

## **ENVIRONMENTAL SANITATION IN PARTS OF HIMACHAL PRADESH: TRADITIONAL WATER HARVESTING VERSUS CURRENT WATER ISSUES**

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### **ABSTRACT**

*Water shortages are a grave reality of the 21st Century. Water, the basic survival aspect of human, animal and plant life has come under threat due to a number of reasons such as over utilization, rampant wastage, drying up of natural resources, and the worst being the contamination of ground water. The receding water table and the growing burden of untreated sewerage are realities that are threatening the pristine environment of several geographical niches. Hamirpur and Solan Districts, located in Himachal Pradesh, constitute a niche environment that is rapidly showing signs of environmental degradation because of the lack of adequate sanitation practices at the individual, community and municipal levels. The management of solid waste by the Municipal Corporation as also the people of Hamirpur leaves much to be desired. This paper examines the current situation mainly in Hamirpur and Solan Districts in terms of water conservation and use, in addition to solid waste management and prevention of contamination of the environment.*

**Keywords:** *Water, Sanitation, Environment, Waste, Contamination, Prevention, Management*

### **INTRODUCTION**

Environmental sanitation is vital to health, child development and social and economic progress and in its absence, it is not possible to fulfil child rights, and good physical, mental and social well-being is unachievable (WHO and UNICEF, 2020). In 2015, the general assembly of the United Nations recognized Sanitation as a discrete right. To protect health and environment, everybody requires sanitation services that prevent exposure to unmanaged wastewater and harmful, unmanaged waste. In recent years, India, along with some other countries such as Ethiopia and Nepal, have dramatically reduced open defecation and made progress towards universal access to basic sanitation (WHO and UNICEF, 2020). This has been possible due to strong political will, with government playing an important role in developing and adopting policies and

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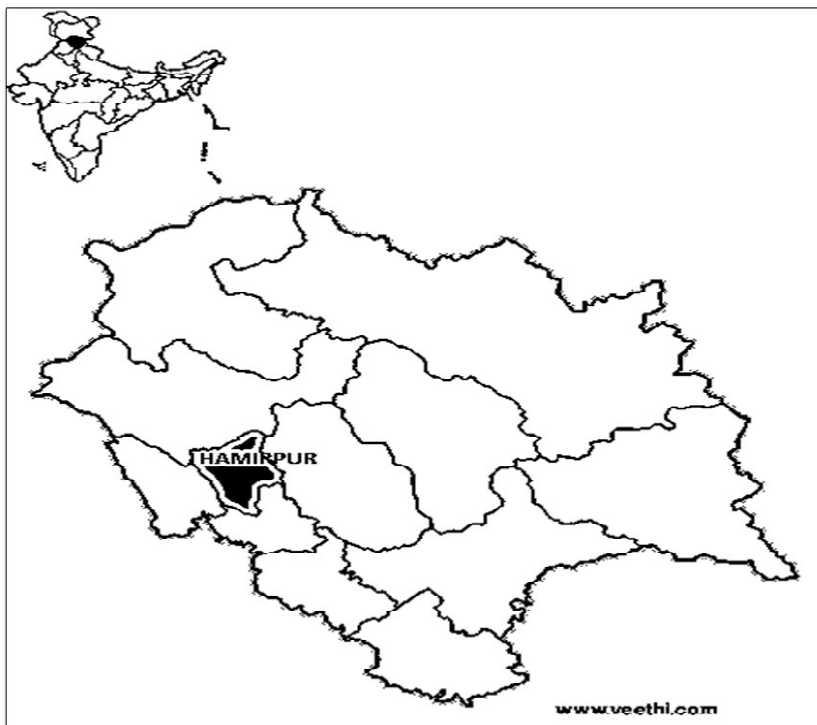
plans, marshaling investment and galvanizing widespread people's participation. However, it is a continuous process and much remains to be done before the goal of sanitation for all is achieved. It is important to continuously monitor progress and regularly generate data. According to WHO and UNICEF (2020), reliable, consistent and, whenever possible, disaggregated data are essential not only for policymaking, decision-making, and well-targeted investments but also for course corrections. This paper deals with the environmental sanitation in Hamirpur District of Himachal Pradesh with respect to traditional water harvesting and current water issues.

### **General Aspects of Hamirpur District**

Hamirpur District is a hilly region located in the south-western part of Himachal Pradesh State and is situated between 76° 18' to 76° 44' East Longitudes and 31° 25' to 31° 52' North Latitude (Figure-1). The district has a population of 4,54,768 people and a population density of 407 people per square kilometer, according to the 2011 census. The male and female population of the district is 2,17,070 and 2,37,698, respectively, with a sex ratio of 1,095. Approximately 24% of the district's residents are members of the Schedule Castes, and only 0.67% are members of the Scheduled Tribes. In total, there are three zones within Hamirpur (Hamirpur, Badsar, and Nadaun) and five tehsils within the district (Hamirpur, Badsar, Bhoranj, Nadaun, and Sujampur-Tira). The district is broken up into five distinct blocks. Hamirpur Town is the headquarters of the district. Situated at up to 1100 m above sea level, most of the Hamirpur land is covered by shrub forests or grassland with '*Chir*' trees. The people of the district are primarily engaged in farming as their source of income.

### **Exploring Water Wealth of Hamirpur**

Located in the Changer Belt, Hamirpur is one of the most water-starved districts in the state and this region of Himachal Pradesh is plagued by extreme drought. Springs, percolations, and step and stream wells are the primary sources of drinking water for the population. These traditional water-harvesting structures, known as 'Khatris', can be found in and around the Sujampur, Sachui, Patlandar, and Ahwa Devi areas of the district. Conglomerate terrain is used to build 'Khatris', which store rainwater and seepage water underground for domestic use during dry periods. 'Talavs', or rainwater tanks, are still used for traditional water harvesting methods like collecting rainwater on roofs and storing it in tanks or pounds at ground level.

**Figure-1: Location of Hamirpur District in Himachal Pradesh**

(Source: <https://www.veethi.com/places/himachal-pradesh-hamirpur-district-11.htm>)

In the district, the Central Ground Water Board (CCWB, 2013) has conducted hydro-geological studies and groundwater exploration. All along the valley fills, exploration drilling has been done in the Hamirpur District. Ten boreholes have been drilled as part of the ground water exploration process, with depths ranging from 40 metres at Sachuhi to as much as 100 metres at Chinjiani. Discharge varies from 20 lpm at Badehar to 1078 lpm at Harmandir, and the depth to the static water level ranges from 1.23 to 9.60 meters. The entire exercise has been undertaken to evaluate alternative sources of pure, unadulterated drinking water to supplement the already dwindling supply.

The district's three main seasons—winter, which lasts from October to March, summer, which lasts from April to June, and monsoon, which lasts from July to September—can be broken down into separate categories based on the climate. Between the months of July and August, the district receives the majority of its moderately intense rainfall. Averaging 1,340.72 mm per year, the district receives 82 percent of its rainfall between June and September.

Being a hilly and uneven region, the surface height in the district's northernmost region ranges from 400 to 600 m above sea level along the Beas River Valley and in the lower reaches of Kunah 'Khad'. A deep gorge and gully are formed in the district's Northeast. There are large river valleys in the Bhorang- Jahu-Dhankar regions of the district's southern portion, primarily

along the Sukar and Sir 'Khad'. While the ground typically slopes South in the Sutlej River drainage basin, it typically slopes North in the Beas River drainage basin.

Pollution of natural resources is one of the biggest problems with the way people live today. The world, as a whole, has trouble getting rid of its trash, but India has a wide range of problems. Even though hygiene and sanitation are big problems in many places, different areas have different ways of keeping the environment stable. This can be seen in the case of Hamirpur but for how long, remains to be assessed and observed over time.

### **Health-Sanitation-Environment Equation**

The safest way to improve health is through well-maintained sanitation, which prevents people from coming into direct contact with hazardous waste. The local governance probably treats and disposes-off sewage or wastewater. Health may be negatively impacted by human, animal, solid, industrial, and agricultural waste as well as domestic wastewater (including sewage, sullage, and grey water). Sanitation typically entails having access to and utilizing resources and services that facilitate the secure disposal of urine and faeces (Dobe *et al.*, 2011; WHO, 2018).

Controlling “everything in a person’s physical environment that hurts or could hurt his physical development, health, or ability to live” is what environmental sanitation is all about (Menzies, 1951). It is a plan of action with the goals of improving the quality of the environment and lowering the incidence of various diseases. Sanitation of the environment entails not only the management of municipal solid waste and industrial waste but also the regulation of pollution and noise levels.

There have been a few reported alleged instances of pollution-linked illnesses. In December 2021, there were reports that an e-waste treatment plant in Majra Village, Himachal Pradesh, polluted the groundwater, which caused illness in both people and animals. It is highly likely that the pollution originated from a solid waste management plant in Majra. However, officials at the plant asserted that there was no such contamination. Due conflicting arguments, it is important to conduct an in-depth to ascertain the situation. Nevertheless, it is essential to drive home the point that the rivers in Himachal Pradesh are extremely prone to contamination due to the dumping of all kinds of solid waste or trash in them.

Kajal (2021) reported the case of Karmo Devi, a resident of Majra Village in Nalagarh, which is the largest industrial area in Himachal Pradesh, who dug a well in order to obtain drinking water approximately twenty years ago. She and her family have used the well as their primary source of drinking water for the past twenty years. But just recently, when one of her milch animals passed away, suddenly she became suspicious that the water in the well had been tainted as “the colour of the water had changed to a dark grey”. She claims that

the Shivalik Solid Waste Management Plant (SSWMP) is to blame for the contamination of the water. She claims that many cattle have perished as a result of the contaminated water, and that even the villagers have fallen victim to a number of serious diseases. Approximately fifteen years ago, the Solid Waste Management and Treatment Project (SSWMP) was established in Majra for the purpose of processing solid waste generated by a variety of industries located within the state.

Explaining the viewpoint further, the inhabitants stated “We did not know that hazardous chemical solid toxic waste from the various factories in Himachal Pradesh was to be brought to this plant until after it was built, and we did not know that this plant was responsible for treating this solid waste until after the plant was built. “We realized it later that the waste management plant had contaminated the groundwater by dumping the waste into the ground instead of treating it,” said Balvinder Kaur. “When the cattle mysteriously started dying and the villagers fell ill with various diseases, we realized that the waste management plant had contaminated the groundwater.”

### **Growing Volume of Industrial and Domestic Waste**

Over the course of the last decade, the government of Himachal Pradesh has been very active in the process of giving its approval to various industries located within the state. There are 41 industrial areas and 15 industrial estates that have been developed by the government of Himachal Pradesh to provide entrepreneurs with the necessary infrastructure support. In terms of the amount of investments brought in, the districts of Solan, Sirmour, Kangra, and Una are in the lead.

The Economic Survey for 2019-20 estimates that there are 54,310 active units located within the State. There are 140 large industrial units among these, and 628 units that are considered to be medium-scale industrial units. When it comes to the establishment of businesses, many people consider the Solan District to be the most developed district in the entire state. In Solan, there are 15 industrial parks, which are home to a total of 5,331 small-scale businesses, 240 medium-sized businesses, and 106 large-scale businesses.

### **Rivers as Waste Dumping Grounds**

A stretch of the river between Nalagarh and Solan was found to be the most polluted in the state of Himachal Pradesh in 2018, according to the Central Pollution Control Board’s assessment of 351 river segments (Kajal, 2021). They discovered that there was severe pollution in the Beas, Sukhana, Markanda, Sirsa, Ashwani, Giri, and Pabbar Rivers.

While the State of Himachal Pradesh struggles to handle the solid waste produced by the State’s current industries, eight industrial projects in Solan have received single-window approval. Additionally, the State’s Nalagarh

industrial township will receive a “Medical Device Park” worth Rs. 5,000 crore (Rs. 50 billion) from the government. From the economic, livelihoods and economy point of view, this is the very positive input for the State. However, in terms of environmental depletion the industrial waste generation angle, it may prove to be a potentially severe environmental problem.

### **The Indian Scenario vs World Aspirations on Sanitation**

As of January 2, 2022, there were over 5.5 crore households that had access to tap water, and six States and two Union Territories had reached the coveted status of having 100% of their residents having access to tap water (Bhatia and Bhaskar, 2022). Since the Swachh Bharat Mission began on October 2, 2014, more than 10.86 billion toilets have been built in rural India. Phase II of the Swachh Bharat Mission will spend a total of Rs. 1,40,881 crore on managing solid and liquid waste and making ODF obsolete. According to the results of NFHS-5, the number of people living in homes with better sanitation has gone from 48.5% in 2015–16 to 70.2% in 2019–21.

The climate will continue to be critical to achieving India’s goal of having net zero carbon emissions by 2070, according to the Economic Survey. The NITI Aayog, SDG (Sustainable Development Goals) and the India Index show that India’s overall performance has improved from a score of 60 in 2019-20 to 66 in 2020-21, according to the economic survey. Nevertheless, there is much more to be done.

To achieve social and economic progress, as well as to ensure the health and safety of the population at large, sanitation is an essential component of the public health mechanisms offered by the government to its people. In 2015, the United Nations General Assembly recognized sanitation as a distinct human right. Goal 6.2 of the Sustainable Development Goals (SDGs) reads, “By 2030, achieve access to adequate and equitable sanitation and hygiene for all, with particular attention to the needs of women and girls, as well as those in vulnerable situations.” Member states had agreed to the 2030 Agenda for Sustainable Development in 2015.

The world’s goal of providing sanitation to everyone by 2030 is being met at an alarmingly slow pace. There are roughly seven years left until 2030 to meet the sanitation goals as set under the Sustainable Development Goals (SDGs). The rate at which sanitation coverage is increasing, it is essential that the efforts must quadruple. If current trends continue, universal access to clean water and sanitation will continue to be under achieved until well into the twenty-second century.

### **Prospective Disease Burden and Progress on Sanitation in Hamirpur and Solan Areas**

Preliminary observations based on a small sample were published in an earlier

report (Thakur and Gaur, 2020). The main diseases and aspects related to environmental sanitation of the area under investigation can be summarized as follows:

- **Cholera:** Elimination of cholera in 20 countries with recurring outbreaks and no more uncontrolled outbreaks in vulnerable settings. In India it is a recurrent and rampant problem and the areas of Hamirpur and Solan are no exception.
- **Intestinal Worms:** While regular drug administration keeps infections at bay, people continue to become infected in areas where open defecation and the use of untreated wastewater for irrigation are practiced. Hamirpur and Solan are both areas where this is a common place occurrence for residents and visitors alike.
- **Nutrition:** Repeated diarrhoea caused by poor sanitation will prevent people, particularly children, from absorbing the nutrients in food required to grow and thrive. This fact is borne out among the children of Hamirpur and Solan.
- **Antimicrobial Resistance (AMR):** Each year, hundreds of millions of antimicrobial doses are used to treat infections that could have been avoided with better sanitation. AMR will continue to spread as a result of wastewater contaminated with resistant bacteria. This was experienced in Hamirpur and Solan both though the reported frequency was not conformed and can be done through further empirical research.
- **Food Safety:** Growing water scarcity and urbanization will increase demand for water and nutrients from peri-urban farms. Unsafe wastewater and sludge disposal tends to result in outbreaks and an increase in chronic food borne diseases. Several cases of food poisoning and gastro enteritis are reported every year among the residents of Hamirpur and Solan areas.
- **Water and sanitation are basic human rights:** Everyone needs sanitation services to keep themselves and the environment safe from disease. The residents and visitors coming to Hamirpur and Solan were being exposed to poor sanitation services if the disease burden was steadily increasing. It should be courted. Securing sanitation as a basic public good is essential to the well-being of the general public and the advancement of society. Therefore, adequate measures need to be taken to ensure a disease-free, healthy well served population in terms of public health and sanitation.

Sanitation (State of WSR, 2020) problems have a cascading effect on many aspects of human health. For children and the elderly, it may cause diarrhoea and worm infections. People, who are most vulnerable and disadvantaged, such as women and people with disabilities, are disproportionately affected by poor

sanitation. Sanitation workers face increased health risks, social stigma, and economic marginalization when working in an unsanitary and unregulated environment.

Everyone, even those who have access to adequate sanitation facilities at home, can be negatively affected by poor sanitation in the community. Cleanliness has a heavy price tag in terms of lost wages and educational opportunities, as well as preventable medical expenses and lost income. The biggest and most irreversible cost is the pollution damage done to the environment and its recurrent depletion. No doubt it is expensive to provide safe sanitation coverage for everyone, but the alternative is even more costly. People's health and well-being, as well as the environments, are all negatively impacted by poor sanitation.

Fewer than a minority (on an individual level) have the adequate resources to implement sanitation policies and plans effectively; however, most countries have sanitation plans and policies in place. There are, however, several, lacunae. There is a need to change the basic mindset towards hygiene, sanitation and water conservation. In various areas the urban sanitation policies and plans fail to address the critical issues of sludge management. Regulators frequently lack the resources and staff necessary to carry out their duties of regulation enforcement and monitoring. In many cases, existing tariffs and user fees do not adequately cover the costs of operating and maintaining the infrastructure. In response to the SDG directive to "leave no one behind," more than two-thirds of countries say they have policies in place to provide sanitation to the poorest citizens. In reality, only a quarter of these can barely pay for these programmes. The evaluation of Hamirpur and Solan shows how these two areas are steadily progressing towards disaster if ameliorative steps are not taken to restore the hill environment to its beauty and health giving nature rapidly. Steps must be taken to upgrade the sanitation facilities that have been compromised due to the rapid influx of industrial and tourism influx in the past few decades.

It is expected that five out of every ten people will have access to safe sanitation services by 2030. By 2030, there will be 1.7 billion more people on the planet, but only 2.4 billion of them will have access to safe sanitation services, like a minimal facility for treating waste off-site or disposing of it on-site.

Of the 1.7 billion people without access to basic sanitation services in 2020, there were 494 million people used no toilets and defecated in the open. In 55 countries, more than 5% of the global population were still defecating in the open by 2020. The majority of defecation occurs in Sub-Saharan Africa, but it also occurs frequently in Central and Southern Asia, as well as Oceania. In 17 nations, fewer people will be defecating in public by the year 2020. By 2030, if current trends continue, open defecation will be eradicated globally and in the majority of SDG regions.

As things stand about half (1.9 billion) of the 3.6 billion people who lacked



access to safe and dependable services in 2020 did so for the bare necessities. For 580 million people, who shared them with other households, even the most basic sanitation facilities were available, while 616 million people relied on “unimproved facilities.” The data showed that two-thirds of rural residents still lacked access to even the most fundamental services. Sanitation coverage is almost universal in the developed nations, but it varies greatly in developing nations. By 2020, 62 nations had universal access to essential services, including eight nations with universal access to well-managed services (90 percent or higher). In 48 countries, fewer than half of the population has managed services safely. It emerges that much needs to be done on the environmental sanitation front and concerted efforts have to increase pace substantially to achieve the goals set by the government.

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