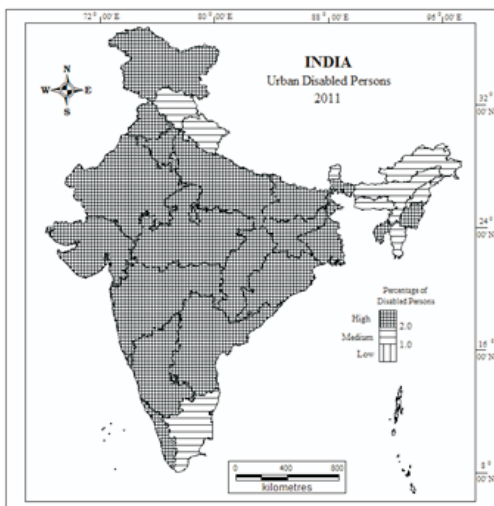


Fig. 3: Distribution of Urban Disabled Persons in India, 2011



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