

# Distribution of Sanitation Services in Rajasthan

Dr. Babita<sup>1</sup>, Dr Dheeraj Kumar<sup>2</sup>

<sup>1</sup> Assistant Professor  
Department of Geography  
Maharani Girls PG College, Rampura, Alsisar, Jhunjhunu

<sup>2</sup> Assistant professor (Guest)  
SBD govt PG College Sardarshahar

**Abstract:** Sanitation included the municipal amenities such as supply of filtered water and sewage and refuse disposal as well as the public health and medical facilities. Owing to the low rate of urbanisation and overall backwardness of the state, the public health facilities are far from satisfactory. The physical layout of villages and small towns does not favour sanitation. There are only 222 cities in Rajasthan, but only to 16.50 percent of state population filtered water and sewage facilities are available. Out of these towns only 7 cities (Ajmer, Bikaner, Alwar, Jaipur, Jodhpur, Kota and Udaipur) are of the category of class I cities and other 7 cities (Tonk, Churu, Beawar, Ganganagar, Sikar, Bhilwara and Bharatpur) are of Class II types, where municipal amenities are tolerably good (2001 census). In rural areas, there is practically no facility of filtered water and disposal of refuse and sewage. Narrow lanes function as drainage channels and adjoining fields as lavatories.

**Keywords:** Rajasthan, municipal amenities, of urbanisation and overall backwardness, Ajmer, Bikaner, Alwar, Jaipur, Jodhpur, Kota and Udaipur

Men and their pets usually share the same roof and drinking water from common ponds. It will be seen that the diseases of zoonoses type are due to this type of living. The greater incidence of Guinea-worm, tape worm, ring-worm, cow-for and skin disorders are the direct reflection of inadequate social hygiene.

Housing is a part of total environment of man, and being a part, it is to some extent is responsible for the status of man's health and well being. In housing and health, sanitation facility is one of the most important aspect, in other words to say, sanitation is a way of life, it is the quality of living i.e. expressed in the clean home, the clean neighbourhood and the clean community. In the past, sanitation was centred on the sanitary disposal of human excreta, even now to eighty percent people of Rajasthan the world of sanitation still means the construction of latrines only, but in actual fact, this term covers the whole field of controlling the environment with a view to prevent disease and promote health status. Man has controlled to much extent a number of factors in his cultural environment e.g. food, water, housing, clothing and sanitation. These controllable factors are those to which the reports of world health organization has included the above mentioned cultural factors in the 'Standard of Living'. Further in this context, the standard of living in this aspect results to form the society classes in the community in the community or residing population of a place or study area.

Due to respective creation of the instability in the components eco-system in several parts of the world, the phenomenon of environmental imbalance is speedily increasing in many part of the world. It is basically due to the men's destructive nature with the natural components of the ecosystem of the earth. Due to different kinds of sources of pollution, the concentration of certain kinds of pollutants are increasing in several parts of the earth e.g. in the air, the water, the soil as well as on the surface. By thus, environmental pollution is becoming as a natural hazard in many parts of the world, specially more in developing country and also for the

area under study i.e. Rajasthan. Due to the speedily increasing graph of the growth of population and simultaneously decreasing graph of the quantity of available resources, the condition becomes more dangerous when the quality of the particular natural resource is polluted by the men's activities in that particular area. Naturally, it exhibits the adverse impact on the health aspect of the residing population of that particular area is concerned.

By thus, one can visualise very well that the percentage of the areas under different kinds of pollution is gradually increasing which decreases the purity of the prevailing natural components like the air, the water and, the soil and surface. No part of the world is absolutely free from any kind of environmental pollution, specially it has more significance in the part of developing countries like India. Within our country no part of the state except few natural places which are yet to much extent free from the impact of environmental pollution.

The increasing percentage of air pollution by the dust and noise generally by the increasement of traffic and transport vehicles, also by the increasement of gaseous pollutants concentration in the air (by vehicles and the industries); disposal of waste materials, excessive use of chemical fertilizers and unsystematically scattered excreta and refuse disposal creates the soil and surface pollution, the problem is further magnified by the disposal of domestic waste water, this all adverse the sanitation environment of the particular area and becomes a causal factor for the spread of various kinds of disease, specially Seasonal diseases are concerned. In other words to say sanitation system in a particular area has significant role in health environment of residing population is concerned.

The great sanitary awakening which took place in England in 1845 is yet to be born. The twin problems of environmental sanitation are lack of safe water in many areas of the country and primitive methods of excreta disposal. Besides these, there has been a growing concern about the impact of "new" problems resulting from population explosion,

urbanization and industrialization leading to hazards to human health in the air, in water and in the food chain. At the United Nations Water Conference in Argentina, (1877), it was recommended that the priority should be given to the provision of safe water supply and sanitation service for all by the year 1990, and the period (1981-1990) was designated as the 'International Water Supply and Sanitation Decade'. The problem is gigantic. At present safe water is available to 80 percent of the urban and 47 percent of the rural population; and adequate facilities for waste disposal to 30 percent of the urban and one percent of the rural population.

Sewage is waste water from a community containing solid and liquid excreta removed from houses, streets and yard washings, factories and industries. It resembles dirty water with an unpleasant smell. The term "sullage" is applied to waste water which does not contain human excreta. If people use more water there will be more sewage.

Rajasthan is a land of villages and 80 percent of her population live in villages. The problem of sanitation therefore is one of "Rural sanitation". Surveys have shown that 98 percent of the rural population "to the open fields" for defecation. In urban areas, the latrine is considered a necessary part of a house. The problem in rural sanitation is how to overcome the resistance of the village people, and induce them to use sanitary latrines. Research studies have indicated that there is only one way to solve the problem i.e. through health education. Social scientists have listed the reasons why villagers do not accept latrines. Some of the reasons found in the surveys are : 1. Latrines are associated with a bad smell, 2. They are the breeding places of flies, 3. They are something foul and dirty so that one should not have them close to house, 4. Latrines are costly and beyond their means to install and 5. They do not know how faecal born diseases are spread. In short people have a bad 'image' of latrines in their minds.

#### **National Water Supply and Sanitation Programme :**

In September 1954, the Minister of Health, Government of India, announced the National water supply and sanitation programme as part of the overall health schemes and made specific provisions to assist the states. Approved urban schemes received assistance by way of loans while rural schemes relating to population units not exceeding 5,000 men were given 50 percent grant-in-aid by the centre. The programme began with an aid of about Rs. 3 crores offered by the U.S.A.I.D. under an operational Agreement to provide material, equipment and technical services. According to 2001 census, only 34 percent of the Urban population had adequate water supply. With the completion of the third plan it was expected that 48 percent of the Urban population would have protected water supply.

#### **Environment and Health :**

The health status of an individual, a community or a nation is determined by the interplay and integration of two ecological universes—the internal environment of man himself and the external environment consisting of three major components—physical, biological and social, all closely related. The physical environment encompasses the non-living things and physical forces affecting man, water, air, ventilation, lighting, noise, climate. The biologic environment include the living things of the plant and animal kingdom. The social environment comprises a complex interplay of factors and conditions such as cultural values, customs, habits, beliefs, attitudes, economic status, occupation, religion, standard of living, social and political organization.

In the modern concept, disease is due to a disturbance in the delicate balance between man and his environment. Of the three ecological factors (agent host and environment) responsible for disease, the disease agent is usually identified with the help of the laboratory; the host is available for study; but the environment from which the patient comes is largely unknown. Yet frequently, the key to the nature, occurrence, prevention and control of diseases lies in the environment. Without this knowledge, this key may not be available to the physician who desires to cure disease, prevent or control it.

The Dictionary (Oxford) meaning of the word sanitation is "the Science of safeguarding health". One of the best definitions is that given by the National Sanitation Foundation of the U.S.A., which is as follows : "Sanitation is a way of life. It is the quality of living i.e. expressed in the clean home, the clean farm, the clean business, the clean neighbourhood and the clean community. Being a way of life it must come from within the people; it is nourished by knowledge and grows as an obligation and an ideal in human relation." The WHO defines environmental sanitation as "the control of all those factors in man's physical environment which exercise or may exercise a deleterious effect on his physical development, health and survival."

In the past, sanitation was centred on the sanitary disposal of human excreta. Even now, to many people, sanitation still means the construction of latrines. In actual fact, the term sanitation covers the whole field of controlling the environment with a view to prevent disease and promote health. Man has already controlled a number of factors of his environment, food, water, housing, clothing, sanitation. These controllable factors are those included in the "Standard of living". It is the control of these factors that has been responsible for considerable improvement in the health of the people during the past century in the developed countries. However, man's mastery over his environment is not complete. As old problems are being solved, new problems are arising. Air pollution is of growing concern in many urban centres. Industrial growth has given rise to the problems of environmental pollution by industrial wastes. Advances in nuclear technology have produced the problem of radio-activated pollution of the environment. The demographic growth and fast urbanisation all over the world are bringing profound social transformation and a healthy environment is becoming more and more complex. The term environmental sanitation is now being replaced by environmental health. Proper environmental health now requires the services of the public health qualified doctor, the epidemiologist, the public health engineer, the town planner, the sociologist, the economist, and the health inspector. A purely medical or engineering approach by itself is no longer sufficient; a combined multidisciplinary programme of action is needed to achieve a healthy environment.

India is still logging far behind many countries in the field of environmental health. The basic problems of safe water supply and sanitary disposal of human excreta are yet to be solved. Most of the ill-health in the country is due to defective environment. Since more than 80 percent of the population of India live in rural areas, the problem is one of rural sanitation. The first step in any health programme is the elimination through environmental control of those factors which are harmful to health. The environmental factors which are basic and fundamental to individual and community health are discussed.

**Basic Health Need :**

Much of the ill-health in the under developed countries is largely due to lack of safe drinking water. There can be no state of positive community health and well-being without safe water supply. Water intended for human consumption should be "Safe and wholesome". It is a basic health need. Safe and wholesome water is defined as water i.e. (a) free from pathogenic agents (b) free from harmful chemical substances (c) pleasant to the taste and (d) usable for domestic purposes. Water is said to be contaminated when it contains infective and parasitic agents, poisonous chemical substances, industrial or other wastes or sewage. The term polluted water is synonymous with contaminated water. Pollution and contamination are the result of human activity.

**Water Needs :**

From the stand point of public health, water should be provided in adequate volume. A limited supply will be of very little benefit, however, superior the quality of water may be. A daily supply of 35.40 gallons per head is considered an adequate allowance. The consumption of water, however, depends upon climatic conditions, standard of living and habits of the people.

**Rain Water :**

Rain water is the purest water in nature. Physically it is clear, bright and sparkling, chemically it is a very soft water containing only traces of dissolved solids (0.005 percent). Being soft, it has a corrosive action on lead pipes. Bacteriologically, rain water from clean districts is free from pathogenic agents. Rain is the prime source of all water. A part of the rain water sinks into the ground to form ground water; part of it evaporates back into the atmosphere and some runs off to form streams and rivers which flow ultimately into the sea. Some of the water in the soil is taken up by the plants and is evaporated in turn by the leaves. The events are spoken of as "water cycle"

Rain water tends to become impure as it passes through the atmosphere. It picks up suspended impurities from the atmosphere, such as dust, soot and micro-organisms and gases, such as carbon dioxide, nitrogen, oxygen, ammonia. The Ganganagar rain water is collected on roof tops and stored for drinking purposes.

**Surface Water :**

Surface water originates mostly from rain water. Majority of Indian cities and towns depend upon surface water sources.

**Impounding Reservoirs :**

They are artificial lakes constructed usually of earth work or masonry in which large quantities of surface water is stored. Dams built across rivers and mountain streams also provide large reserves of surface water. The area draining into the reservoir is called "Catchment area". Impounding reservoirs usually furnish a fairly good quality of water. The water is usually clear, palatable and ranks next to rain water in purity. The water is usually soft and considered to be free of pathogenic organisms.

**Rivers :**

Many rivers furnish a dependable supply of water. The chief drawback of river water is that it is always grossly polluted and quite unfit for drinking without treatment. River water contains dissolved and suspended impurities of all kinds. The bacterial count, including the human intestinal organisms may be very high. Certain amount of self purification does occur in river water by natural forces of purification such as dilution, sedimentation, aeration, oxidation, sunlight, plant and

animal life but these agencies are not sufficient to render the water palatable. River water needs purification before it can be used for drinking purposes.

**Tanks :**

Tanks are large excavations in which surface water is stored. They are an important source of water supply in some Indian villages. Tank water should never be considered safe for human consumption, because it is subject to unlimited possibilities of contamination. Guinea worm disease is quite a public health problem in places where tanks are the sources of water supply. A certain amount of natural purification does take place in tank water because of storage, oxidation and other agencies but these are not sufficient to render the water safe.

**Ground Water :**

Ground water is the cheapest and most practical means of providing water to small communities. Ground water is superior to surface water, because the ground itself provides an effective filtering medium. The advantages of ground water are (1) it is likely to be free from pathogenic agents (2) it usually requires no treatment (3) the supply is likely to be certain even during dry season.

The disadvantages are (1) it is high in mineral contents, salts or calcium and magnesium which render the water hard (2) it requires pumping or some arrangement to lift the water. The usual ground water sources are wells and springs; wells have been classified into shallow and deep wells, dug and tube wells.

**Shallow Wells :**

Wells are the main source of water supply in Indian villages and towns. Technically wells are of two kinds, shallow and deep. A shallow well is one which taps the water from above the first impervious layer in the ground. The term "Shallow" has nothing to do with the depth of the well. Most of the wells in Indian are of the shallow type. Generally speaking, shallow wells are notoriously liable to pollution from neighbouring sources of contamination such as latrines, urinals, drains, pools, soakage pits and collections of manure. Shallow wells are therefore a health hazard to the community if they are made sanitary.

**Deep Wells :**

A deep well is one which penetrates the first impervious layer in the ground and taps the water lying beneath the impervious layer.

**Springs :**

A spring is ground water which finds its way to the surface because of certain topographical characteristics of the land. They are an unimportant source of water supply in this country. Wells may also be classified, according to the method of construction into dug wells and tube wells. Dug-wells are by far the commonest type in India. Two types of dug wells exist in our rural area (a) the Katcha well and (b) the masonry or pucca well. The Katcha well is a hole dug into the water bearing stratum. The pucca well is an open well built of bricks or stones. Step wells are a kind of pucca wells which are becoming obsolete fortunately. Steps are constructed into these wells to enable people to descend into the well to fetch water or quench their thirst. In these wells, there is considerable personal contact between the user and the water. Some people may even wash their faces, hands and feet which is a common Indian custom. Guinea Worm disease is quite a public health problem in areas where step wells are in use. The open dug wells and step wells are a health hazard to the community.

**Tube Wells :**

Tube wells of moderate depth can serve as satisfactory sources of safe water supply in rural areas. Evidence gathered shows that it is practicable to obtain bacteriological standard of not more than 10 cliforms per 100 ml.

**Sanitary Well :**

A sanitary well is one which is properly located, well constructed and protected against contamination with a view to yield a supply of safe water. The following points should be taken into consideration while construction sanitary wells.

**Water Pollution :**

Water is never Pure in a chemical sense. It contains various kinds of impurities such as dust particles, dissolved gases (Hydrogen, sulphide, carbon-dioxide, nitrogen, ammonia, oxygen) dissolved minerals (salts of calcium, magnesium, sodium); microscopic plants and animals; suspended impurities (clay, mud, silt, sand) and bacteria. These are “natural impurities” derived from the atmosphere catchment are and soil.

A more serious aspect of water pollution is that caused by (a) sewage (b) industrial and trade waste and (c) drainage from agricultural areas. These are the result of human activity, urbanization and industrialization.

**Purification of Water :**

Purification of water is of great importance in preventive medicine. It may be considered under two heading : 1. Purification of Water on a Large Scale and 2. Purification of Water on a Small Scale

**Air Pollution**

The immediate environment of man comprises of air on which depends all forms of life. A part from supplying the life-giving oxygen, air and atmospheric conditions serve several functions. The human body is cooled by the air contact; the special senses of hearing and smell function through the air-transmitted stimuli; disease agents may be conveyed by air. Pollution of air by dust, smoke, toxic gases and chemical vapours has resulted in sickness and death. Man’s adventure into outer space has broadened our concept of air environment. Truly speaking, there has never been pure air. Foreign substances have been present in the air at all time and tall places. The term air pollution is therefore applied when there is an excessive concentration of foreign matter in the outdoor atmosphere which is harmful to man or his environment. Air pollution is a growing menace to health throughout the world.

**Sources :**

There are three major sources of air pollution throughout the world

**Industrial Processes :**

In recent years, many types of industries have sprung up – chemical industries, metallurgical industries, oil refineries, fertilizer factories etc. All these have contributed to air pollution.

**Combustion :**

Industrial and domestic combustion of coal, oil and other fuel is another sources of smoke, dust and sulphur oxide.

**Motor Vehicles :**

Motor vehicles are considered the main sources of air pollution. Motor vehicles contribute to air pollution by emitting hydrocarbons, carbon monoxide, lead, nitrogen and other matter. In strong sunlight certain of these hydrocarbons and oxides of nitrogen may be converted in the atmosphere into a “Photo-chemical” pollutant of oxidising nature. In addition,

diesel engines, when misused or badly adjusted, are capable of emitting black sooke and malodorous fumes.

**Health and Air Pollution**

**Immediate Effects :** Epidemiological studies have shown that a sudden increase in air pollution has often been associated with immediate increase in mortality and morbidity. The symptoms are usually referable to the respiratory system. Even a small increase in air pollution has been shown to be accompanied by a small but definite increase in morbidity.

**Delayed Effects :** The diseases currently suspected of being casually related to air pollution are chronic bronchitis and primary lung cancer.

**Plants and animals :**

Plants are very sensitive to sulphur, dioxide, florine compounds, smog, etc. Spotting and burning of leaves, destruction of crops, and retarded growth of plants have been observed. Fluorides are very toxic to animals. Cattle suffer by eating foliage contaminated with fluorides.

**Social and Economic Aspects :**

These are due to impairment of human, plant and animal health; cost of cleaning and repairing unpleasant odours; cost of research and expenses due to the adoption of technical measures to control pollution.

The author has conducted field surveys to assess the status of sanitation environment in Rajasthan which as given in Table-6.1. which deals about the presentation of informations of the different Social classes and presence of their sanitation facilities in Rajasthan. Further in this context the study revealed that broad sense there are three social classes viz; High, Medium, Low. It is very interesting to mention here that ‘high social class’ has separate latrines of flush system (100 percent) where as ‘low social class’ has no such kind of facility but 20 percent Kacchi traditional latrines and 80 percent people of the low social class use the ‘Night-soil Areas’ which have location near by their settlement areas, whether it may be of village or the town periphery. The details of sanitation facilities are well shown in the Table-1.1. which illustrates that the 50 percent population of study area has no satisfactory sanitation environmental aspect as far as the Health environment of the people of the Rajasthan is concerned.

**Table: 1.1 Social Classes and their Sanitation facilities**

Sr. No.	Social Class	Kind and availability of Latrine			Percentage
		Separate Latrine (Flush System)	Kachhi Traditional Latrine	Use of Night Soil Areas	
01	High	100	-	-	100
02	Medium	50	30	20	100
03	Low	-	20	80	100
	Total	150	50	100	300
	Percentage	50	17	33	100

Source : Based on Field Surveys.

The condition has reached such kind of adverse position that the Rajasthan has proportion of the 63.11 percent slums population to the total population of the urban, it is an alarming issue which is a matter to think for the society and people of the city itself. It is all due to the speedy increasement of the water (water and waste disposal) and air (dust noise) polluted areas in the urban sectors of Rajasthan. The most difficult problem to tackle in this country as well as in our study area is perhaps the environmental sanitation problem, which is multifaceted and multifactorial.



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