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Research Article

A Comprehensive Evaluation of Basic Health Facilities according to Local Standards and Demographic Features of Umarkot Sub-region, Pakistan

[1]Mir Aftab Hussain Talpur, [1]Madzlan Napiah, [1]Imtiaz Ahmed Chandio and [2]Taufiq Ahmed Qureshi
[1]Department of Civil Engineering, Universiti Teknologi PETRONAS, Malaysia
[2]Department of City and Regional Planning, Mehran University of Engineering and Technology, Jamshoro, Sindh, Pakistan

Abstract: The population of developing countries is increasing with its pace, which put a negative impact on the availability of services, especially accessible health facilities in destitute sub-regions. The shortage of basic health institutions created havoc in deprived sub-regions, which shattered the health structure of common men. There could be many reasons behind, but the most prominent could be the unavailability of health institutions, according to local standards and sub-regional demographic characteristics. Therefore, the goal of this research is to investigate the health and population features of the study area and to determine the existing and futuristic shortage of basic health institutions, according to local standards of the country. To comply with study objectives, the data were collected through field visits, interviews with the officials and with the help of available documents, i.e., district census report. The aims of the study were achieved and it was found that the health sector of the study area was not in its satisfactory condition. The findings of this study may provide a vision to the policy makers in a sense that they could pay their attention to the shaky condition of the health sector, especially in backward sub-regions of the country.

Keywords: Basic health institutions shortage, destitute regions, health sector, local standards, population

INTRODUCTION

The development agencies of backward regions usually struggled to provide services and facilities to their residents at their door steps in most of the developing countries. Rural communities couldn't be able to avail affordable and accessible health facilities, due to scarcity of proper health institutions and unavailability transport services and facilities (Hyder *et al*., 2006; Talpur *et al*., 2013). The shortage of rural health facilities, according to demographic characteristics is one of the reasons behind inaccessible rural health services and facilities (Hayman, 2010), which put an adverse effect on the cost of medicines and their availability (Leisinger *et al*., 2012). In developing countries, the higher growth rate of population (Smailes *et al*., 2002) suppressed the availability of resources and facilities, which basically stimulated sub-regional socioeconomic problems (Terluin, 2003) and intended to build the ground for the physical and environmental issues as well. In such situations, urbanization is inevitable as most of the developing countries are expecting the higher proportion of the urbanization process (Firdaus and Ahmad, 2011). Rural people in search of better lives, migrate towards the urban settlements, where services are easily available (Arif and Hamid, 2009).

Urbanization is a decent phenomenon in the development of retrograde societies, as far as this would be restrained to its boundaries. The higher proportion of urbanization generated congestion in the urban settlements as most the cities of the developing countries are experiencing congestion and haphazard growth (Srinivasan, 2005; Haider and Haider, 2006; Yeung, 2011; Naeem, 2011). The cities become stagnant because of the influx of people and often concerned authorities unable to manage planning and development works. Deprived regions become depressed in a result as most of its skilled population migrated towards urban centers. Whilst, the deprived regions would trap in a vicious circle in this way together with the prevailing depressed environment, migrating people (Robson and Nayak, 2010) and unemployment (Schanne *et al*., 2010). This is the situation, where rural health services troubles would not be resolved at the priority level and rural residents get suffered from their ills without remedial measures. Because, all the intentions and policy measures, then focused the burning issues of the urban settlements rather provision of basic socioeconomic facilities in destitute regions of developing countries, including affordable health services. With the passage of time, the distances between the rural communities and sub regional health facilities would enhance (Karim *et al*.,

Corresponding Author: Mir Aftab Hussain Talpur, Department of Civil Engineering, Universiti Teknologi PETRONAS, Malaysia

2006), which also lowered down the rural health standards (Bentham and Haynes, 1985; Bronstein and Morrissey, 1990). Meanwhile, the provision of health services according to sub-regional population would become intricate and would give birth to the burning issue of rural sub-regional health inaccessibility (Arcury *et al*., 2005).

In Pakistan, health facilities are provided according to the hierarchy of settlements as hospitals are available in the District and Taluka headquarters. Rural Health Centers (RHCs) have given the responsibility to cure the sickness of the rural population, while the Basic Health Units (BHUs) and dispensaries have a liability to facilitate small towns and villages respectively. These all are communal sector health institutions, which are dependable for the provision of low cost health services to scattered regions and urban settlements. Nevertheless, the health sector of the country is not in an admiring state and facing a discrepancy in the supply of medicines and health institutions (Islam, 2002). It was observed that government sector health institutions experienced difficulties over the years (Nishtar, 2006). There could be many reasons behind, like: shortages of financial assistance, medicines, medical staff and lack of health institutions (Akram and Khan, 2007). As far as this study is concerned, this only focused to determine the shortages of public sector health institutions with respect to the sub-regional demographic characteristics of the study area. The deficiency was computed for RHCs, BHUs and dispensaries, conferring to Sub-regional demography and local standards. Hence, the motive of this article is to trap the issues of health inaccessibility and unavailability, in the context of rural regions of the developing countries. The demographic features and the number of available health facilities were studied and health institution's demand was calculated with the help of available national standards. Some statistical tests were also performed in order to validate the whole process. At the same time, the sub-regional health maps of the study area were also designed, which show the existing and futuristic sub-regional health institution's requirement of the study area. Therefore, the aim of the study is to compute the shortage of health facilities, according to the sub-regional population statistics of the study area. This study is a substantial in a sense that on the one hand, it bequeaths the whole clear cut picture of the demographic features and health system of the study area. On the other hand, this study could be set as an example for the destitute sub-regions to tackle health problems, which shattered the whole system of the developing nations.

MATERIALS AND METHODS

Study area: The study area is Umarkot, a desolate sub-region emplaces in southern parts of Pakistan (Fig. 1), where health sector is not in its satisfactory condition (Karim and Zaidi, 1999). Pakistan is a crowded country of almost 200 Million people (Khan, 2012) with higher household sizes and ranked 5th in the world (Anwar *et al*., 2012).

Fig. 1: Location map of Umarkot sub-region (Mehdi *et al*., 2009)

The sub-region of Umarkot is positioned at (24° 54′ to 25° 47′) north latitude and (69° 11′ to 70° 18′) east longitude. According to District Census Report (1998), the total area of the sub-region is 5608 km^2. As shown in the Fig. 1, the sub-region of Sanghar and Mirprkhas are in the west of Umarkot. Umarkot sub-region has its border with India in the northeast, while Tharparker sub-region exists in its southeastern side. With reference to a District Census Report (1998), the average household size in the sub-region was about 5.4. This size was higher in towns of the sub-region, i.e., 6.2, whereas in rural areas, the same was noted as 5.2 persons per house. From the total, almost 84% of the population of the Umarkot lived in rural areas, while the remaining considered as urban. The rural population was about 551.6 thousand and the urban was 111.46 thousand, together with the annual growth rate of 3.91%.

Methods: The data can be collected by the means of a variety of methods (Talpur *et al*., 2012; Tre'panier *et al*., 2008); but in this research, the data were collected through field surveys and by referring authentic official documents. The sub-regional population statistics were collected from the district census report and projected up to the year 2035 by utilizing the compound interest formula for the population projection (Roberts, 1974). Mathematical expression is given as follows:

$$P_t = P_0 (1 + r)^n \quad (1)$$

where,
Pt = Projected population
P_0 = Current population
r = Annual growth rate/100
n = No. of Years

After getting results, the same were validated by applying various descriptive tests, including "One-Sample Kolmogorov-Smirnov Test (KS Test)" (Goldman *et al*., 2008) and correlation (Düzel *et al*., 2013) using (SPSS-17.0). The health maps were also designed with the help of (AutoCAD-2000), to show the public sector health facilities for the years 2012 and 2035, respectively.

RESULTS AND DISCUSSION

The Union Council (UC) wise population was projected for all four Talukas of the sub-region, which can be seen in Table 1 to 4 consecutively. UC is a smaller administrative unit after Taluka. A town can have many UCs and expanded over suburban villages, depending on its area and population (Devolution in Pakistan: Reform or Regression? 2004). There are many UCs that can be existed in Taluka together with towns and villages. The Taluka is a second administrative unit after District or County (Winkler and Hatfield, 2002). There are (04) Talukas and (23) UCs existed in the study area; the names of the Talukas are Umarkot, Pitharo, Kunri and Samaro.

In order to corroborate the sub-regional demographic data; Table 5 was prepared, which shows the Taluka wise population of the Umarkot sub-region. To check the normality and the significant relationship between the population of the year 2012 and 2035; KS

Table 1: Union council wise population of Taluka Umarkot (annual growth rate = 2.38)

Name of U/C	Current population 2012	Estimated population 2035
Umarkot I	35,717	64,292
Umarkot II	33,159	59,686
K.S. Ata M. Palli	35,589	64,060
Mir Wali. M. Talpur	34,386	61,895
Khejrari	32,271	58,088
Faqir Abdullah	30,051	54,090
Khararo Syed	36,089	64,960
Sabho	36,648	65,966
Dhoronaro	35,434	63,782
Chhore	35,017	63,031
Kalpore	35,372	63,669
Khokrapar	32,327	58,187
Total	412,060	741,706

Table 2: Union council wise population of Taluka Pithoro (annual growth rate = 3.28)

Name of U/C	Current population 2012	Estimated population 2035
Pithoro	38,980	87,340
Shadi Palli	38,813	86,920
Shah Mardan Shah	39,253	87,923
Total	117,046	262,183

Table 3: Union council wise population of Taluka Kunri (annual growth rate = 2.64)

Name of U/C	Current population 2012	Estimated population 2035
Kunri	105,995	202,450
Nabisar	52,036	99,388
Char	57,140	109,138
Total	215,171	410,976

Table 4: Union council wise population of Taluka Samaro (annual growth rate = 3.28)

Name of U/C	Current population 2012	Estimated population 2035
Samaro	33,775	75,656
Samara Road	33,239	74,456
Padhiryo Farm	34,218	76,648
Araro Bhurgari	30,933	69,289
Satiryon Farm	33,727	75,549
Total	165,892	371,598

Table 5: Current and projected Taluka wise sub regional population

Name of Taluka	Current population 2012	Estimated population 2035	Annual growth rate
Umarkot	412,060	741,706	2.38
Kunri	215,171	410,976	2.64
Samaro	165,892	371,598	3.28
Pithoro	117,046	262,183	3.28
Total	910,169	1,786,463	-

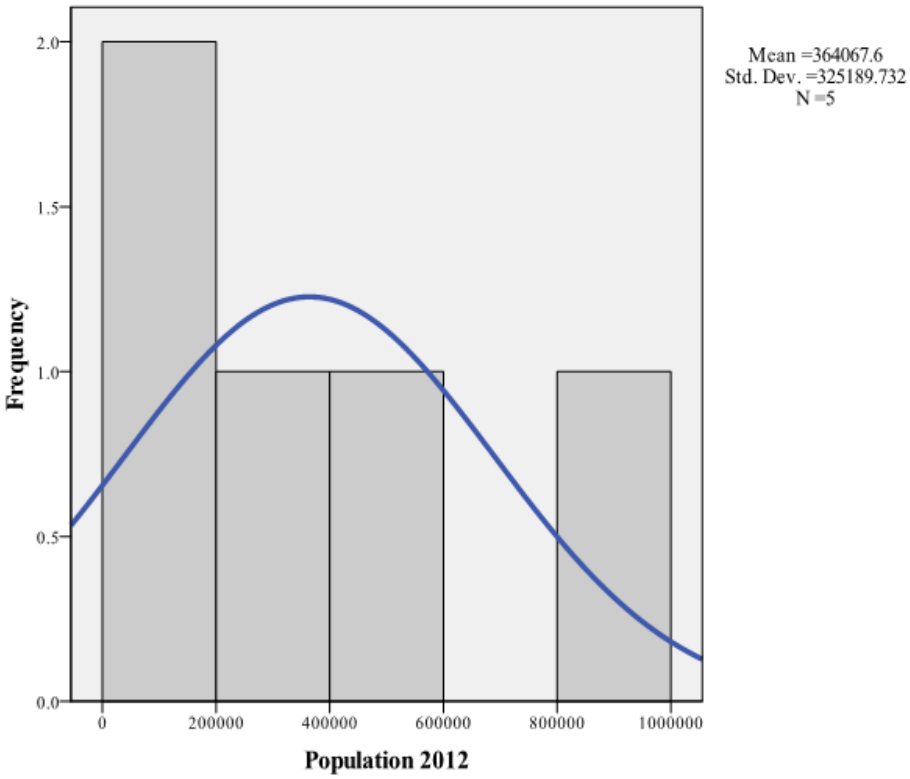

Fig. 2: Histogram with normal curve (population 2012)

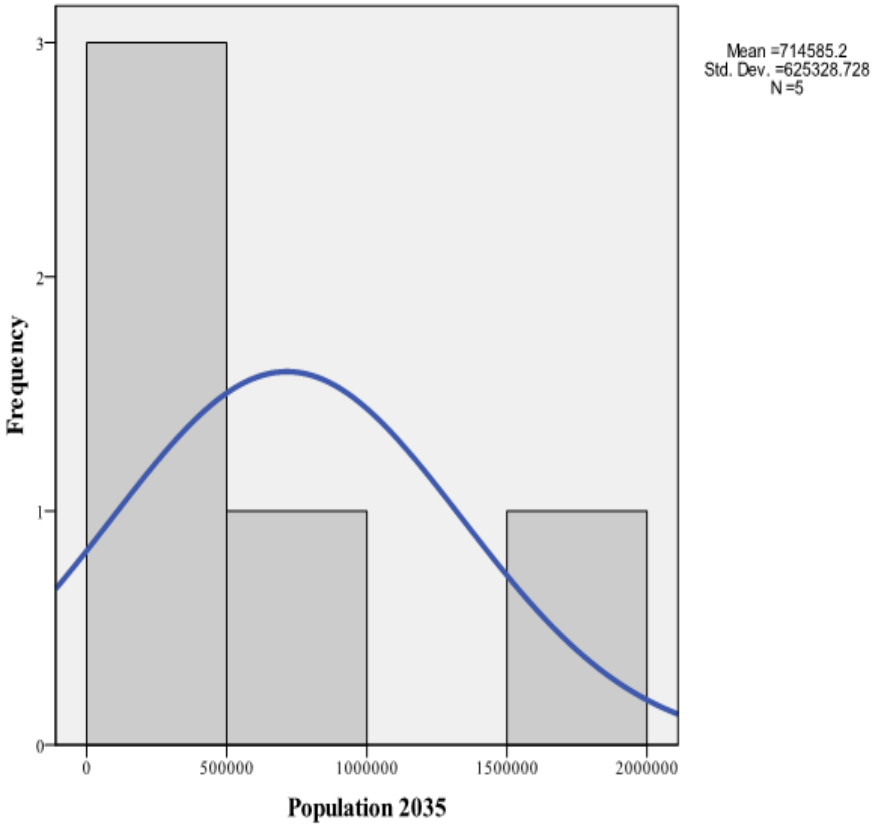

Fig. 3: Histogram with normal curve (population 2035)

Table 6: Descriptive tests results

SPSS analysis	Population 2012	Population 2035
Mean	364067.600	714585.200
Median	215171.000	410976.000
Mode	117046[a]	262183[a]
Std. deviation	325189.732	625328.728
Variance	1.057E11	3.910E11
Skewness	1.658	1.824
Std. error of Skewness	0.913	0.913
Kurtosis	2.586	3.316
Std. error of Kurtosis	2.000	2.000
Range	793123	1524280
Minimum	117046	262183
Maximum	910169	1786463

[a]: Multiple modes exist; The smallest value is shown

Table 7: One sampled KS test

		Population 2012	Population 2035
N		5	5
Normal parameters[a,b]	Mean	364067.600	714585.200
	Std. deviation	325189.732	625328.728
Most extreme differences	Absolute	0.276	0.286
	Positive	0.276	0.286
	Negative	-0.224	-0.235
Kolmogorov-Smirnov Z		0.618	0.640
Asymp. sig. (2-tailed)		0.839	0.807

[a]: Test distribution is normal; [b]: Calculated from data

Table 8: Correlation analysis

Correlation		Population 2012	Population 2035
Population 2012	Pearson correlation	1	0.998**
	Sig. (2-tailed)		0.000
	N	5	5
Population 2035	Pearson correlation	0.998**	1
	Sig. (2-tailed)	0.000	
	N	5	5

and correlation tests were performed on demographic data of the sub-region (Table 5).

For this purpose, step by step process was followed. At the beginning, various descriptive tests were carried out (Table 6). The data's outlooks can be seen from the results, which represented the analytical view of the sub-regional population for the years 2012 and 2035.

To check the normality of the data set, histograms with normal curve were determined using (SPSS-17.0) and the results can be shown in the Fig. 2 and 3, respectively. The curves do not look like perfect bell shape curves as these are a bit left skewed, which are the outcome of the positive values of the Skewness. This is acceptable in many cases, because Skewness is a bit over the normal range, while the values of Kurtosis look normal (Fig. 2 and 3).

Although, the ranges in Table 6 and the behavior of the curves as shown in Fig. 2 and 3, demonstrates the normality of the data; but again for further confirmation, the KS test was conducted for the evaluation of the normality assumption (Table 7).

The mean values of the data set are determined as 364067.60 for the year 2012 and 714585.20 for the year 2035. If ($p>0.05$) then, it can be assumed that the analysis of distribution is normal. Since, (p) values are (0.839) and (0.807) for the years 2012 and 2035, which assured that the population of the year 2012 and 2035 are normally distributed. These values give pledges to move forward to perform a correlation test to check the relationship between these two population features (Table 8).

With reference to Table 8, it is proved that the sub-regional population features are highly correlated as strong positive correlation can be seen in the Table 8. Therefore, this is validated that the population of the year 2035 is accurately determined with respect to its base year 2012.

Thus, now it is worthwhile to determine the shortage of sub-regional health institutions, according to the national standards of the country. Table 9 to12 are prepared to portray the Taluka wise backlog of public sector health institutions.

By analyzing the Table 9 to 12, this is added that the public sector health facilities are not adequate-enough as compared to the sub-regional demographic features. Population growth is ticking on and so the

Table 9: Union council wise health facilities requirement (Taluka Umarkot)

	RHCs		BHUs		Dispensaries	
UC name	Existing 2012	Estimated 2035	Existing 2012	Estimated 2035	Existing 2012	Estimated 2035
Umarkot I	01	01	01	06	02	21
Umarkot II	01	01	01	06	03	20
K.S. Ata M. Palli	00	01	01	06	02	21
Mir Wali. M. Talpur	01	01	00	06	03	21
Khejrari	00	01	01	06	02	19
Faqir Abdullah	00	01	01	05	02	18
Khararo Syed	00	01	01	06	02	21
Sabho	00	01	01	07	03	22
Dhoronaro	01	01	01	06	02	21
Chhore	01	01	00	06	02	21
Kalpore	00	01	01	06	03	21
Khokrapar	00	01	01	06	02	19
Total	05	12	10	72	28	245

Table 10: Union council wise health facilities (Taluka Kunri)

	RHCs		BHUs		Dispensaries	
UC name	Existing 2012	Estimated 2035	Existing 2012	Estimated 2035	Existing 2012	Estimated 2035
Kunri	00	04	02	20	03	67
Nabisar	00	02	04	10	02	33
Char	01	02	02	11	03	36
Total	01	08	08	41	08	136

Table 11: Union council wise health facilities (Taluka Samaro)

	RHCs		BHUs		Dispensaries	
UC name	Existing 2012	Estimated 2035	Existing 2012	Estimated 2035	Existing 2012	Estimated 2035
Samaro	07	01	01	07	00	25
Samara road	05	01	02	07	00	24
Padhiryo farm	04	01	03	07	00	25
Araro Bhurgari	06	01	01	07	00	23
satiryon farm	04	01	02	07	00	25
Total	26	05	09	35	00	122

Table 12: Union council wise health facilities (Taluka Pithoro)

	RHCs		BHUs		Dispensaries	
UC name	Existing 2012	Estimated 2035	Existing 2012	Estimated 2035	Existing 2012	Estimated 2035
Pithoro	00	02	02	09	07	29
Shadi Palli	00	02	03	09	05	29
Shah Mardan Shah	00	02	02	09	06	29
Total	00	06	07	27	18	87

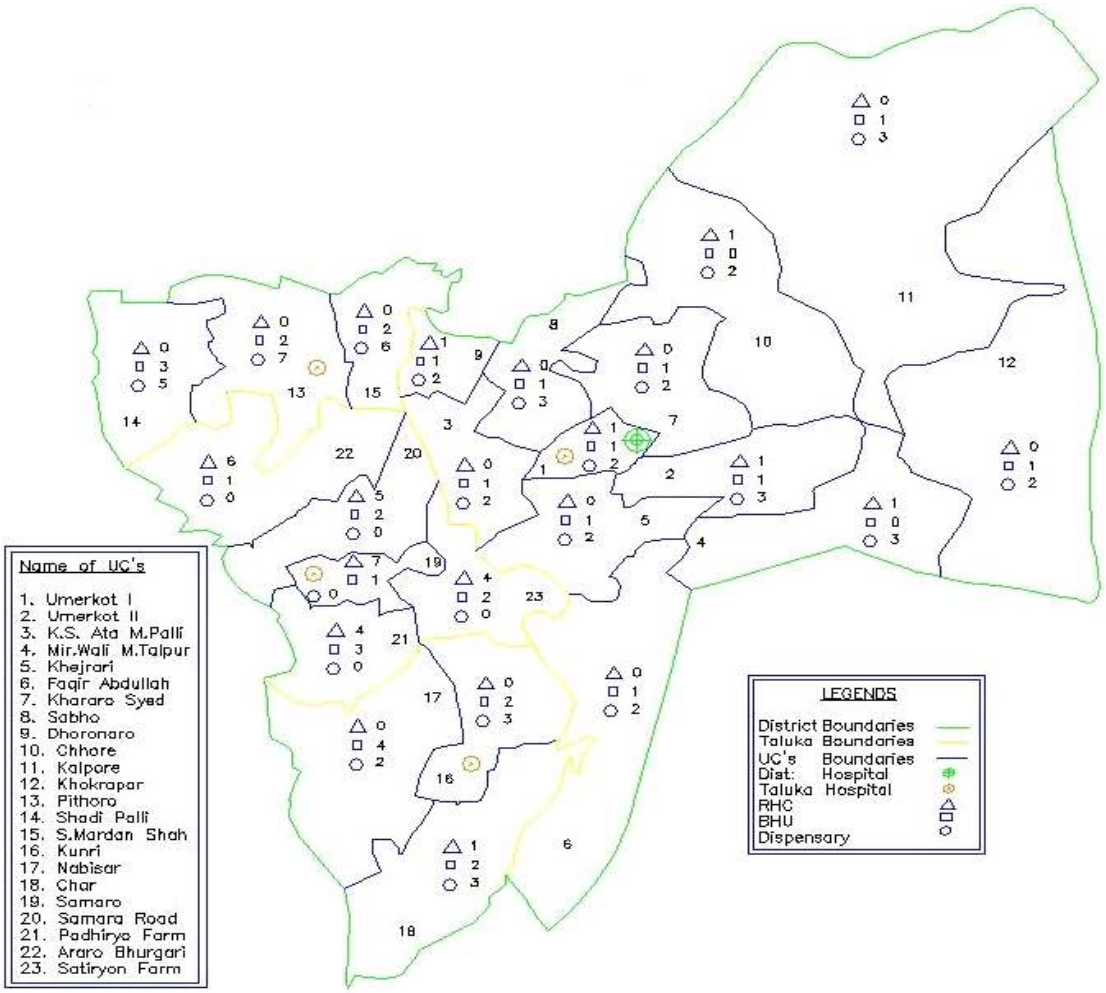

Fig. 4: UC wise health facilities (Umarkot Sub-region, 2012)

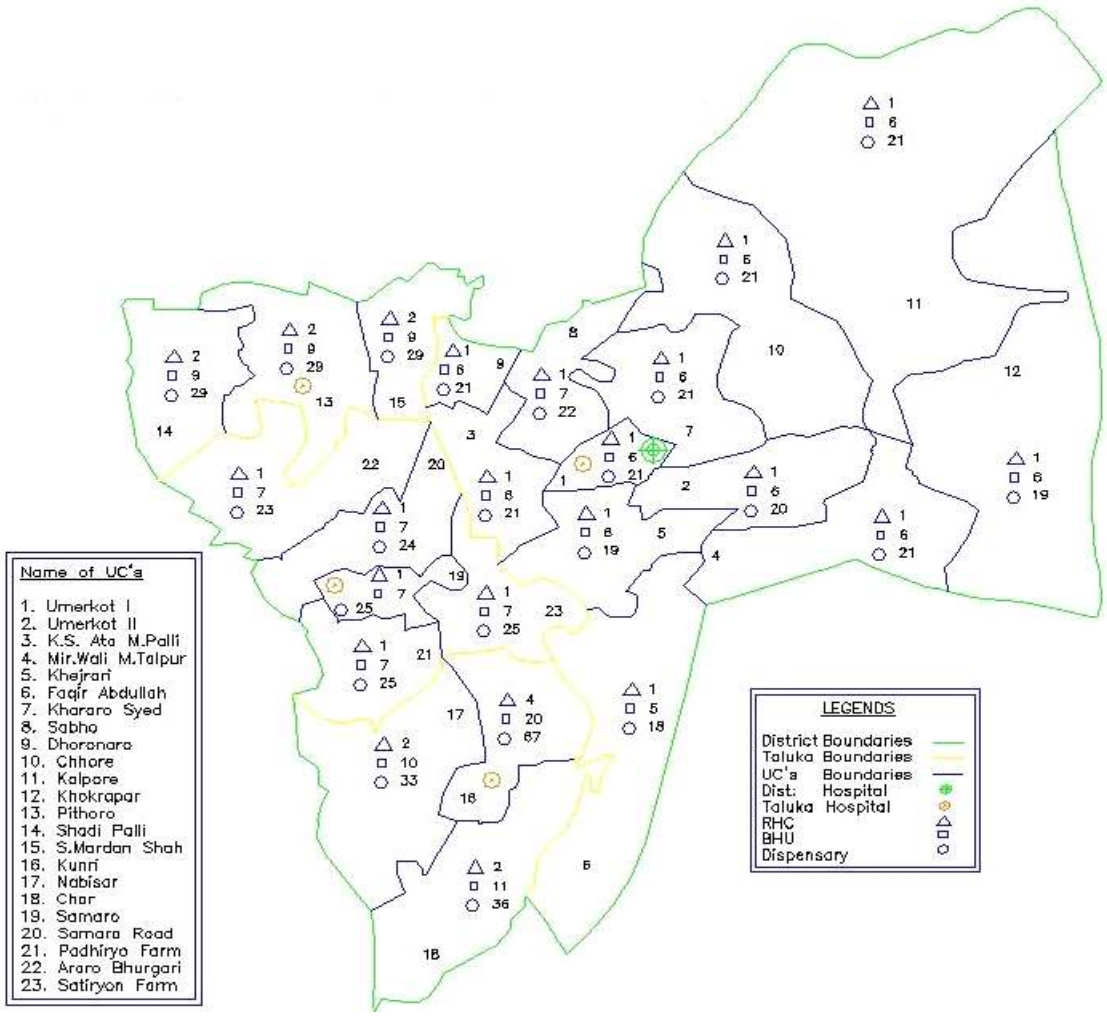

Fig. 5: UC wise health facilities (Umarkot Sub-region, 2035)

burden on the available resources, including sub-regional health availabilities.

The public sector health availabilities in the year 2012 and backlog up to the year 2035 are represented graphically in the Fig. 4 and 5. These health maps actually show the locations of existing and projected shortages of public sector health institutions in the study area. Consequently, this would be quite favorable for the policy makers to obtain the relevant information from these maps and understand the actual ground realities of the sub-regional health sector of the study area (Fig. 4 and 5).

CONCLUSION

This research can be beneficial in uplifting the health standards of common men. The public sector health institutions in the study area are not sufficient, when compared to the standards. More institutions would be required in this context up till the year 2035. Because, this is a suitable way to provide low cost health services to rural dwellers at affordable cost. The health accessibility can also be enhanced by the availability of standard sub-regional health services, according to population. Therefore, this paper would provide a road map for policy makers to formulate health policies focusing the health problems of the rural population of the study area.

The objective of the study was completed successfully and the shortage of health institutions was determined, which would show the way to the country's policy makers to tackle the problems of the health sector. Timely policies should be devised accordingly in order to keep the development process ticking. Meanwhile, relevant policies should be formulated, which could assist in bringing the medical staff to these aloof rural regions of the developing countries. The funds should be allocated for the availability of medical apparatus in the District and Taluka hospitals, together with RHCs, BHUs and dispensaries. At the same time as, the rural population of the study area may take benefit from the health services, which could further

strengthen the sub-regional health profile of the study area. Hereafter, the sub-regional health standards can be upgraded, which could be monitored with the timely implementation of sub-regional health policies. This research article is a step further in the up-gradation of the sub-regional health sectors of the developing countries. Particularly, this study can put positive health impacts in the study area and can play its role in maintaining the health standards of the rural inhabitants.

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