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Physical Infrastructure Facilities in Surveyed Slums in Kota City, District Kota, Rajasthan

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ABSTRACT

Human populations have tended to increase over a span of time. Since ancient times, people have been living in groups. Different civilizations developed living space and infrastructure in different ways to improve their standard of living. Traces of cities are found in ancient civilizations such as Mesopotamia and Mohenjodaro, which were densely settled around rivers. The cycle of rise and fall of cities is seen repeatedly in many cultures around the world. It is observed that only 3 per cent of world‟s population lived in urban area in 1800 and it is increased 14 per cent in 1900. Due to the industrial revolution, people were immigrated to urban centers, and the world‟s urban population increased by 30 per cent until 1950. Around 900 million people started living in urban areas in 2000. The migrant population has started living in urban sprawl with lack of infrastructure facilities like water supply, housing, sanitation etc. In 1812, James Hardy defined as "Vocabulary of the flash language", equivalent to the word "racket" or "criminal trade". In 1820‟s slum word is used first time for different location across the London those had low housing quality, poor sanitation facilities. In 1880s, it was the Housing Reform movement in England, which then introduced the idea of „slums‟ as meaning a house that is "materially unfit for human habitation". The idea of slums was introduced in 1880 during housing movement in England. The slums were delineated on city maps for planning. From 1890 to 1930, provisions were made under the law to remove slums in different countries. Laws were implemented for slums. Slums were given legal status, and standards were implemented.In the 21st century, slums are defined by (UN, state of the world's cities 2006/7, 2006) with the low quality of informal housing, overcrowded population and the absence of security, clean water and sanitation. Slums are considered now as a global problematic that needs solutions, strategies and a teamwork from all the nations to improve the life of the slum‟s dwellers.People are migrating from rural to urban area for better opportunities. It is observed industries like Kota DCM and coaching classes attract immigration toward city from rural areas as well as other states also. This research paper provides a more holistic synthesis of the problem.

Keywords: Slum, Population, GIS, Water Supply, Sewerage, Drainage

Definitions of Slum:

The characteristics associated with slums vary from place to place. Slums are generally characterized by urban decay, high rates of poverty, illiteracy and unemployment. Population density is found very high in slums. In poor and developing countries, a lack of sanitation facilities leads to the spread of deadly diseases in slums. Drug trafficking and very high crime rates are found in slums. Slums are also characterized shortage of housing without land tenure. Slums are located in hazard-prone areas with a high life risk for residents. Slums are defined on many stages some are mentioned below: -

The Oxford Dictionary defines slums as "A street, alley, court, etc., situated in a crowded district of a town or city and inhabited by people of a low class or by the very poor; a number of these streets or courts forming a thickly populated neighborhood or district where the houses and the conditions of life are of a squalid and wretched character.

According NSSO, "A slum is a compact settlement of at least 20 households with a collection of poorly built tenements, mostly of temporary nature, crowded together usually with inadequate sanitary and drinking water facilities in unhygienic conditions.

According to the Census of India in 2001, the slum areas can be broadly defined as follows:
(i) Any specified areas in a town or city that have been officially designated as "Slum" by the State/Local Government and Union Territories (UT) Administration under a relevant Act, such as a "Slum Act";
(ii) Any areas that have been recognized as "Slum" by the State/Local Government and UT Administration, Housing and Slums Boards, even if they have not been formally notified as such under any act; and
(iii) A compact area with a minimum population of 300 or approximately 60-70 households, characterized by poorly constructed and overcrowded tenements, unsanitary conditions, and inadequate infrastructure, including insufficient access to proper sanitation and drinking water facilities.

Based on the aforementioned definitions, we can define slum as an area where living conditions are poor but where economically poor people are trying to live their lives despite the risks.

DISTRIBUTION OF SLUMS

Global Scenario:
The urban population consists of fifty per cent of the world's population and is expected to rise by seventy per cent by the middle of this century. Twenty two per cent of the world's urban population lives in slums. Every third person in the world lives in a slum. Most of them living under life and health threatening conditions, often lacking several of the following conditions: access to adequate clean water, access to improved sanitation facilities, sufficient living space, dwellings of sufficient durability and structural quality and security of tenure.

The majority of them live in the developing world. 85 per cent of slum dwellers are concentrated in three regions: Central and Southern Asia (359 million), Eastern and South-Eastern Asia (306 million) and sub-Saharan Africa (230 million). World slum population is about 900 million.

The region wise slum distribution is like Latin America and the Caribbean region has 20.9%, Oceania has 23.7%, Northern Africa and Western Asia has 25.6%, Eastern and South-Eastern Asia has 27.2%, Central and Southern Asia has 31.2%, Sub-Saharan Africa 56.2% counts as slum population.

Indian Scenario:
The slum population is 52.37 million as per census 2001 record that is increased 65.49 million as per census 2011 record. Total 1743 town has slum population in 2001 and the number of towns having slum population increased 2613 in 2011.

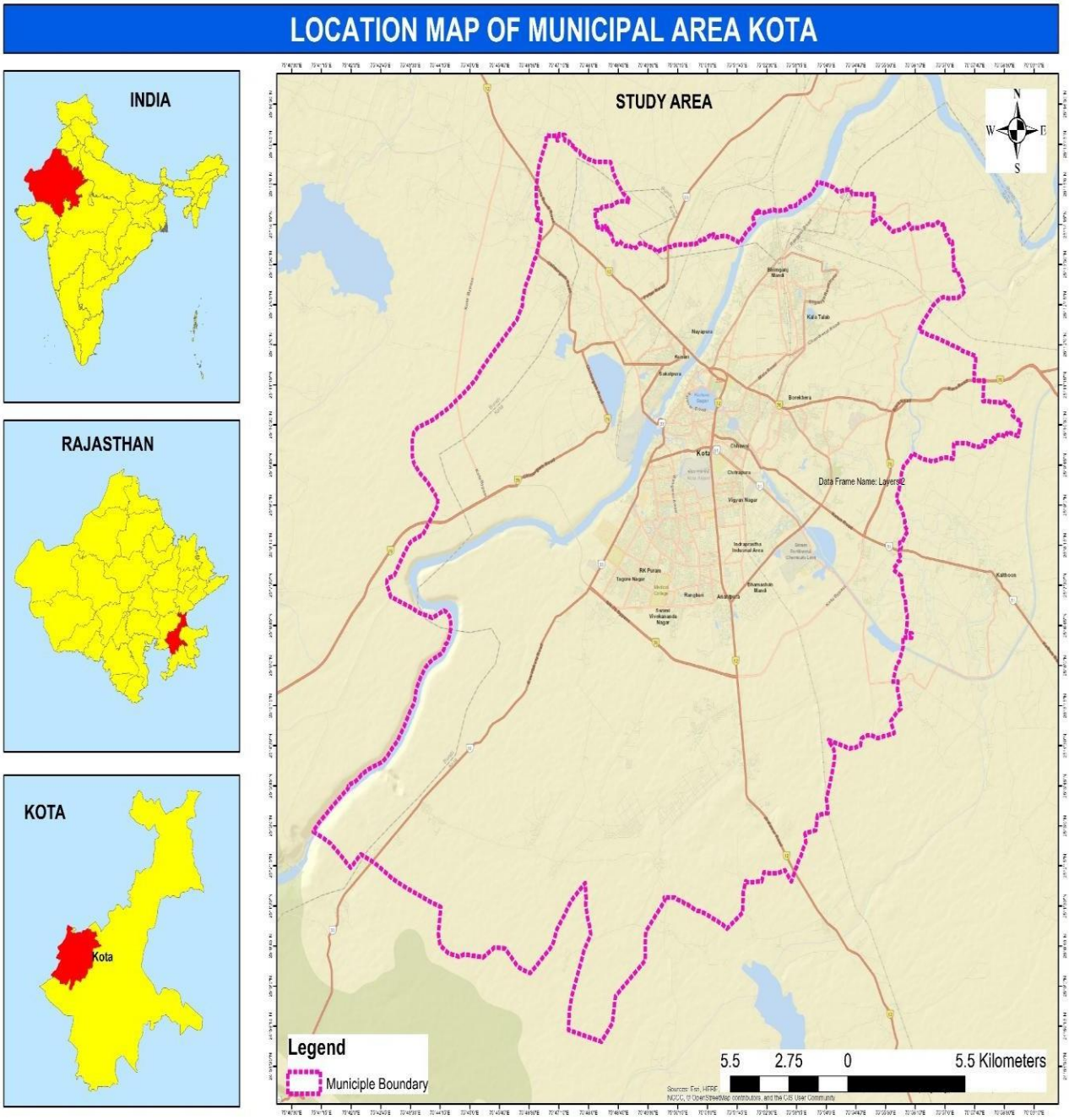
Maharashtra has the maximum slum population (18.1 %) as a per cent of national slum population followed by Andhra Pradesh (AP) (15.6 %). West Bengal is 9.8%, Uttar Pradesh is 9.5%, Tamil Nadu is 8.9%, Madhya Pradesh is 8.7%, Karnataka is 5%, Rajasthan is 3.2%. State share of slum population to total slum population of India.

Study Area
Kota city is an industrial and educational town as well as district headquarter of Kota District of Rajasthan is bounded by the state of M.P. in the North-east; Baran District of Rajasthan in East; Jhalawar in South; Chittaurgarh in South-west and Bundi in West. Kota city has an area of about 527.03 km².

The city had a population of over 10 lakhs as per 2011 Census which makes it the third largest city in the State of Rajasthan after the city of Jaipur (state capital) and Jodhpur. The slum population was 315794 of city as per census 2011.

Location of Study Area
Flourished along the eastern bank of Chambal River; The city of Kota is located on 25°18' North Latitude and 75°83' East Longitude at an altitude of 271 m. above mean sea level in the center of the southeastern region of Rajasthan (regions widely known as Hadoti the land of Hadas) is well connected to the State Capital – Jaipur and other major towns & cities of the Rajasthan State and the Country as well by Road, Rail and Airway.

Map 1: ***Location of Study Area***



Source: Prepared by researcher & prepare with the help of Arc GIS

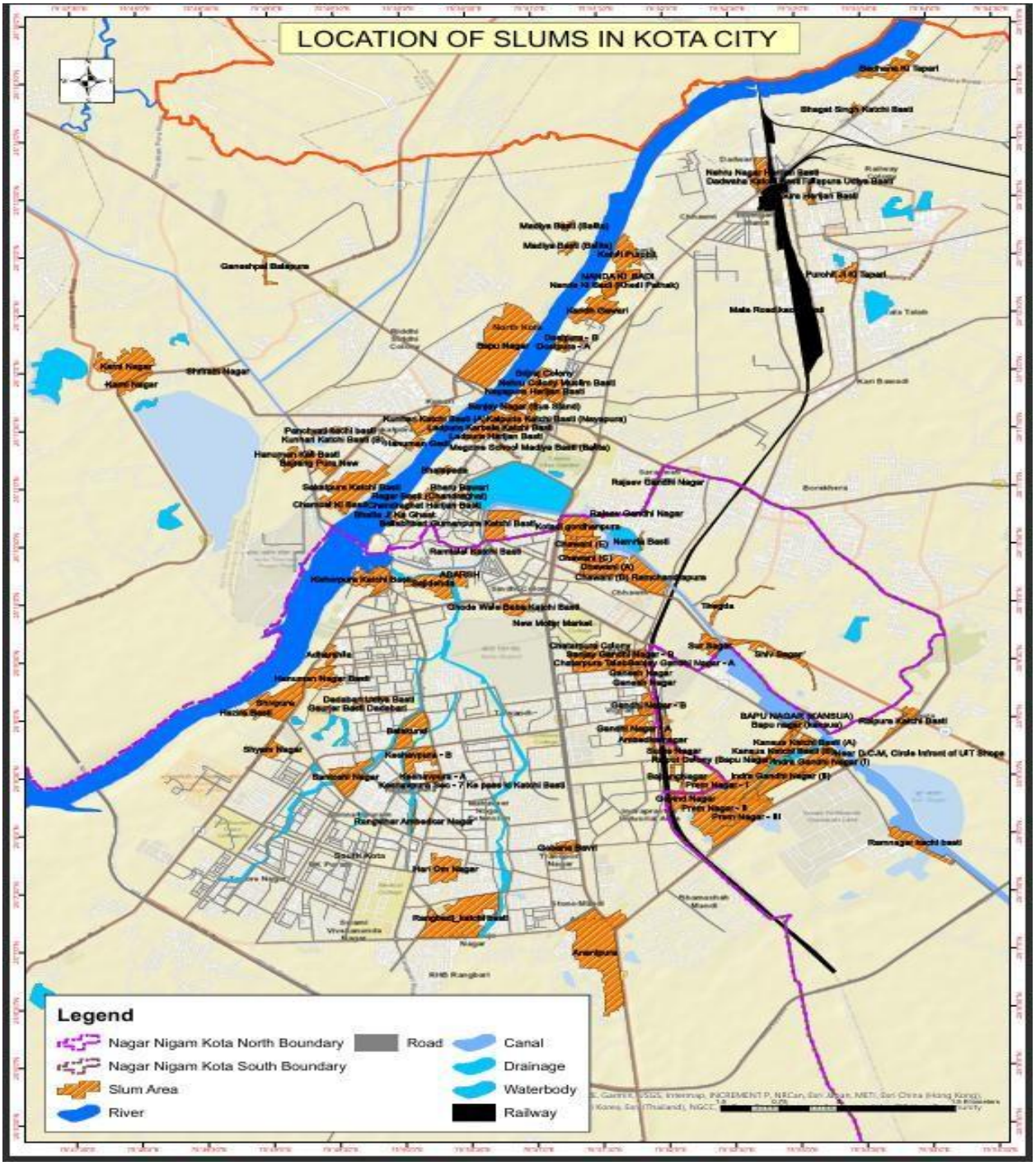
Distribution of Slums in study area:

Kota city has divided in two parts by Government of Rajasthan namely Kota South & Kota North. Kota north is divided into 70 administrative wards with population of 457540 and Kota South is divided into 80 administrative wards with population 544154.

There are 97 Slum pockets, 59 slums are under the jurisdiction of Urban Improvement Truest; remaining 38 slum pockets are under the jurisdiction of Nagar Nigam Kota.

66413 households were living in slums and slum population is 315794. This is around 31.88 per cent of total population of Kota city

Map 2 : ***Slum Map of Kota City***



Source: Prepared by researcher & prepare with the help of Arc GIS & UIT Kota

REVIEW OF LITERATURE

Literature review should objective evaluate the subject related pervious research. Significant researches have been outlined. Here I have studied different researches on slums, writers, geographers, planners and various people from beginning study of slums to till date.

C. Chandramouli (2003), Depicts about socio-economic and demographic characteristics of slums. The study presents total slum population of Tamilnadu in the selected 63 Municipal town that is 2,838,366 according to the census of India, 2001. Here more than one fourth of the Chennai population lives in Slums and they are greatly disadvantaged as for as quality of housing and availability of basic amenities like drinking water, electricity, latrines etc.

Arup Mitra (2005), analyzes the incidence of poverty among those slums, which are recognized by the local authorities, and not the purely illegal squatters people in Delhi. In this study author find out that per cent of population marginally above the poverty line is quite large considered these recognized slums. Here female headed households are worse off as compared to the male households in terms of per capita consumption expenditure. So, the impact of education on both quality of housing and per capita expenditure is positive, which has again important policy implications.

Tarannum Dana (2011), the paper discuses increasing slums in Dhaka city due to heavy influx of migrants from rural areas. In these slum areas all sorts of services are inadequate and general environmental scenario is hazardous. The study focuses on the status and practice regarding water, sanitation and hygiene, assessment of water resource availability and quality at source point of consumption; problems faced in getting safe drinking water; and knowledge of the features of hygienic latrine; awareness about health. The study is based on the health problems highlighting factors affecting the health of the population in slums for example due to general environmental condition, water supply system and the sanitation system. The study also focuses on other various reasons associated to poor living condition and their impact on health of the slum population. It is suggested that if conditions are to be improved then the problem of the poor living conditions and the health service needs to be addressed through the application of proper measures and planning by the different sectors of government and private sectors.

Objectives of the Study:

The rapid growth of slums and squatter settlements has largely contributed to the social, economic and environmental problems in urban areas especially, metro cities. So, keeping in the mind, to find out the increasing problem of slum dwellers in Kota, the basic objectives of the present study are: -

(i) To study the distribution of slums in Kota city
(ii) To analyse the basic infrastructure facilities of slum dwellers.

METHODOLOGY

GIS based mapping & sampling method is used for slum selection to complete research work.

GIS Mapping for identify slum location

Maps were prepared through GIS software by collecting data from various departments. The physical location of all the slums was analysed. Physical location was delineated in four categories. The general category means that a slum has zero vulnerability and has characteristics like an ordinary city. Those slums were located nearby a major road or major transport facility placed in the second category. The third category includes those slums are located on the banks of the river/major nalla/drainage. In category four, those slums are placed that are located near the railway line or on railway land. Out of 97 slum pockets located in Kota city, 11 slums were identified.

Table no 1: Physical Location of Slums

Sr. No.	1	2	3	4	5
Physical Location	General	Along Nallah / River	Along major Road/ Transport Facility	Along Railway line	Total
Number of Slums	36	37	17	7	97

Source: Researcher prepared location map with the help of Arc GIS 10.3

Slum Selection For Data Collection

Random sampling method is adopted to identify the slums for sample survey. Slums were digitized on map with ward map and slums were categorized based on slums population data. Eleven slums were identified from 97 slums from four categories. 10 per cent slums were selected from each category. 20 per cent households were surveyed and total sample size was finalized 1332 households.

Table no 2: **Selected Slums Details**

Sr. No.	Slum Name	Location	Slum Household	Population	Surveyed Households	Surveyed Population
1	Hanuman Nagar Basti	Along River/ Nalla	744	3260	149	690
2	Khedali Phatak (Purohit) Nanda Ji ki Badi	Along River/ Nalla	687	2217	137	616
3	Kunhari Katchi Basti	Along River/ Nalla	549	3104	110	601
4	Nanda Ji Badi	Along River/ Nalla	447	2217	89	489
5	Tullapura Harijan Basti	Along Railway line	132	605	26	133
6	Kotadi Goverdhanpura	General	895	5426	179	1085
7	Adharsila	General	555	2847	111	664
8	Shivpura	General	1273	5870	255	1173
9	Sanjay Nagar (Bus Stand) Katchi Basti	General	457	1914	91	389
10	Dadabadi Udiya Basti	Along Major Transport Area/Road	241	1205	48	245
11	Khand Gawari	Along Major Transport Area/Road	680	3538	136	699
	Total		6660	32203	1332	6784

Data Collection method

The data collected mode was primary survey because study was based on primary survey and secondary data was collected from different government departments. Primary data is collected through interview of respondents based on questionnaire. The data was collected for housing, economic, physical infrastructure and social infrastructure facilities of slums and slum dwellers.

Data Analysis method

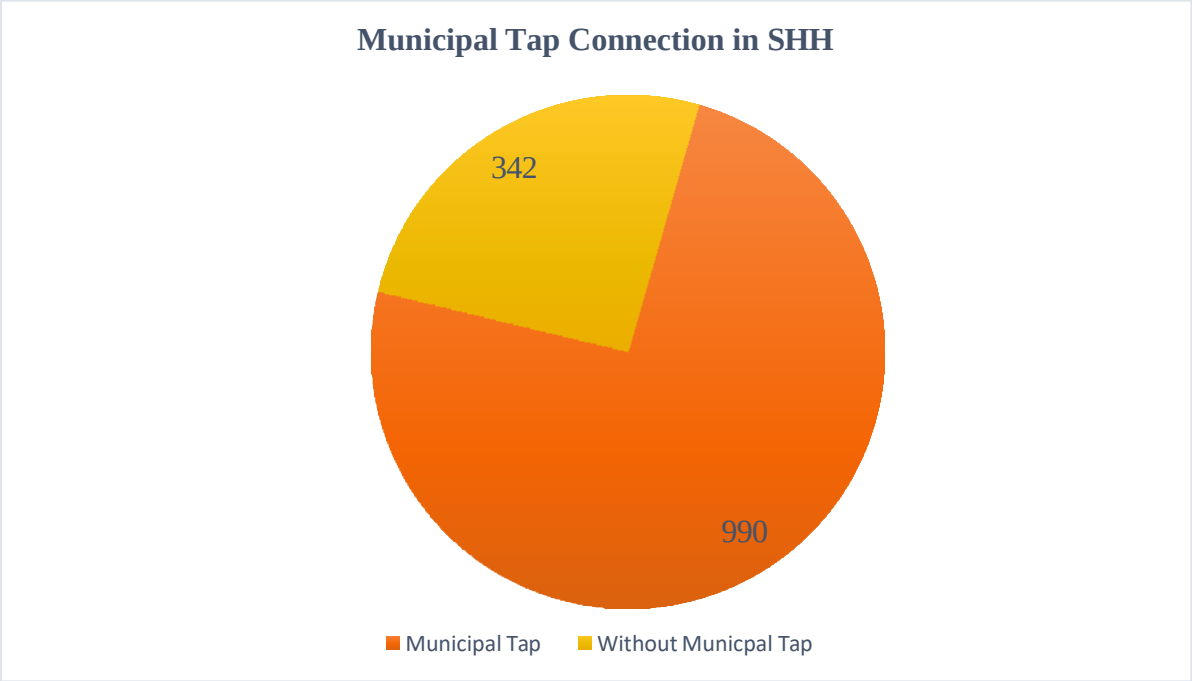
The collected data was tabulated and analysed via simple calculation tools though Microsoft excel sheet.

Drinking water supply system of Selected slums

Public Health Engineering Department Rajasthan have responsibility to organise water supply system of Kota city. The department providing water supply through municipal tap connection. The coverage of municipal tap is 85 per cent of Kota city.

The drinking water source in selected slums are classified into two categories namely through municipal tap and other sources. Total 1332 households were surveyed from selected 11 slums. Out of the total surveyed households a significant portion of 26 per cent did not have their own water supply connection.

These households have to depend on public tap, tanker and other sources of water supply. As socio-economic survey revealed that 990 slum households have municipal tap connection within premisses that is 74 per cent.



Source: Based on Field Survey 2024

Figure No. 1 – Municipal Tap Connection in SHH

Slum wise details of Municipal Tap Connection

Hanuman Nagar Basti

The municipal tap connection for surveyed households is described in table number 3. As many as 73 per cent surveyed households are depending on municipal tap connection for drinking water it is below the Kota city water supply coverage that is 85 per cent.

Khedali Phatak (Purohit) Nanda Ji ki Badi

The municipal tap connection for surveyed households is described in table number 3. As many as 71 per cent surveyed households are depending on municipal tap connection for drinking water it is below the Kota city water supply coverage that is 85 per cent.

Kunhari Katchi Basti

The municipal tap connection for surveyed households is described in table number 3. As many as 77 per cent surveyed households are depending on municipal tap connection for drinking water it is below the Kota city water supply coverage that is 85 per cent.

Nanda Ji Badi

The municipal tap connection for surveyed households is described in table number 3. As many as 69 per cent surveyed households are depending on municipal tap connection for drinking water it is below the Kota city water supply coverage that is 85 per cent.

Tullapura Harijan Basti

The municipal tap connection for surveyed households is described in table number 3. As many as 57 per cent surveyed households are depending on municipal tap connection for drinking water it is below the Kota city water supply coverage that is 85 per cent.

Kotadi Goverdhanpura

The municipal tap connection for surveyed households is described in table number 3. As many as 80 per cent surveyed households are depending on municipal tap connection for drinking water it is below the Kota city water supply coverage that is 85 per cent.

Adharsila

The municipal tap connection for surveyed households is described in table number 3. As many as 76 per cent surveyed households are depending on municipal tap connection for drinking water it is below the Kota city water supply coverage that is 85 per cent.

Shivpura
The municipal tap connection for surveyed households is described in table number 3. As many as 78 per cent surveyed households are depending on municipal tap connection for drinking water it is below the Kota city water supply coverage that is 85 per cent.

Sanjay Nagar (Bus Stand) Katchi Basti
The municipal tap connection for surveyed households is described in table number 3. As many as 82 per cent surveyed households are depending on municipal tap connection for drinking water it is below the Kota city water supply coverage that is 85 per cent.

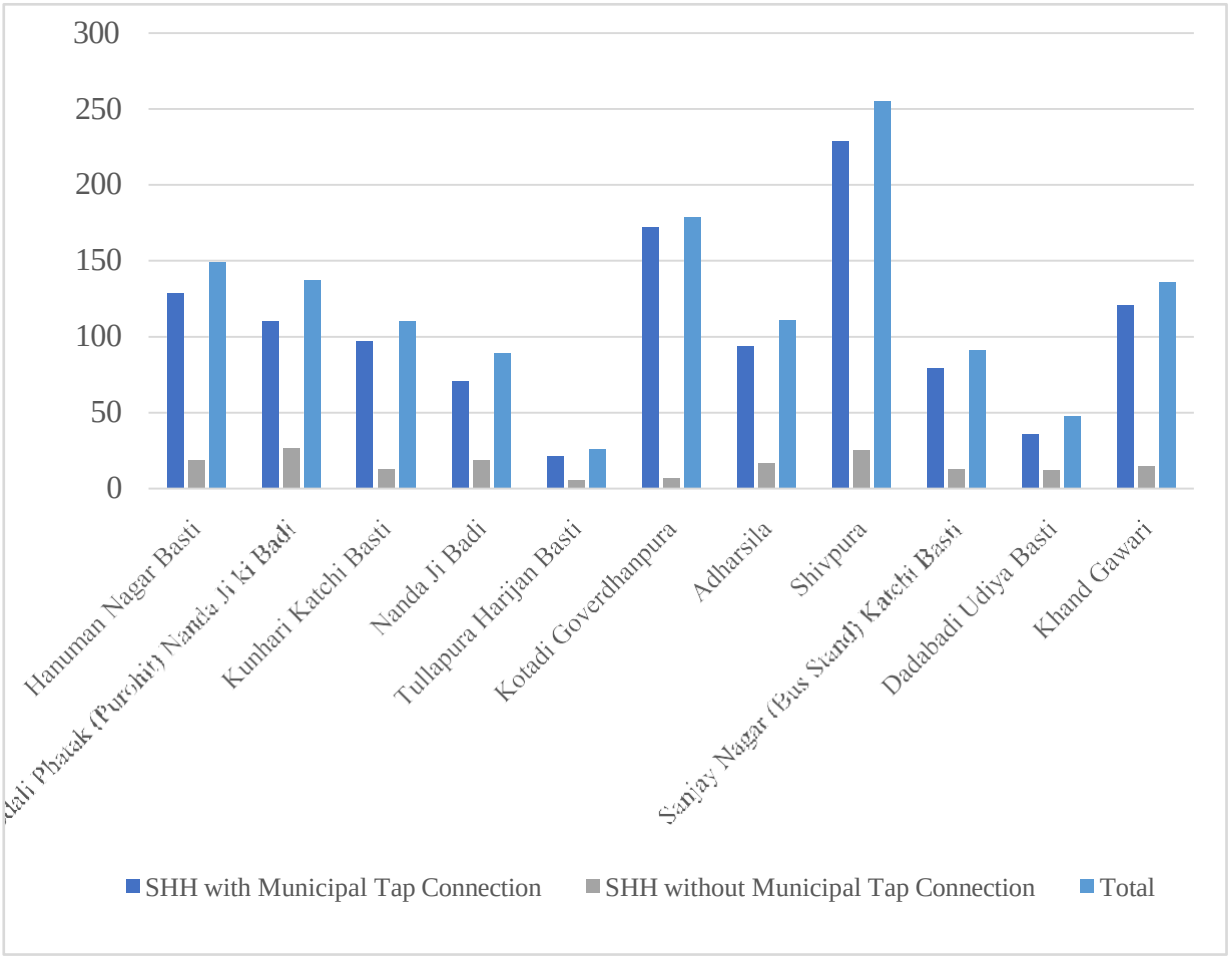
Dadabadi Udiya Basti
The municipal tap connection for surveyed households is described in table number 3. As many as 58 per cent surveyed households are depending on municipal tap connection for drinking water it is below the Kota city water supply coverage that is 85 per cent.

Khand Gawari
The municipal tap connection for surveyed households is described in table number 3. As many as 68 per cent surveyed households are depending on municipal tap connection for drinking water it is below the Kota city water supply coverage that is 85 per cent.

Table No. 3: **Slum wise details of Municipal Tap Connection**

Sr. No	Name Of Slum	SHH with Municipal Tap Connection	SHH with Municipal Tap Connection in per cent	SHH without Municipal Tap Connection	SHH without Municipal Tap Connection in per cent	Total
1.	Hanuman Nagar Basti	109	73	40	27	149
2.	Khedali Phatak (Purohit) Nanda Ji ki Badi	98	71	39	29	137
3.	Kunhari Katchi Basti	85	77	25	23	110
4.	Nanda Ji Badi	62	69	27	31	89
5.	Tullapura Harijan Basti	15	57	11	43	26
6.	Kotadi Goverdhanpura	144	80	35	20	179
7.	Adharsila	84	76	27	24	111
8.	Shivpura	198	78	57	22	255
9.	Sanjay Nagar (Bus Stand) Katchi Basti	75	82	16	18	91
10.	Dadabadi Udiya Basti	28	58	20	42	48
11.	Khand Gawari	92	68	44	32	136
	Total	990	74	342	26	1332

Source: Based on Field Survey 2024



Source: Based on Field Survey 2024

Figure No. 2 – Municipal Tap Connection in SHH

3.1.2 Drinking water source & location

As per discussion in pervious paragraph 990 surveyed household have municipal tap within premisses and 228 households were depended on public tap to fulfil their need for water. 113 households were depended on other water sources like tanker, handpump etc.

Hanuman Nagar Basti

The socio-economic survey data is described in table number 4. As many as 73 per cent surveyed households are depending on municipal tap connection for drinking water within their premisses. 23 per cent households are depended on public tap outside the premisses. 4 per cent household are depended on other sources of water supply like tanker, handpump etc. outside the premisses.

Khedali Phatak (Purohit) Nanda Ji ki Badi

The socio-economic survey data is described in table number 4. As many as 71 per cent surveyed households are depending on municipal tap connection for drinking water within their premisses. 23 per cent households are depended on public tap outside the premisses. 6 per cent household are depended on other sources of water supply like tanker, handpump etc. outside the premisses.

Kunhari Katchi Basti

The socio-economic survey data is described in table number 4. As many as 77 per cent surveyed households are depending on municipal tap connection for drinking water within their premisses. 17 per cent

households are depended on public tap outside the premisses. 6 per cent household are depended on other sources of water supply like tanker, handpump etc. outside the premisses.

Nanda Ji Badi

The socio-economic survey data is described in table number 4. As many as 69 per cent surveyed households are depending on municipal tap connection for drinking water within their premisses. 18 per cent households are depended on public tap outside the premisses. 13 per cent household are depended on other sources of water supply like tanker, handpump etc. outside the premisses.

Tullapura Harijan Basti

The socio-economic survey data is described in table number 4. As many as 57 per cent surveyed households are depending on municipal tap connection for drinking water within their premisses. 31 per cent households are depended on public tap outside the premisses. 12 per cent household are depended on other sources of water supply like tanker, handpump etc. outside the premisses.

Kotadi Goverdhanpura

The socio-economic survey data is described in table number 4. As many as 80 per cent surveyed households are depending on municipal tap connection for drinking water within their premisses. 12 per cent households are depended on public tap outside the premisses. 08 per cent household are depended on other sources of water supply like tanker, handpump etc. outside the premisses.

Adharsila

The socio-economic survey data is described in table number 4. As many as 76 per cent surveyed households are depending on municipal tap connection for drinking water within their premisses. 14 per cent households are depended on public tap outside the premisses. 10 per cent household are depended on other sources of water supply like tanker, handpump etc. outside the premisses.

Shivpura

The socio-economic survey data is described in table number 4. As many as 78 per cent surveyed households are depending on municipal tap connection for drinking water within their premisses. 14 per cent households are depended on public tap outside the premisses. 8 per cent household are depended on other sources of water supply like tanker, handpump etc. outside the premisses.

Sanjay Nagar (Bus Stand) Katchi Basti

The socio-economic survey data is described in table number 4. As many as 82 per cent surveyed households are depending on municipal tap connection for drinking water within their premisses. 15 per cent households are depended on public tap outside the premisses. 3 per cent household are depended on other sources of water supply like tanker, handpump etc. outside the premisses.

Dadabadi Udiya Basti

The socio-economic survey data is described in table number 4. As many as 58 per cent surveyed households are depending on municipal tap connection for drinking water within their premisses. 17 per cent households are depended on public tap outside the premisses. 25 per cent household are depended on other sources of water supply like tanker, handpump etc. outside the premisses.

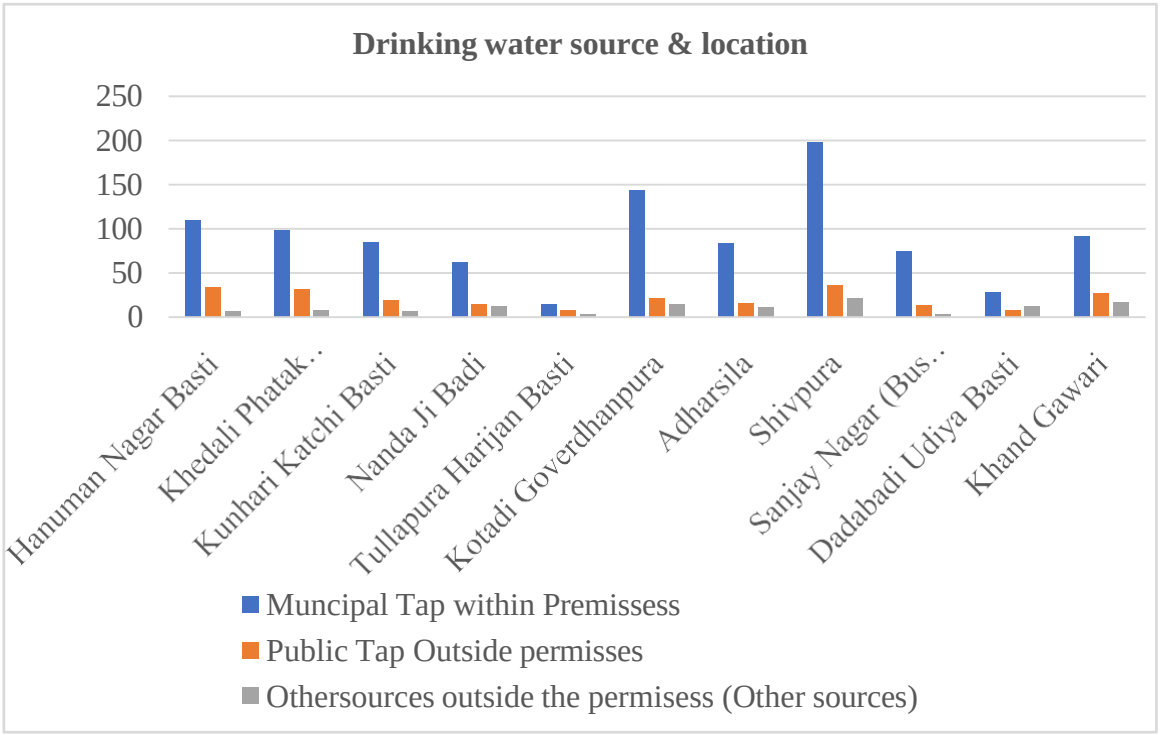
Khand Gawari

The socio-economic survey data is described in table number 4. As many as 68 per cent surveyed households are depending on municipal tap connection for drinking water within their premisses. 20 per cent

households are depended on public tap outside the premisses. 13 per cent household are depended on other sources of water supply like tanker, handpump etc. outside the premisses.

Table no. 4: **Source of Water supply & location**

Sr. No	Name Of Slum	Municipal Tap within Premisses	Per cent of SHH	Public Tap outside the premisses	Per cent of SHH	Other Source outside the premisses	Per cent of SHH	Total
1.	Hanuman Nagar Basti	109	73	34	23	6	4	149
2.	Khedali Phatak (Purohit) Nanda Ji ki Badi	98	71	31	23	8	6	137
3.	Kunhari Katchi Basti	85	77	19	17	6	5	110
4.	Nanda Ji Badi	62	69	15	17	12	13	89
5.	Tullapura Harijan Basti	15	57	8	31	3	12	26
6.	Kotadi Goverdhanpura	144	80	21	12	14	8	179
7.	Adharsila	84	76	16	14	11	10	111
8.	Shivpura	198	78	36	14	21	8	255
9.	Sanjay Nagar (Bus Stand) Katchi Basti	75	82	13	14	3	3	91
10.	Dadabadi Udiya Basti	28	58	8	17	12	25	48
11.	Khand Gawari	92	68	27	20	17	13	136
	Total	990	74	228	17	113	8	1331

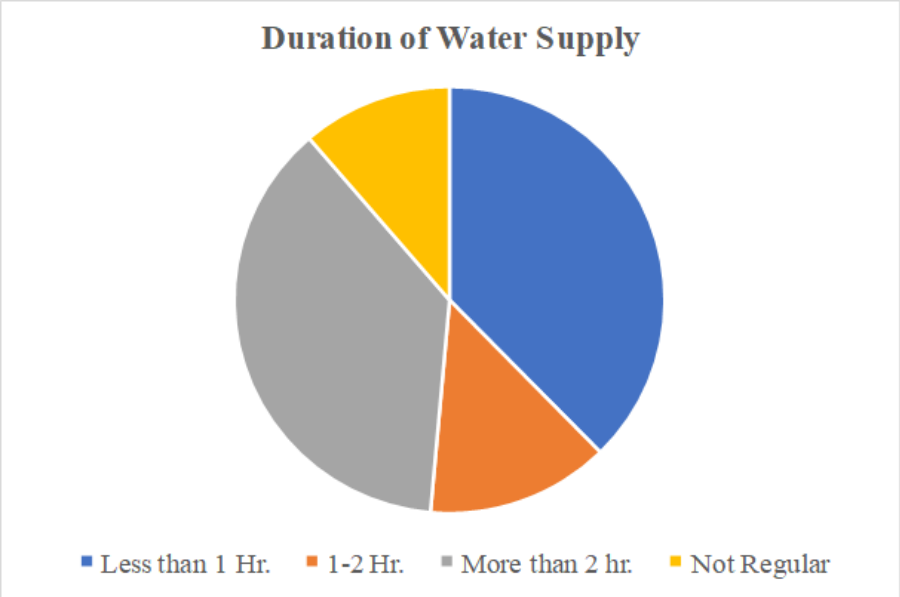


Source: Based on Field Survey 2024

Figure no 3.3: Drinking water source & location

3.1.3 Duration of Water Supply

There is variation in the duration of water supply in slums according to their location. 38 per cent households have less than one hour of water supply in their houses. 14 per cent households have 1-2 hours of daily water supply. 37 per cent of households were ported that the water supply duration is more than 2 hours. 11 per cent of households reported irregular water supply in slums. Table no. 3.3 and figure no. have presented the data related to the water supply duration of slums.



Source: Based on Field Survey 2024

Figure No. 3. Duration of Water Supply

Table No 5: Duration of Water Supply

Sr. No	Name Of Slum	Less than 1 hour daily	Per cent of SHH	1-2 hrs daily	Per cent of SHH	More than 2 hrs	Per cent of SHH	Not regular	Per cent of SHH	Total
1	Hanuman Nagar Basti	77	51.68	29	43	25	16.78	18	12.08	149
2	Khedali Phatak (Purohit) Nanda Ji ki Badi	63	45.99	39	53	25	18.25	10	7.30	137
3	Kunhari Katchi Basti	54	49.09	23	25	32	29.09	1	0.91	110
4	Nanda Ji Badi	30	33.71	17	15	34	38.20	8	8.99	89
5	Tullapura Harijan Basti	0	0.00	13	3	5	19.23	8	30.77	26
6	Kotadi Goverdhanpura	110	61.45	17	30	44	24.58	8	4.47	179
7	Adharsila	29	26.13	4	4	63	56.76	15	13.51	111
8	Shivpura	58	22.75	12	31	165	64.45	21	8.20	256
9	Sanjay Nagar (Bus Stand) Katchi Basti	20	22.03	5	5	62	68.13	4	4.40	91
10	Dadabadi Udiya Basti	15	31.25	13	6	0	0.00	20	41.28	48
11	Khand Gawari	45	33.09	12	16	41	30.16	38	27.96	136
	Total	501		184		496		151		1332

Source: Based on Field Survey 2024

Hanuman Nagar Basti
The socioeconomic survey data is described in table number 5. The table showed that 51 per cent of households reported the duration of water supply was less than 1 hour. 19 per cent of households reported the duration of water supply 1- 2 hr. daily. The duration of water supply was more than 2 hrs daily in 16 per cent of households. 12 per cent of households are facing irregularity in the water supply system in Hanuman Nagar Basti.

Khedali Phatak (Purohit) Nanda Ji ki Badi
The socioeconomic survey data is described in table number 5. The table showed that 46 per cent of households reported the duration of water supply was less than 1 hour. 21 per cent of households reported the duration of water supply 1- 2 hr. daily. The duration of water supply was more than 2 hrs daily in 29 per cent of households. 1 per cent of households are facing irregularity in the water supply system in this slum.

Kunhari Katchi Basti
The socioeconomic survey data is described in table number 5. The table showed that 34 per cent of households reported the duration of water supply was less than 1 hour. 19 per cent of households reported the duration of water supply 1- 2 hr. daily. The duration of water supply was more than 2 hrs daily in 38 per cent of households. 9 per cent of households are facing irregularity in the water supply system in this slum.

Nanda Ji Badi
The socioeconomic survey data is described in table number 5. The table showed that 34 per cent of households reported the duration of water supply was less than 1 hour. 19 per cent of households reported the duration of water supply 1- 2 hr. daily. The duration of water supply was more than 2 hrs daily in 38 per cent of households. 9 per cent of households are facing irregularity in the water supply system in this slum.

Tullapura Harijan Basti
The socioeconomic survey data is described in table number 5. The table showed that 54 per cent of households reported the duration of water supply was less than 1 hour. 15 per cent of households reported the duration of water supply 1- 2 hr. daily. 31 per cent of households are facing irregularity in the water supply system in this slum.

Kotadi Goverdhanpura
The socioeconomic survey data is described in table number 5. The table showed that 61 per cent of households reported the duration of water supply was less than 1 hour. 9 per cent of households reported the duration of water supply 1- 2 hr. daily. The duration of water supply was more than 2 hrs daily in 25 per cent of households. 5 per cent of households are facing irregularity in the water supply system in this slum.

Adharsila
The socioeconomic survey data is described in table number 5. The table showed that 26 per cent of households reported the duration of water supply was less than 1 hour. 4 per cent of households reported the duration of water supply 1- 2 hr. daily. The duration of water supply was more than 2 hrs daily in 56 per cent of households. 14 per cent of households are facing irregularity in the water supply system in this slum.

Shivpura
The socioeconomic survey data is described in table number 5. The table showed that 23 per cent of households reported the duration of water supply was less than 1 hour. 47 per cent of households reported the duration of water supply 1- 2 hr. daily. The duration of water supply was more than 2 hrs daily in 22 per cent of households. 8 per cent of households are facing irregularity in the water supply system in this slum.

Sanjay Nagar (Bus Stand) Katchi Basti
The socioeconomic survey data is described in table number 5. The table showed that 22 per cent of households reported the duration of water supply was less than 1 hour. 5 per cent of households reported the duration of water supply 1- 2 hr. daily. The duration of water supply was more than 2 hrs daily in 68 per cent of households. 5 per cent of households are facing irregularity in the water supply system in this slum.

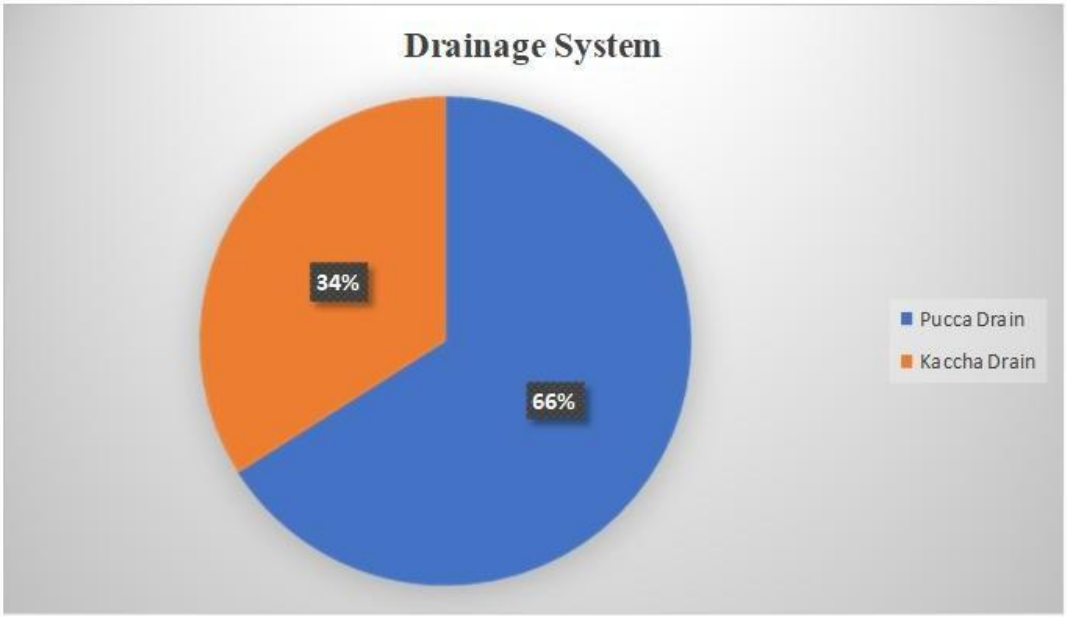
Dadabadi Udiya Basti
The socioeconomic survey data is described in table number 5. The table showed that 31 per cent of households reported the duration of water supply was less than 1 hour. 28 per cent of households reported the duration of water supply 1- 2 hr. daily. 41 per cent of households are facing irregularity in the water supply system in this slum.

Khand Gawari
The socioeconomic survey data is described in table number 5. The table showed that 33 per cent of households reported the duration of water supply was less than 1 hour. 9 per cent of households reported the duration of water

supply 1- 2 hr. daily. The duration of water supply was more than 2 hrs daily in 30 per cent of households. 18 per cent of households are facing irregularity in the water supply system in this slum.

Sewerage system in selected slums

During the survey, it was observed that slums were not connected to the sewerage system. The drainage system of the surveyed slum was found in the worst condition. Slum household wastewater was discharged into open drains, which were choked, and wastewater overflowed into the streets. The worst drainage system causes diseases in slums. Survey data revealed that 66 per cent of households discharged wastewater into pucca drains, and 34 per cent had kaccha drains.



Source: Based on Field Survey 2024

Figure No. 4 : Drainage system

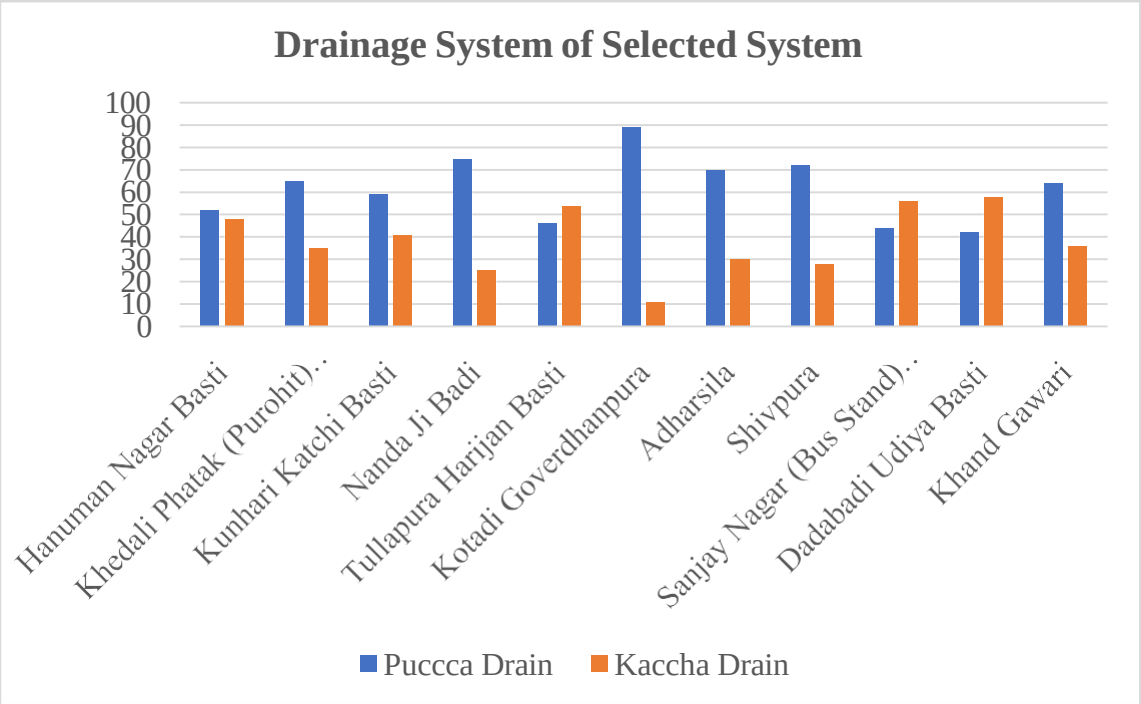
Table no. 6: Drainage System In Selected Slums

Sr. No	Name of Slum	Puccka Drain in SHH	Per cent	Kaccha Drain in SHH	Per cent	Total
1	Hanuman Nagar Basti	78	52	71	48	149
2	Khedali Phatak (Purohit) Nanda Ji ki Badi	89	65	48	35	137
3	Kunhari Katchi Basti	65	59	45	41	110
4	Nanda Ji Badi	67	75	22	25	89
5	Tullapura Harijan Basti	12	46	14	54	26
6	Kotadi Goverdhanpura	160	89	19	11	179
7	Adharsila	78	70	33	30	111
8	Shivpura	184	72	71	28	255
9	Sanjay Nagar (Bus Stand) Katchi Basti	40	44	51	56	91
10	Dadabadi Udiya Basti	20	42	28	58	48
11	Khand Gawari	87	64	50	36	137
	Total	880		452		1332

Source: Based on Field Survey 2024

Drainage system in selected slums

The survey data revealed than Hanuman Nagar Basti has 52 per cent household have pucca drains in front of their houses and 48 per cent of household has kaccha drains to discharge of waste water. Khedali Phatak (Purohit) Nanda Ji ki Badi has 65 per cent household have pucca drains in front of their houses and 35 per cent of household has kaccha drains to discharge of waste water. Kunhari Katchi Basti has 59 per cent household have pucca drains in front of their houses and 41 per cent of household has kaccha drains to discharge of waste water. Nanda Ji Badi Basti has 75 per cent household have pucca drains in front of their houses and 25 per cent of household has kaccha drains to discharge of waste water. Tullapura Harijan Basti has 46 per cent household have pucca drains in front of their houses and 54 per cent of household has kaccha drains to discharge of waste water. Kotadi Goverdhanpura has 89 per cent household have pucca drains in front of their houses and 11 per cent of household has kaccha drains to discharge of waste water. Adharsila has 70 per cent household have pucca drains in front of their houses and 30 per cent of household has kaccha drains to discharge of waste water. Shivpura has 72 per cent household have pucca drains in front of their houses and 28 per cent of household has kaccha drains to discharge of waste water. Sanjay Nagar (Bus Stand) Katchi Basti has 44 per cent household have pucca drains in front of their houses and 56 per cent of household has kaccha drains to discharge of waste water. Dadabadi Udiya Basti has 42 per cent household have pucca drains in front of their houses and 58 per cent of household has kaccha drains to discharge of waste water. Khand Gawari 64 per cent household have pucca drains in front of their houses and 36 per cent of household has kaccha drains to discharge of waste water. There was variation in drainage system.



Source: Based on Field Survey 2024

Figure No. 5 : Slum wise Drainage system

CONCLUSION

The study concludes that mostly slums were developed surrounding the Chamble river and other government lands like railway, forest department etc. There was gap between coverage of slums and city area. The SDG goals 2030 settled KPI indicators to achieve 100 per cent coverage of water supply but only 74 per cent households have municipal tap connections present in slums.

The sewerage network was not laid in slums. Mostly slums households reported kaccha drainage system front their houses. Most of the slum's households have reported non-availability of infrastructure facilities.

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