Spatial Analysis of Health Amenities in TSP Area of Rajasthan

[1]Khetpal Rawal, [2]Dr. Shivani Swarnkar

[1]Research Scholar, Department of Geography, UCSSH, M.L.S. University, Udaipur
[2]Lecturer, Department of Geography, Govt. Meera Girl's College, Udaipur

ABSTRACT

Health amenities are key component of economic development. Healthy people can contribute significantly to the development and prosperity of a nation. Economic and human development in any country and any society are prerequisites for a better quality of human life. Health is the basic and primary need of people it is also a major resource for social, economic and personal development. It prepares a background for any nation to progress in socio-economic, scientific, health and other spheres. Therefore, it should not be viewed in isolation from other goals of development. The development of any region depends upon social and economic development, but such a development can't take place without simultaneous development of amenities. Health amenities development in Tribal Areas is the base of economic development of the any region. The progress of any country or society greatly depends on the quality of life of its people. Generally an amenity defines as "a set of facilities through which goods and services are provided to the public, which shows the quality of life of people in a region." Regional disparity is worldwide problem today, especially in the developing countries. Health development means overall status of health in terms of access, infrastructure and outcomes. This study considered Eleven (11) indicators for health amenities Health Development index (HDI) has been derived by using Standard Score. Levels of health development at amenities have been calculated followed by determination of composite health development index. The study concluded category in comparison to tehsil of TSP area of Rajasthan. So present study made an attempt to examine the spatial analysis in health amenities development in twenty four tehsils of TSP area of Rajasthan. In the analysis, it has been observed that some tehsils are found to be stagnant; others are either moving forward or going backward in the region. The result shows that apart from existence of wide disparity there are sufficient proof to say that there are tehsil that have done poorly placed in terms of health amenities. The paper offers some suggestions to reduce the glaring variations.

Keywords: - Composite indices, Amenities, Health, Development

INTRODUCTION

Health amenities are key component to human happiness and economic development. Healthy people can contribute significantly to the development and prosperity of a nation. Economic structure is essential the backbone of overall development process for a nation, especially on the present day circumstances when global financial crisis severely affects the economic structure hence, for the proper development practice always requires an innovative, ever growing economy which in turns requires greater innovations in the field of human capital. Economic and human development in any country and any society are prerequisites for a better quality of human life. Health is the basic and primary need of people it is also a major resource for social, economic and personal development. It prepares a background for any nation to progress in socio-economic, scientific, health and other spheres. Therefore, it should not be viewed in isolation from other goals of development. The development of any region depends upon social and economic development, but such a development can't take place without simultaneous development of amenities.

Present study is an attempt to unfold the tehsil level development of health amenities in TSP area of Rajasthan. Health amenities development in Tribal Areas is the base of economic development of the any region. The progress of any country or society greatly depends on the quality of life of its people. Generally an amenity defines as "a set of facilities through which goods and services are provided to the public, which shows the quality of life of people in a region." Regional disparity is worldwide problem today, especially in the developing countries. Health development means overall status of health in terms of access, infrastructure and outcomes.

STUDY AREA

Tribal Sub-Plan Area of Rajasthan is located in Southern Part of the State. As its neighbour along with Madhya Pradesh and Gujarat state. The Tribal Sub-Plan Area is confined within 23°02'41.09''N and 24°54'59.73''N Latitude and 72°11'28.73''E to 75°00'14.57''E Longitude. The Tribal Sub Plan Area covers an area of 21563.1 Square Kilometres with 24 tehsils in the region. The population of Tribal Sub-Plan Area according to the Census (2011) is 5934792 persons (including 3001090 Males and 2933702 females) in Area. The sex ratio of the TSP region was registered as 977 and the density of population per sq. km. was 274, which are below the national average. The literacy rate in the tribal sub plan area is 56.18 percent.
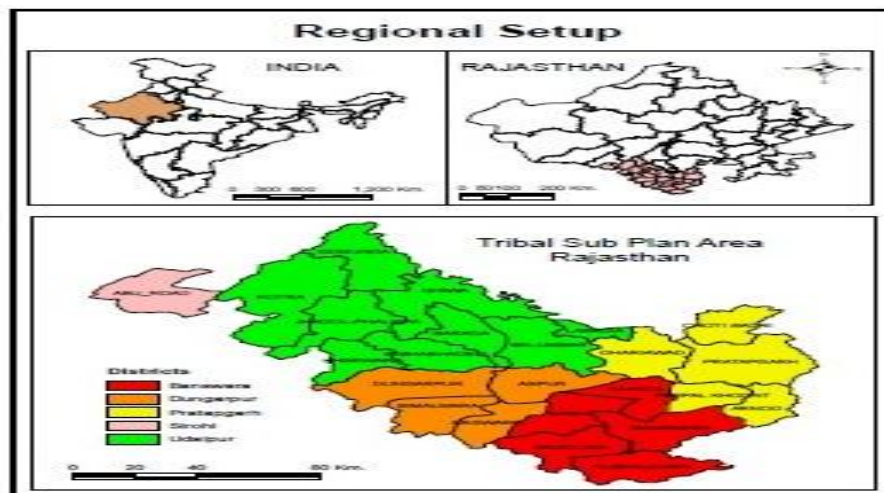

Fig. No. 1 Location Map of Study Area

OBJECTIVES:-

The present study attempts to investigate the following objectives:

❖ To find out the status of health amenities in each tehsils and identify the backward tehsil of the area.

❖ To describe Spatial variation in the health amenities of TSP area of Rajasthan

DATA BASE AND METHODOLOGY

The present study is mainly based on Secondary data obtained from census of India (2011) and Department of Health, Government of Rajasthan. This research paper aims to measure the spatial analysis in the status of health amenities in the region at tehsil level with the help of multi variables data analysing method. The presented models and methodology based on it are suitable for making spatial analysis measurable through this and with the help of statistical data,

the spatial analysis of any territorial unit of any level can be determined. It is also analysed and presented by GIS and Cartographic methods based on statistical techniques. A number of methods have been used to study. The following Eight indicators are taken to calculate to status of health amenities.

- X_1 -Number of CHC per 20000 persons
- X_2 -Number of PHC per 20000 persons
- X_3 -Number of SC per 20000 persons
- X_4 -Number of AH per 20000 persons
- X_5 -Number of Doctor per 20000 persons
- X_6 -Number of Nursing Staff per 20000 persons
- X_7 -Number of BED per 20000 persons
- X_8 - Number of CHC per 100 Square Kilometres
- X_9 - Number of PHC per 100 Square Kilometres
- X_{10} - Number of SC per 100 Square Kilometres
- X_{11}- Number of AH per 100 Square Kilometres

The above indicators are taken to calculate the indices, on the basis of each Tehsils of the TSP Area. The level of amenities have been divided are the five categories like High, Moderate High, Moderate, Low and Very Low disparities in Health amenities development.

To determine the level of development composite index method has been used. Following steps are involved to calculate the composite index.

1. First of all mean of each indicator has been identified.

    a) Arithmetic mean of indices-

$$\bar{x}=\sum\frac{x}{N}$$

    Where= $\sum x$ = sum of indices

    N= number of indices

2. Standard deviation (S) of each indicator has been calculated.

    b) Standard deviation of indices

$$\sigma = \sqrt{\sum d^2}/N$$

    Where- d=$\bar{x}$-x – deviation from actual mean

3. Standard values has been calculated by using the following formula

    c) Standard Score $Zij = (X-X) / Sj$

    Where X= Mean of the jth indicators

    Sj= STDEV of jth indicator

4. Gross values of each tehsils has been calculated by adding the standardized value of all indicators found in that tehsils

    d) G.V. = sum of total indicators

5. At the last composite index has been identified

    e) Composite index= G.V/ N

    G.V. = Gross Value

    N   = Number of Indicators

ANALYSIS AND DISCUSSION

The composite indices of development have been worked out separately for health amenities given in Table 3. The amenities have also been ranked on the basis of development. It

may be seen from the table that in case of health development the Gogunda tehsil ranked first and Kotra ranked last ranked. The development in all tehsils of the region is never uniform, whether the countries are developing or developed. Regional disparities in the level of health amenities in tribal area are varying in all tehsils of TSP area. The detailed explanation of level of disparities is given below.

Table 1. Development Indicators of health amenities in TSP area

Tehsils Name	Number of Amenities Per 20,000 Persons							Number of Amenities per 100 Sq. Kms			
	X1	**X2**	**X3**	**X4**	**X5**	**X6**	**X7**	**X8**	**X9**	**X10**	**X11**
Aburoad	0.18	0.18	10.16	1.87	1.78	10.16	14.26	0.23	0.23	12.97	2.39
Arnod	0.14	0.71	14.61	3.12	4.96	18.29	4.25	0.15	0.77	15.82	3.38
Aspur	0.27	0.80	7.76	2.85	3.57	16.68	8.03	0.42	1.27	12.25	4.51
Bagidora	0.27	0.64	5.78	1.23	2.19	9.68	8.03	0.58	1.39	12.51	2.66
Banswara	0.17	0.44	3.49	0.83	1.96	5.71	5.23	0.35	0.88	7.05	1.67
Chhoti Sadri	0.15	0.60	11.34	3.28	2.39	16.71	4.48	0.14	0.55	10.54	3.05
Dhariyawad	0.21	0.74	14.33	3.05	3.27	19.59	6.32	0.22	0.76	14.74	3.14
Dungarpur	0.16	0.97	3.39	1.90	2.79	7.43	4.84	0.30	1.82	6.37	3.56
Garhi	0.40	0.54	6.03	1.54	2.68	10.58	12.05	0.82	1.10	12.36	3.16
Ghatol	0.21	0.77	2.02	0.63	1.39	5.43	6.27	0.39	1.43	3.76	1.17
Girwa	0.30	1.41	4.44	0.71	2.72	8.57	9.07	0.30	1.40	4.40	0.70
Gogunda	0.72	2.16	15.85	2.88	7.20	26.65	21.61	0.99	2.96	21.69	3.94
Jhadol(PH)	0.24	0.48	4.73	1.36	2.89	9.55	7.22	0.21	0.42	4.13	1.19
Kherwara	0.10	1.06	2.42	0.77	2.51	7.06	2.90	0.16	1.73	3.92	1.25
Kotra	0.17	0.52	2.95	1.13	1.74	5.73	5.21	0.12	0.35	1.96	0.75
Kushalgarh	0.21	0.21	4.06	1.21	1.79	8.17	6.33	0.39	0.39	7.52	2.24
Lasadiya	0.22	0.44	10.08	1.75	2.85	21.05	6.58	0.18	0.37	8.40	1.46
Peepalkhoont	0.26	0.52	7.01	2.21	2.60	15.06	7.79	0.24	0.48	6.46	2.03
Pratapgarh	0.16	0.72	4.42	0.40	1.69	10.29	4.82	0.15	0.68	4.17	0.38
Rishabhdeo	0.23	0.58	7.40	0.93	2.78	9.02	6.94	0.30	0.75	9.54	1.19
Sagwara	0.17	0.58	1.22	0.23	1.17	4.43	5.24	0.34	1.14	2.39	0.46
Salumber	0.16	0.97	5.48	1.61	3.30	8.94	4.83	0.20	1.22	6.92	2.04
Sarada	0.35	0.78	6.49	0.61	3.37	11.25	10.38	0.43	0.97	8.09	0.76
Simalwara	0.25	0.68	4.61	1.60	1.90	7.92	7.37	0.46	1.27	8.69	3.01
Min	0.10	0.18	1.22	0.23	1.17	4.43	2.90	0.12	0.23	1.96	0.38
Max	0.72	2.16	15.85	3.28	7.20	26.65	21.61	0.99	2.96	21.69	4.51
Mean	0.26	0.79	6.35	1.51	2.80	11.52	7.75	0.37	1.10	8.40	2.05
STDEV	0.16	0.50	4.27	0.92	1.51	6.42	4.77	0.25	0.73	5.34	1.20

1. LEVELS OF DEVELOPMENT IN THE HEALTH AMENITIES

Health disparities have many causes ranging from poor infrastructure to present status of number of health amenities in different categories and various other factors which are social, economical and political. Based on 11 indicators the levels of health development have been calculated. The composite index of all selected indicators of Health amenities in the TSP area is calculated the number of CHC centres, PHC Centres, SC, AH centres, Doctor, Nursing staff and BED per 20000 persons and per 100 sq. Kms are the important health indicators considered and computed by composite index formula show in table 3. It is observed that the health indicators value from below -0.80 to above +2.42 Fig. 2 show.

Table. 2: Composite development index of health amenities in TSP area

Tehsils Name	Number of Amenities Per 20,000 Persons							Number of Amenities per 100 Sq. Kms				G.Value	C.I.Value	Rank
	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11			
Aburoad	-0.50	-1.23	0.89	0.39	-0.67	-0.21	1.37	-0.56	-1.21	0.86	0.28	-0.59	-0.05	11
Arnod	-0.73	-0.16	1.94	1.74	1.44	1.05	-0.73	-0.85	-0.46	1.39	1.11	5.72	0.52	3
Aspur	0.06	0.03	0.33	1.46	0.51	0.80	0.06	0.22	0.22	0.72	2.05	6.46	0.59	2
Bagidora	0.06	-0.29	-0.13	-0.30	-0.40	-0.29	0.06	0.85	0.39	0.77	0.51	1.22	0.11	7
Banswara	-0.53	-0.71	-0.67	-0.74	-0.55	-0.90	-0.53	-0.06	-0.31	-0.25	-0.31	-5.56	-0.51	19
Chhoti Sadri	-0.69	-0.39	1.17	1.92	-0.27	0.81	-0.69	-0.91	-0.76	0.40	0.83	1.43	0.13	6
Dhariyawad	-0.30	-0.10	1.87	1.67	0.31	1.26	-0.30	-0.60	-0.48	1.19	0.91	5.43	0.49	4
Dungarpur	-0.61	0.36	-0.69	0.42	-0.01	-0.64	-0.61	-0.25	0.99	-0.38	1.26	-0.16	-0.01	8
Garhi	0.90	-0.51	-0.08	0.03	-0.08	0.15	0.90	1.83	-0.01	0.74	0.92	4.51	0.41	5
Ghatol	-0.31	-0.05	1.01	0.96	-0.93	0.95	-0.31	0.09	0.44	-0.87	-0.74	-5.58	-0.51	21

												C.I. Value	G. Value	Rank
Girwa	0.28	1.25	-0.45	-0.87	-0.05	0.46	0.28	0.27	0.41	-0.75	-1.13	-1.76	-0.16	14
Gogunda	2.91	2.75	2.23	1.49	2.92	2.35	2.91	2.47	2.55	2.49	1.58	26.64	2.42	1
Jhadol(PH)	-0.11	-0.62	-0.38	-0.16	-0.06	-0.31	-0.11	-0.63	-0.94	-0.80	-0.72	-4.71	-0.43	18
Kherwara	-1.02	-0.55	-0.92	-0.80	-0.19	-0.69	-1.02	-0.84	-0.86	-0.84	-0.66	-5.57	-0.51	20
Kotra	-0.53	-0.54	-0.80	-0.41	-0.70	-0.90	-0.53	-1.00	-1.04	-1.21	-1.09	-8.76	-0.80	24
Kushalgarh	-0.30	-1.16	-0.54	-0.32	-0.66	-0.52	-0.30	-0.10	-0.98	-0.16	-0.16	-4.69	-0.43	17
Lasadiya	-0.25	-0.70	0.88	0.26	0.04	1.48	-0.25	0.73	1.02	0.00	-0.49	-0.78	-0.07	12
Peepalkhoont	0.01	-0.54	0.16	0.76	0.13	0.55	0.01	-0.51	-0.86	-0.36	-0.01	-0.94	-0.09	13
Pratapgarh	-0.61	-0.13	-0.45	-1.20	-0.73	-0.19	-0.61	-0.86	-0.58	-0.79	-1.39	-7.56	-0.69	22
Rishabhdeo	-0.17	-0.42	0.25	-0.63	-0.01	0.39	-0.17	0.27	0.49	0.22	-0.71	-2.82	-0.26	16
Sagwara	-0.53	-0.41	-1.20	-1.38	-1.08	-1.10	-0.53	-0.10	0.05	1.12	1.33	-8.74	-0.79	23
Salumber	-0.61	-0.36	-0.20	-0.11	0.33	-0.40	-0.61	-0.65	0.16	-0.28	-0.01	-1.81	-0.16	15
Sarada	0.55	-0.02	0.03	-0.98	0.38	-0.04	0.55	0.26	-0.18	-0.06	-1.08	-0.58	-0.05	10
Simalwara	-0.08	-0.23	-0.41	0.09	-0.59	-0.56	-0.08	0.39	0.23	0.05	0.80	-0.38	-0.03	9

Source: Department of Education and Calculate By the Authors
C.I. Value: Composite Index Value, G. Value- Gross Value

Table. 3: The levels of development of Health Amenities in TSP Area

Sr. No.	Category	CDI Value	Tehsils	Number of tehsils
1.	High Level	>+0.59	Gogunda	1
2.	Moderate High Level	+.59 to +.49	Aspur, Arnod, Dhariawad	3
3.	Moderate Level	+.49 to -0.16	Garhi, Chhoti Sadri, Bagidora, Dungarpur, Simalwara, Sarada, Aburoad, Lasadiya, Peepalkhoont	9
4.	Low Level	-0.16 to -0.69	Girwa, Salumber, Rishabhdeo, Kushalgarh, Jhadol, Banswara, Kherwara, Ghatol, Pratapgarh	9
5.	Very Low Level	<-0.80	Sagwara, Kotra	2

Source: Calculate By the Authors

High Level: - The High level amenities consist of 1 tehsil namely Gogunda (C.I.V. +2.42 and rank 1) respectively with having a range from > +0.59. This tehsil have high level health amenities in all indicators and better conditions of education amenities.

Moderate High Level: - The moderate high level health amenities consist of 3 tehsil namely Aspur (+.59 and rank 2), Arnod (C.I.V. +.52 and rank 3) and Dhariawad (C.I.V. +.49 and rank 4) respectively with having a range from +.59 to +.49. These tehsil have moderate high level health amenities in all indicators and good conditions for health institutions.

Moderate level :- The moderate level health amenities consist of 9 tehsil namely Garhi (C.I.V. +.41 and rank 5), Chhoti Sadri (C.I.V. +.13 and rank 6), Bagidora (C.I.V. +.11 and rank 7), Dungarpur (C.I.V. -.01 and rank 8), Simalwara (C.I.V. -.03 and rank 9), Sarada (C.I.V. -.05 and rank 10), Aburoad (C.I.V. -.05 and rank 11), Lasadiya (C.I.V. -.07 and rank 12) and Peepalkhoont (C.I.V. -.09 and rank 13) respectively with having a range from +0.49 to -0.1. These tehsil have moderate level health amenities in all indicators and average conditions of institutions in all categories.

Low Level :- The low level consist of 9 tehsils of the area in the health scenario Girwa (C.I.V. -.16 and rank 14), Salumber (C.I.V. -.16 and rank 15), Rishabhdeo (C.I.V. -.26 and rank 16), Kushalgarh (C.I.V. -.43 and rank 17), Jhadol(PH) (C.I.V. -.43 and rank 18), Banswara (C.I.V. -.51 and rank 19), Kherwara (C.I.V. -.51 and rank 20), Ghatol (C.I.V. -.51 and rank 21) and Pratapgarh (C.I.V. -.69 and rank 22), respectively having a range from -0.16 to -.69. These tehsils have low level amenities in all indicators.

Very Low Level: - The very low level health amenities are found in 2 tehsils namely Sagwara (C.I.V. -.79 and rank 23) and Kotra (C.I.V. -.80 and rank 24) respectively having a range < -.80. This is due to the reason that all these tehsils have poor condition of institutions in all categories.
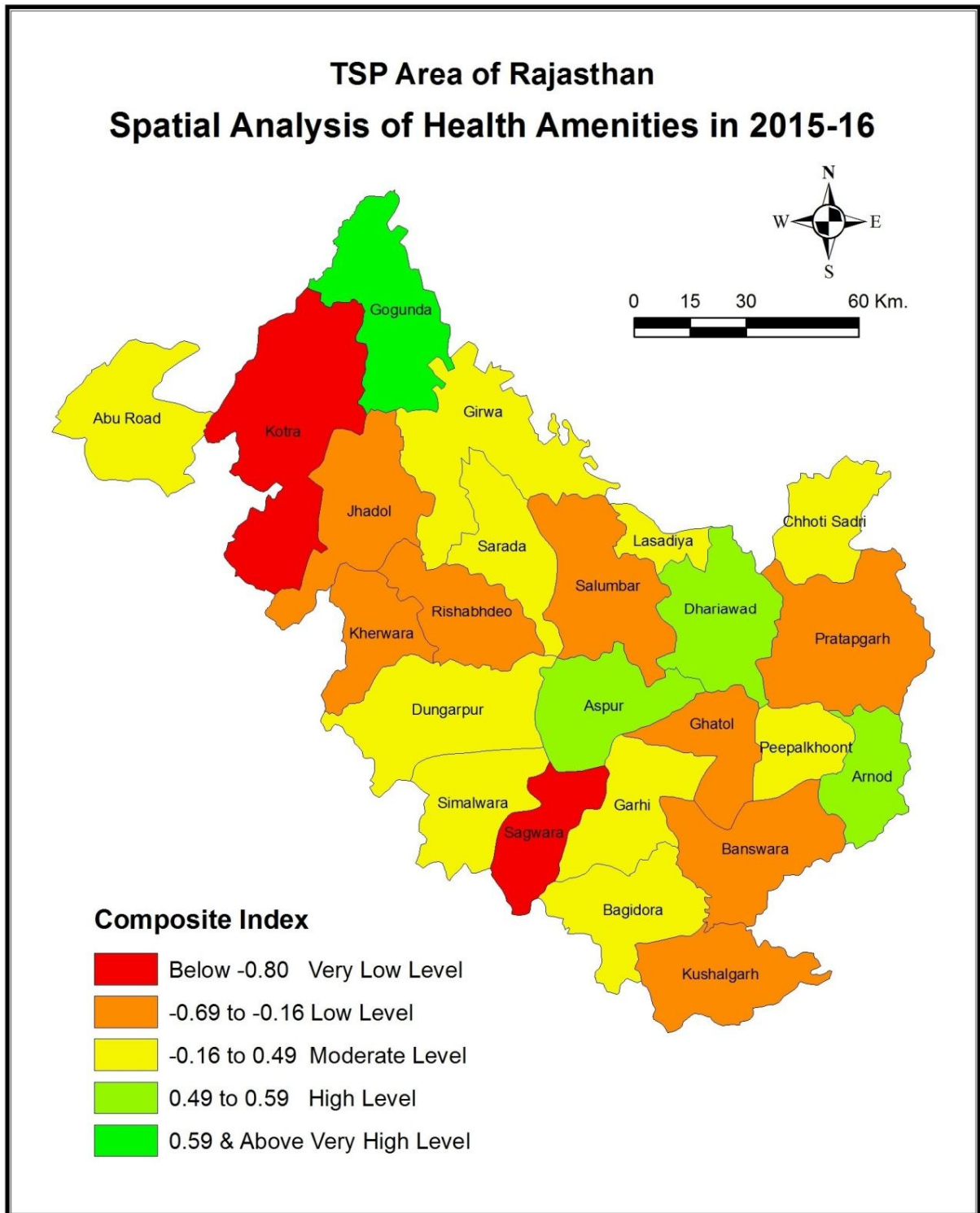
Fig. No. 2 Spatial Analysis of Health Amenities

CONCLUSION AND SUGGESTION

The broad conclusions emerging from the study are as follow wide disparities in the level of development have been observed between different states of the southern region. Tribal Sub Plan area does not have good condition for health amenities. In health development the Gogunda tehsil is found to be better developing at very high level where as Pratapgarh, Sagwara and Kotra tehsils have very low level development. It may be concluded that the TSP region has very high regional disparities and backwardness in the levels of health amenities. Government should not only focus on very low and low level amenities but also focus on equivalent development of all these tehsils. Therefore all tehsils with High level and moderate high level in the TSP area should be given first priority so that they may come to the level of low disparities area and the concepts of planning with sustainable development may be fulfilled. Therefore the tehsil with low levels of development should be given top priority so that they may come to the level of developed area. The concept of planning with social justice sustainable development may be fulfilled.

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