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Water And Sanitation Impact in the Human Health of Nepal: A Review

Mayanath Ghimire
Post Doctorate, Research Head, Gaurishankar Campus, Nijgadh, Bara

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Email
mayanathghimire@gmail.com

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ABSTRACT

This research investigates the influence of water supply and sanitation on human health in Nepal using a systematic evaluation and scientific synthesis of pertinent material. The results show that protecting public health requires good wastewater treatment, efficient pumping systems, safe drinking water, and good water, sanitation, and hygiene (WASH) practices. However, developing countries like Nepal still have problems because they don't have enough resources or infrastructure. Nepal's laws and policies encourage the development of WASH. For example, 99.7% of families have toilet facilities, and 95.7% wash their hands with soap after handling trash. Most rural and peri-urban populations get their water via community-managed systems. Even though there has been a lot of development, there are still gaps in services. For example, 7.3% of hospitals and 23% of schools do not have access to water. The country has 17,232 health facilities and 155,650 health workers, including 34,910 doctors, 82,471 nurses, 37,420 auxiliary nurse midwives, and 849 foreign nurses. Income and education are two socioeconomic factors that have a big effect on WASH practices and health outcomes. Environmental stresses, like groundwater depletion in the Terai region and drying of hill-region springs, make water scarcity worse, make systems less reliable, and raise the risk of waterborne diseases like diarrhea. To lower disease rates and improve public health in Nepal, it is important to strengthen WASH infrastructure, raise community knowledge, and carry out targeted interventions in rural areas and schools.

Keywords: disease, human health, impact, supply system, use, water and sanitation

Introduction

Nepal has established a comprehensive legal and policy framework for the Water, Sanitation, and Hygiene (WASH) sector. This includes constitutional recognition of clean water, sanitation, and a fresh environment as fundamental rights, as well as the introduction of the Water Supply and Sanitation Act, 2022 and National Water Supply, Sanitation and Hygiene Policy, 2023. These policies are expected to promote integrated planning, community participation, regulatory oversight and private sector involvement. Local Governance Operation Act, 2017 empowers local governments in managing WASH programs, while the Nepal Water Supply Corporation (NWSC) Act, 1989 and the Water Supply Management Board (WSMB) Act, 2006 outline responsibilities for the NWSC and WSMB. The predominant service model in the water sector is community-based, with exceptions like five WSMBs, 23 NWSC branches, KUKL, and few boards in rural municipalities.

However, sanitation services are in growing stage and still require due attention in categorizing the service models. The country has introduced National Drinking Water Quality Standards, 2022 and Domestic Wastewater Effluent Standards, 2023 to protect public health and environment. The National Determined Contributions (NDC) and National Adaptation Plan (NAP) have integrated WASH goals, marking the inception of a climate-oriented approach in WASH program interventions (Government of Nepal, Ministry of Water supply, 2024).

The availability, change, and longevity outcomes were explained by five mechanisms: (1) accountability (policies and procedures to hold communities accountable for their actions and the results of an intervention); (2) diffusion (the spread of an idea or behavior by innovators over time through communication among members of a community); (3) market (the interaction between supply and demand of a WASH service or resource); (4) ownership (a sense of possession and control of the WASH service or resource); and (5) shame (a feeling of disgust in one's behavior). Community leadership and communication, technical expertise, resource access and reliance, committee activities like rules and management plans, location, and the degree of community involvement were among the contextual elements found. (Nelson et al., 2021).

Nepal is a multi-ethnic country with cultural diversity according to ethnicity. Culturally rich, the Tharu ethnicity is the fourth largest ethnic group. Sanitation and hygiene are integral parts of their culture. Water, sanitation, and hygiene (WASH) are fundamental for everyone. This study aims to identify the WASH practices and situation of diarrhoeal diseases among the Tharu ethnic group in the Chitwan district of Nepal. Nearly all (99.7%) households have a toilet (92.8% water seal). The respondents wash their hands with soap before eating food and after defecation. Almost all (95.7%) wash their hands with soap after cleaning yards, 92.5 percent after cleaning the child's bottom, 91.5 percent after touching cow dung, 89.9 percent after agricultural work, 73.1 percent after feeding the child, and 90.7 percent after cleaning the toilet (Paudel & Devkota, 2024).

A basic human right is to have access to safe and clean drinking water, especially in developing nations with inadequate centralized infrastructure. In Nepal, community-managed water supply systems are essential for supplying rural and periurban areas with water services (Guragain & Celestin, 2025).

In rural areas, alternative healthcare providers and traditional healers might also be more accessible. Particularly among rural populations in Nepal, people prefer to seek treatment from traditional healers rather than visiting hospitals and health posts. According to Nepal's registration, there are a total of 17232 health facilities and 155650 health personnel (doctors 34910, nurses 82471, ANM 37420, and foreign nurses 849) (Ghimire & Mishra, 2025).

Problem Statement

Maintenance issues, contamination risks, and capacity constraints are all inherent problems with onsite sanitation systems. Due to population growth, urbanization has resulted in a significant increase in wastewater generation, aggravating Nepal's wastewater treatment problems and impeding access to sanitary facilities. The discharge of untreated waste water into water bodies, poorly managed sewage systems, and a lack of effective treatment systems are just a few of the wastewater treatment issues Nepal currently faces. The problems associated with uncontrolled waste disposal are made worse by the addition of freshly produced sewage to the already unmanaged systems, which seriously deteriorates public health and the environment (Karki et al., 2024).

Water supply issues include infrastructure damage from flooding, the loss of water sources as a result of decreasing rainfall and rising demand, and variations in the water quality of water sources and within water distribution. Reduced carrying capacity of waters receiving wastewater and damage and loss of services from floods are examples of sanitation concerns.

Public health depends on the choice of wastewater treatment technologies, increased pumping efficiency, and access to clean water, proper sanitation, and hygiene (WASH), but many communities in developing nations continue to face major obstacles.

The results of the financial performance show that the water accounting system has different tariffs: NRW is 62.31%, average tariff is NRs 8.46/m3, personnel cost is NRs 65.88%, unit production cost is NRs 6.41 per 1000 liters, operating ratio is 5.8, accounts receivable equivalent is 1.02 months, revenue collection efficiency is 73.24%, five consecutive years are producing positive cash flow, and the payback period for reservoir construction, including O & M costs were three years and four months for 15% NRW, 0% NRW, and 21.6% NRW, respectively (Mishra, 2019).

The steps that should be taken for a successful project commissioning have been used to compare the Pakali and Bharaul projects. Planning and pipe and instrumentation diagrams were found to be competent in both of the chosen projects. Regarding mechanical

none of the selected projects were judged competent after completion, pre-commissioning, commissioning, start-up, initial operation, and performance testing. Post-commissioning has not yet been completed because neither project has been turned over.

A management transfer procedure that includes calibrating and sterilizing the system, having the "water operator's standard" document in place, and training the office staff and members of the water user supply committee is advised for a successful commissioning (Mishra et al., 2023).

Research Objective

To review of community use water and sanitation impact in human health of rural people of Nepal.

Logical framework

Due to the water and sanitation (WASH) in rural area of Nepal human activities play great role for water and sanitation program. If community people adopted water cleaning and use safe drinking water they could not face stomach related diseases like Bacteria (worms and insects), diarrhoea and decentres. Next seeing normal but great problem is toilet use and hand-washing. Every home have attached or separate toilet, they use and wash their hand by soap and water it safe human health. This is normal in seeing but played great role to safe child, youth and elders of life rural people of Nepal. If those people have not toilet they do open defecation (ODF) it is very dangerous because it helps human make sick in community people of Nepal. The water and sanitation adverse effects is waterborne and communicable disease in community.

Methodology

The researcher examines the water and sanitation policies of the Nepali government. Research publications pertaining to the topic were examined and evaluated. The study employed the scientific review process, and the findings were integrated to address the impact of water and sanitation on human health. The impact of agricultural pesticides on the rural population's health in Nepal. To increase production, farmers use poison in their crops (fruits, vegetables, and grains). As advised by the technician, they were not allowed to use poison. Increased use of poison has a negative effect on people's health. In-depth archival analysis and an intensive review are two strategies that would be used during the scientific review. Depending on the type of data, both qualitative and quantitative research methods could be helpful.

Literature Review

In many parts of the world, flooding is becoming more frequent and severe due to the effects of climate change on precipitation patterns and events. Concerns about worsening floods interfering with households' access to safe sanitation are driving discussions on how to strengthen sanitation systems in low- and middle-income countries. Household sanitation system failures are greatly increased by exposure to

flooding, and there is a correlation between these failures and the standard of sanitation facility construction and upkeep. Following flood damage to household sanitation systems in Nepal, Ethiopia, and Uganda, open defecation was associated with living in rural areas, using subpar latrine slabs, and feeling uncomfortable using a neighbour's toilet (Kohlitz, et al., 2025).

Over the past 20 years, Nepal has significantly improved access to water, sanitation, and hygiene services. This has been made possible by the government's general emphasis on the sector and its leadership in WASH development, which has received catalytic support from international organizations, civil society, and WASH service users. This accomplishment has also been greatly aided by the mobilization of household-level investment and user participation in control and decision-making. Nepal has attained a remarkable nominal coverage of water and sanitation facilities across the nation as a result of the last 20 years of intense engagement. The country achieved the Open Defecation Free Status in September 2019, and the updated basic water supply coverage figure is more than 90% of the total population (Asia & the pasafic, 2020).

"Public use of water supply" refers to the use of water supplied to consumers from publicly connected faucets as well as the use of water supplies in public areas during emergencies, such as firefighting. "Water supply" refers to a clean, high-quality water supply that complies with the National Water Supply Quality Standard and is free of substances that are hazardous to human or animal health. "Domestic use" refers to the use of a water supply for drinking, hand, face, and clothing washing, bathing, cooking, feeding animals and livestock, kitchen gardening, toilets, and other comparable personal and domestic uses. "Water resource" refers to both surface and subsurface water resources, including rivers, streams, lakes, ponds, stone spouts (Dhungedhara), masonry wells, wells, and water sources (Government of Nepal, 2022).

It is anticipated that the risks of climate change and disasters will worsen, impacting both people and the environment and jeopardizing advancements in development. The increasing frequency and severity of drought, erosion, biodiversity loss, forest fires, and diseases pose a threat to Nepal's diverse ecosystems and natural capital, which are essential ecosystem services for the impoverished in remote areas. In 2020, severe monsoon floods and landslides destroyed numerous roads, displaced thousands of people, and claimed hundreds of lives. In a similar vein, the unusually heavy rains in western Nepal in October 2022 caused significant agricultural losses due to flooding and landslides throughout the nation, as well as numerous fatalities and missing persons, as well as damage to roads, bridges, hydropower plants, and other physical infrastructure (CDCC Consortium, Nepal, 2023).

The two main causes of death for children in low-income environments are respiratory tract infections and diarrhea. They are intimately linked to improved water, sanitation, and hygiene (WASH) access and utilization. Nevertheless, there isn't a high-quality systematic review that measures how improvements in WASH affect child mortality (Waddington H S, 2021).

People's capacity to work and make a living is consequently diminished by health effects. The primary health risks associated with climate change include direct mortality from natural disasters, particularly landslides and floods; increased vector-borne disease spread into previously uninfected highland areas as temperatures rise; and rising food and water insecurity, which impacts water contamination, the spread of waterborne diseases, and the risk of malnutrition (IFRC, 2021).

A lack of supportive policy environments and sufficient funding are obstacles to attaining and maintaining access to water, sanitation, hygiene, cleaning, and waste management (WASH) in healthcare facilities. There is little guidance on how to create budgets and policies to maintain WASH services, even though there are guidelines for evaluating needs and making preliminary

infrastructure improvements. In order to create a budget and an operations and maintenance policy for WASH in healthcare facilities in collaboration with the local government, we carried out costing and advocacy work in Thakurbaba municipality, Nepal. The bottom-up costing method is used to list the resources and associated costs required to provide basic WASH services. The municipality is currently promoting WASH in healthcare facilities at the national level, and results (Chettry, et al., 2024).

Prioritize gender equality and social inclusion (GESI) in national governance and policy. Due to systemic, informal power relationships based on caste, ethnicity, and gender that are ingrained in institutional structures and cultures, there has been a notable increase in the number of women representing local governance structures. These relationships continue to shape unequal gender power dynamics (Khadka et al., 2023).

In the Kathmandu Valley of Nepal, groundwater serves as the primary source of drinking water. In order to evaluate the groundwater quality of this valley's Lalitpur Metropolitan City (LMC), samples were taken from 35 shallow dug wells during the winter and post-monsoon seasons, and 16 parameters were analyzed: pH, TDS, EC, Na^+, K^+, Ca^{2+}, Mg^{2+}, Total hardness, Cl^-, HCO_3^-, NO_3^-, NH_4^+, Fe, PO_4^{3-}, SO_4^{2-} and Total Coliform. Seasonal and geographical differences in water quality have been identified through hydrochemical analysis and GIS-based mapping. In comparison to the post-monsoon samples, the winter samples had higher concentrations of the majority of the parameters. Anomalous water chemistry has been found by comparison with the WHO and NDWQS guidelines. Groundwater-hosting zones that were appropriate and inappropriate for irrigation and drinking were identified. Nevertheless, the existence of pathogens (Ghimire et al., 2023).

Wastewater effluent discharge has increased globally as a result of rapid urbanization. Despite Nepal's impressive wastewater management history, ongoing problems have impeded progress in this area. These issues include inadequate treatment infrastructure, inadequate sewer coverage, inadequate treatment and sludge disposal facilities, a lack of cohesive institutional frameworks, and a lack of thorough planning. With little access to seepage treatment facilities, over 85% of urban households in Nepal rely on on-site sanitation. The concentration of centralized treatment facilities in the capital city highlights the alarmingly low wastewater treatment to generation ratio. This low ratio highlights how inadequate the current wastewater system is and how the government's inexperienced methods contribute to the subpar sewerage facilities (Karki et al., 2024).

Roughly 95% of households had better access to water, 84% had better sanitary facilities, 81% had a designated area for hand washing, and 47% had soap and water. WASH was substantially correlated with ecology, wealth, and education (Dhital et al., 2022).

Just 35% of households have access to piped water; the remaining households rely on unreliable sources like rivers and wells, many of which are contaminated. Forty-two percent of households lack adequate sanitation facilities, and many continue to defecate in the open. The lack of regular hand washing with soap contributes to the high incidence of waterborne illnesses like typhoid and diarrhea, particularly during the monsoon season (Poudel, 2025).

A maximum of 28 and a minimum of 4 people shared a single toilet, and 81% of the HHs used shared restrooms. Additionally, 75% of the HHs said they occasionally had diarrheal infections. The Displaced Persons (DPs) Camp in Khalte-Rasuwa, Nepal, had inadequate sanitation services and only basic hygiene practices (Tamang et al., 2024).

For humans and all other forms of life on Earth to survive and be healthy, drinking water is essential. Serious illnesses like cholera, typhoid, diarrhea, and dysentery are highly likely to spread among people in the absence of drinkable water. 2.2 billion people worldwide still lack access to safely managed water services, despite notable advancements in community water schemes (Gautam & Dahal, 2020).

However, the government recently unveiled the National Water Resources Policy 2020, which aims "to sustainably conserve, manage, and to carry out multipurpose development of available water resources to contribute to the economic prosperity and social transformation of the country." Adopting the basin as a unit of water administration, it embraces IWRM principles and acknowledges the multi-sectorial aspects of water. It outlines the goals and methods for achieving them, with action plans defining each. These include the requirement that river basin plans be adopted in order to carry out water accounting allocation and auditing. It advocates for planning and management that is grounded in science and facts (ADPC, 2021).

Increased access to better drinking water and basic sanitation services was summarized by ADB. The National Urban Development Strategy 2017, which acknowledges the significance of small towns in the nation's economic development, was also in line with the project. Additionally, it backed the Fifteenth Plan (2020–2024) strategic plan of Nepal, which envisions clean, safe, easily accessible, and sustainable drinking water and sanitation services (ADB, 2022).

More emphasis is being placed on more adaptive management as the scope and complexity of the risks that climate change poses to water resources are better understood and documented. Despite the significance of drinking water and sanitation services for human health, relatively little focus has been given to how these threats will affect their management (Howard, 2016).

The National Adaptation Plan (NAP) of the Nepali government offers guidelines for incorporating adaptation considerations into programs, policies, and activities. Highly vulnerable areas for health, drinking water, and sanitation (HDWS): Sanitation, drinking water, and health in the hills: Karnali, Madhesh, and Sudurpaschim provinces. areas where the effects of climate change on this industry are most likely to occur by 2050. Sunsari, Dhankuta, Terhathum, Sankhuwasabha, Tanahu, Parbat, Syangja, Morang, Taplejung, Panchthar, Jhapa, and Ilam districts are among those in Nepal with health issues. Sanitation and drinking water in Madesh province. Its effects are Higher altitudes increase the risk of vector-borne illnesses like scrub typhus, dengue, and malaria. increased risk of water-borne illnesses following intense precipitation events, such as cholera and diarrhea. Malnutrition, food insecurity, non-communicable diseases, cardiovascular disease, and respiratory infections are all more common. Scarcity (Government of nepal MOFE, 2021).

The 2021 census shows that tap/piped water (inside and outside household premises combined) is the main source of drinking water for 57.0 percent of the total households (6,660,841). Other main sources of drinking water for households are well/hand pump 29.8%, jar/bottled water 4.6%, spout 3.9%, and uncovered well/kuwa 2.1%, and covered well/kuwa 1.5% and river/stream 0.4% of the total households. The 2011 census had shown that tap/piped water was the main source of drinking water for 47.8 percent of the total households (5,423,297) while tube well/hand pump was the main source of drinking for 35.1 percent of the total households (National statistics office, 2021).

Nearly all of Nepal's population (98%) has access to at least basic drinking water services, according to a USAID summary of household water, sanitation, and hygiene. Drinking water treatment Twenty-five percent of people drink water that has been properly treated (boiling, bleaching, filtering, and solar disinfection). Sanitation At least basic sanitation services are available to 73% of the population. Eighty-three percent of people live in homes that properly handle household waste. Hand washing: 27% of people have limited hand washing facilities, whereas 72% of people have basic hand washing facilities (Ministry of Health and Population of Nepal, 2022).

In Nepal's Terai region, bananas are grown commercially and in larger quantities. The more consistent and substantial advantage from September to February. During the winter,

Nepal imports more than 60-70% cheaper Indian products. Insecticides and pesticides are used seven to twenty-four times a day in the banana production area of Nijgadh. The benefits of banana farming are twice as great as those of sugarcane and grain crops. Poison degradation soil and reduced production after decays. It should be shown after a long time used effect and damage to human life also. It is needed to aware to Nijgadh area farmers in time otherwise great difficulties bear. Soon needed try to start organic production and supply in local, regional and central market of Nepal (Ghimire et al., 2024).

The children and parents of Chepang community to know their health status in comparison with other communities. Chepang is an indigenous ethnic group living in Central and Southern Nepal especially in Chitawan, Gorkha and Dhading districts and also known as one of the isolated tribal groups of Nepal. They have their own language known as Chepang but is called Chyo-bang by the people themselves. The Chepang settlement is often on very steep land, unfertile and not easily accessible. Chepang are found back in health seeking practices than the other communities. Cent percent mother had reported that they had given the birth of 1st baby before 20 years of her age. Though, health status of Chepang children found better than other communities' children (Ghimire, 2014).

The foreign employment as Returnee Workers attributes such as entrepreneurship skills, employment opportunities, and leadership skills, level of accountability and responsibility, and collaboration in Entrepreneurship Development whether Returnee Workers attributes has effect on the level of Entrepreneur among returnee participants (Mishra et al., 2023).

Particularly with regard to floods, landslides, drought, forest fires, and hot and cold waves of viral infections every year, Nepal is a very disaster-prone nation due to the high summer precipitation rates. More landslides occur in Nepal's river hills and Terai region throughout the summer (June to September) due to the heavy monsoonal rain that falls during this time. In the up-stem region of rivers, flooding is more likely to occur, and the down-stem region of rivers has a dipping issue. Sedimentation harms homes, agriculture, and human life all at once. The research aims to distinguish nutritional difference among under-five children with and without flood through Weight, Height and Mid-Upper Arm Circumference (MUAC). The children are more malnourished than children in non-flood-affected in the sane social areas. In the Karnali River, unthinkable floods stop human life. During the flooding duration, almost all houses leave their homes for 1 to 4 weeks and stay as refuse in community buildings (community homes, schools, and Godam buildings). According to the Karnali River floods, this condition occurs 1–3 times per year. After every flooding, it takes huge cost for the maintenance of their home, toilet, and hand pump to get back to their normal life (Ghimire et al., 2023).

The impact of poultry keeping entrepreneurship on employment and income among residents of the mid-Terai region of Nepal. The poultry production is a highly profitable venture in the mid-Terai region. Broiler farming, in particular, has been identified as a lucrative short-term farming activity in rural areas. The study found that managing 100 broiler poultry can generate an annual income of approximately NPR 800,000 to NPR 900,000, with a net profit of NPR 320,000. Additionally, poultry farming provides employment opportunities for two individuals (Timilsina et al., 2014).

Nepal is a highly disaster-prone country, experiencing earthquakes, floods, landslides, drought, hot and cold waves, and vector-borne diseases on a regular basis. Monsoonal floods and landslides affect the most vulnerable communities in the hills and plains every year. The paper is aimed to review the effects of nutrition during floods on children. The floods affected children, mothers' and elders in Nepal. June to September is the main monsoon month in Nepal. Floods damage houses, foods, agricultural crops, livestock, poultry, and

cloth. Floods affect the Terai area of Nepal. There is found floods affected 3-5 years children in Bhutan, Bangladesh, Bhutan, India, and Nepal (Ghimire et al., 2023).

The study is assess and to compare child nourishment in the communities affected by flood and non-affected households based on perception. Both areas found malnutrition, but the flood-affected area was more affected than the non-flood area. Every year, the deepest river in Nepal, Karnali, is affected one to three times annually. Its impact on society is to stay in safe places like community centers, school buildings, and Godam for one to four weeks (7 days to 30 days) annually (Ghimire et al., 2023).

The current snacking habits of community schoolchildren and the sustainable, affordable, and impactful impact of snacks on dietary habits and health status. The School Day Snacks aid in the attachment of children to school, enrolment, and regular attendance. Many parents want to send their children to school without daytime snacks. It is seeing hunger as an opportunity to access education for deserving children.

Mid-day meals are problems in central hills and perhaps elsewhere to provide schoolchildren with nutrition as well. Similarly, to raise nutrition awareness and the availability of nutrient rich foods for children. Added fruits and vegetables for health development, growth, and detection of disease for children.

Junk food consumption among adolescent students is remarkably high in both public and private schools. According to the Day Snacks Management Guidelines 2020, each kid should consume 150–200 grams of cereals, gedagudi (peas, grains, pulses, etc.), green vegetables, and fruits. Also needed were 50–60 grams of animal-related protein foods. It is said in Nepal that ''Harek bar Khana char'' (every four different types of foods like rice, vegetables, animal related foods, and pulses) must (Ghimire et al. 2024).

The current snacking habits of community school children's dietary habits and health status. There were severe wasting total (1) 4.5%, Moderate wasting (1) 4.5% and normal (20) 90.9% in Mangal Secondary School, Kirtipur -10, Kirtipur, Kathmandu whereas Moderate Wasting was (3) 11.1%, and normal (24) 88.9% were in Mahendra Adarsha Secondary School. At Mangal Secondary School, Kirtipur -10, Kirtipur, Kathmandu, the prevalence of stunting by age based on height-for-age Z-score showed severe stunting in children aged 42-53 months at 9.1%, moderate stunting at 13.6%, and normal height at 77.3%. Similarly, at Mahendra Adarsha Secondary School, Mahalaxmi -4, Imadol, Lalitpur, the total prevalence showed moderate stunting in children aged 42-53 months at 33.3% and normal height at 66.7%. Mid Upper Arm Circumference (MUAC) is used for emergency and screening purposes to assess the nutritional status of children (Ghimire et al., 2024).

Health check-up during pregnancy and after pregnancy is a must because of the critical health status of the mother and baby. The study identifies the health seeking behavior of mothers of Chepang and Non-Chepang communities of Makawanpur and Chitwan district of Nepal regarding the ANC and PNC check-up. The study was cross sectional descriptive design. The result found that Non-Chepang community was found more aware and better practice of health check-up than Chepang communities in both districts. Nepal Government should focus on Chepang or similar types of marginalized and backward communities to increase their access on health services as well as concerned authorities should be responsible to address their problem which become as barrier to change their health seeking behaviour (Ghimire & Maharjan, 2014).

This empirical review delves into the intricate relationship between Human Resource Development (HRD) practices and employee commitment within the specific context of Nepalese organizations, f illing a significant gap in the current literature. In the conceptual framework guiding this exploration, employee commitment assumes the role of the dependent variable, subject

to influence from demographic factors acting as moderating variables. The independent variables encompass training and development, career development, and organizational development. This framework serves as a structured lens through which to analyze and comprehend the complex interplay between HRD practices and employee commitment within the distinct organizational landscape of Nepal (Thakur, 2023).

Results and Discussion

Findings

The water supply and sanitation act of 2022 and the national water supply, sanitation, and hygiene policy of 2023 both recognize clean water, sanitation, and a fresh environment as fundamental rights under the Nepali constitution.

Accountability, diffusion, market, ownership, and shame are Nepal's five outsourcing mechanisms.

Nearly every home (99.7%) has a toilet (92.8% water seal). Before eating and after defecating, the respondents wash their hands with soap. Nearly all (95.7%) wash their hands with soap following yard cleaning, 92.5% following child bottom cleaning, 91.5% following contact with cow dung, 89.9% following agricultural work, 73.1% following child feeding, and 90.7% following toilet cleaning. 23% of schools and 7.3% of hospitals lacked water facilities in 2020.

Sanitation services are expanding and still need careful consideration when classifying service models. To safeguard the environment and public health, the nation established the Domestic Wastewater Effluent Standards in 2023 and the National Drinking Water Quality Standards in 2022.

Contextual factors included community leadership and communication, technical proficiency, resource access and reliance, committee activities such as rules and management plans, location, and the level of community involvement.

Access to clean, safe drinking water is a fundamental human right, particularly in developing countries with poor centralized infrastructure. In Nepal, providing water services to rural and periurban areas depends on community-managed water supply systems.

Nepal's access to water, sanitation, and hygiene services has greatly improved over the last 20 years.

"Public use of water supply" includes both the use of water supplies in public spaces during emergencies, like fighting fires, and the use of water supplied to customers from publicly connected faucets. "Water supply" refers to a pure, high-quality water supply that meets the National Water Supply Quality Standard and is devoid of chemicals that could endanger the health of people or animals.

Access to water, sanitation, hygiene, cleaning, and waste management (WASH) in healthcare facilities is hampered by a lack of funding and supportive policy environments.

Groundwater is the main source of drinking water in Nepal's Kathmandu Valley. This review explores the impact of water and sanitation on human health in Nepal, drawing on key studies by Mishra and colleagues. Post-earthquake assessments of the Salyankot water supply project (Mishra, 2019) highlight sustainability risks and performance challenges, while Mishra (2019) evaluates water finance in drinking systems. Recent work emphasizes solar-powered pumping for cost-benefit gains (Mishra et al., 2023) and links educational deficits in Madhesh Province to broader development pains affecting WASH access. Complementary insights into quality management in infrastructure underscore vulnerabilities exacerbating health risks like waterborne diseases amid resource scarcity.

Conclusion

It is not practical for the government to provide centralized treatment systems to every municipality, even though it is investing in

treatment facilities, enforcing regulations, and promoting the reuse of treated wastewater.

The study would like to suggest that funding for operations and maintenance be managed after the project is implemented. The water users committee should be trained in capacity building before the schemes are handed over.

Nepal created national drinking water quality standards in 2022 and domestic wastewater effluent standards in 2023 to protect the environment and public health. Access to clean, safe drinking water is a fundamental human right, particularly in developing countries with poor centralized infrastructure. In Nepal, community-managed water supply systems are crucial.

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References

Asia & the Pacific. (2020). *Federal Democratic Republic of Nepal: Country overview*. FMM, 1–6.

Asian Development Bank. (2022). *Nepal: Third small towns water supply and sanitation sector project—Project completion repor*t. Asian Development Bank.

Asian Disaster Preparedness Center. (2021). *Water sector policy and guideline of Nepal*. Climate Adaptation and Resilience (CARE) for South Asia.

CDCC Consortium Nepal. (2023). *Impacts of climate crisis and environmental degradation on children and youths in Nepal*. Child-Centered DRR and Climate Change (CDCC).

Chettry, L., Bohara, P., Bohara, R. C., Rijal, R., Khadha, S., Subedi, H., & Anderson, D. M. (2024). Budgeting and advocacy to improve water, sanitation, and hygiene in health care facilities: A case study in Nepal. *Global Health: Science and Practice, 12*(3), 1–14. https://doi.org/10.9745/GHSP-D-23-00491

Dhital, S. R., Chojenta, C., Evans, T. J., Acharya, T. D., & Loxton, D. (2022). Prevalence and correlates of water, sanitation, and hygiene (WASH) and spatial distribution of unimproved WASH in Nepal. *International Journal of Environmental Research and Public Health, 19*(6), 3507. https://doi.org/10.3390/ijerph19063507

Gautam, G., & Dahal, K. R. (2020). Issues and problems of community water supply schemes with special reference to Nepal. *Journal of Civil, Construction and Environmental Engineering, 5*(5), 114–125. https://doi.org/10.11648/j.jccee.20200505.13

Ghimire, G. M., Mishra, A. K., & Aithal, P. S. (2023). Impact of flood on children nutrition. *International Journal of Health Sciences and Pharmacy,* 15–34. https://doi.org/10.5281/zenodo.8260306

Ghimire, M. N. (2014). Health status of children of Chepang and other communities of Nepal. *Journal of Advanced Academic Research, 1*(1), 24–28.

Ghimire, M., & Maharjan, R. K. (2014). Antenatal and post-natal check-up practices among Chepang and non-Chepang communities of Nepal. *Journal of Advanced Academic Research, 1*(2), 64–73. https://doi.org/10.3126/jaar.v1i2.16590

Ghimire, M., & Mishra,A. K. (2025). Impact of healthcare services on human health in Nepal: A review. *Insight Journal of National Open College, 2*(1), 51–60. https://doi.org/10.5281/zenodo.15365721

Ghimire, M., Mishra, A. K., Bolar, J., & Aithal, P. S. (2023). Day snacks for community school children in Nepal: A review. *International Journal of Health Sciences and Pharmacy, 7*, 104–125. https://doi.org/10.5281/zenodo.10091884

Ghimire, M., Mishra, A. K., Bolar, J., & Aithal, P. S. (2024). Measurement of anthropometry of community school children affected from day snacks. *International Journal of Health Sciences and Pharmacy, 8*(1), 17–31. https://doi.org/10.5281/zenodo.10907868

Ghimire, M., Regmi, T., Kayastha, S. P., & Bhuiyan, C. (2023). Groundwater quality and community health risk in Lalitpur Metropolitan City, Nepal: A geospatial analysis. *Geocarto International, 38*(1), 1–46. https://doi.org/10.1080/10106049.2023.2168069

Ghimire, M., Shrestha, E. B., Mishra, M. A., & Bolar, D. K. (2024). Banana cultivation practices in the Mid-Terai area of Nepal. *International Journal of Computational Research and Development, 2*(9), 53–57. https://doi.org/10.5281/zenodo.13333215

Government of Nepal. (2022). Water Supply and Sanitation Act, 2022. Government of Nepal.

Guragain, M. P., & Celestin, M. (2025). Evaluation of customer service and performance in community-managed water supply systems in Jhapa district, Nepal. *Apex Journal of Business and Management, 4*(1), 49–59. https://doi.org/10.61274/apxc.2025.v04i01.005

Howard, G. (2016). Climate change and water and sanitation: Likely impacts and emerging trends for action. *Annual Review of Environment and Resources, 41*, 253–276.

International Federation of Red Cross and Red Crescent Societies. (2021). *Climate change impacts on health and livelihood: Nepal assessment.* IFRC.

Karki, B. K., Baniya, S., Kharel, H. L., Angove, M. J., & Paudel, S. (2024). Urban wastewater management in Nepal: Generation, treatment, engineering and policy perspectives. *H2Open Journal, 7*(2), 222–244. https://doi.org/10.2166/h2oj.2024.105

Khadka, M., Joshi, D., Uprety, L., & Shrestha, G. (2023). Gender and socially inclusive WASH in Nepal: Moving beyond technical fixes. *Frontiers in Human Dynamics, 5*, 1181734. https://doi.org/10.3389/fhumd.2023.1181734

Kohlitz, J., Geremew, A., Okurut, K., Poudel, P., Valenzuela, A., & Falletta, J. (2025). What makes household sanitation systems resilient to floods? Evidence from Nepal, Ethiopia, and Uganda. *VeriXiv, 2*(100), 1–14. https://doi.org/10.12688/verixiv.963.1

Ministry of Forests and Environment. (2021). *National adaptation plan* (*NAP*) *2021–2050.* Government of Nepal.

Ministry of Health and Population. (2022). *Nepal demographic and health survey 2022.* Government of Nepal.

Ministry of Water Supply. (2024). *Water supply, sanitation and hygiene (WASH) sectoral development plan 2024–2043*. Government of Nepal.

Mishra, A. K. (2019). Water finance assessment in drinking water supply system. *Saudi Journal of Economics and Finance, 3*(9), 383–394. https://doi.org/10.21276/sjef.2019.3.9.3

Mishra, A. K., Ghimire, M., & Aithal, P. S. (2023). Effects of foreign employment on returnee workers' attributes for entrepreneurship development. *International Journal of Management, Technology and Social Sciences, 8*(4), 106–118. https://doi.org/10.5281/zenodo.10067247

Mishra, A. K., Nepali, P., Jha, M. N., & Aithal, P. S. (2023). Commissioning of water supply and sanitation projects: A case from Nepal. *International Journal of Case Studies in Business, IT, and Education, 7*(2), 106–129. https://doi.org/10.5281/zenodo.7857854

National Statistics Office. (2021). *National population and housing census 2021: National report.* Government of Nepal.

Nelson, S., Drabarek, D., Jenkins, A., Negin, J., & Abimbola, S. (2021). How community participation in water and sanitation interventions impacts human health and service longevity: A realist review. *BMJ Open, 11*, e053320. https://doi.org/10.1136/bmjopen-2021-053320

Paudel, B. P., & Devkota, B. (2024). Water sanitation and hygiene practices of the indigenous Tharu community in Chitwan, Nepal. *IOP Conference Series: Earth and Environmental Science, 1307*, 012019. https://doi.org/10.1088/1755-1315/1307/1/012019

Poudel, P. (2025). Water sanitation, hygiene practices, and morbidity status in Pokhara, Nepal. I*nternational Journal of Innovative Research in Technology, 12*(1), 2030–2036.

Tamang, T., Paudel, S. R., & Adhikari, B. R. (2024). Post-disaster situation of water, sanitation and hygiene of displaced persons: A case from Khalte, Rasuwa. *Proceedings of IOEGC,* 14, 222–226.

Thakur, R. C. (2023). Reviewing for the nexus: Human resource development practices and employee commitment in organizations. *WOW: Wisdom of Worthy Research Journal, 1*(1), 33–39. https://doi.org/10.5281/zenodo.10440747

Timilsina, R. K., Ghimire, M., Mishra, A. K., Shrestha, E. B., Adhikari, S. R., & Kumar, D. A. (2014). Sociological aspects of employment opportunities and financial benefits for small poultry entrepreneurs in Nepal. *International Journal of Applied and Advanced Scientific Research, 9*(2), 56–63. https://doi.org/10.5281/zenodo.13333239

Waddington, H. S., & Carter, B. (2021). *Water, sanitation and hygiene for reducing childhood mortality in low- and middle-income countries: Protocol.* Campbell Systematic Reviews. https://doi.org/10.1002/cl2.1135