

## Water and Sanitation for Population Health and Wellbeing: The Nepalese Initiatives

Keshab Prasad Adhikari, PhD\*

### Abstract

*A person's wellbeing is highly dependent on both the quality and the availability of water, and efficient management of this precious resource. Both biological disease agents and chemical pollutants are compromising drinking-water quality. Contaminated water causes a range of often life-threatening diseases. Of the waterborne diseases affecting a person's health, mostly children, the deadliest are diarrhoeal infections. To manage the supply of quality water with the required quantity, it needs proper policy and programme in place to ensure improved and total sanitation for public wellbeing. Though the implementation strategies are constrained by resource scarcity, poor designing, environmental catastrophes, Nepal has done ample policy and planning efforts in the water and sanitation sector.*

**Keywords:** water, sanitation, total-sanitation, health, wellbeing

### Background

The importance of water has attracted human attention, since ancient times in both eastern and western civilisations. It is taken as holy good of purity while performing religious-cultural rites in our society and taken as a source of life and operation of the natural cycle. Therefore, water is a source of maintaining good health of the natural processes and ecosystem of the earth; fostering human civilisations and human's aesthetic and internal (physiological) health. Maintenance of human health is dependent on adequacy and safety of food intake and use of safe and clean water and access to minimally acceptable sanitation facilities. Public sanitation depends on usable water's four characteristics as quantity, availability, reliability, and quality (QARQ). The components of sanitation to affect health and quality of human life include personal cleanliness; washing clothes; behaviour of proper hand washing; use of improved toilets; making households and communities open defecation free (ODF); septic wastewater drainage system, and the others. Until, 2019 26% of the world's population is out of the coverage of at least a basic sanitation<sup>†</sup> service and the figure increase to the 38% population of Nepal. Globally, inadequate sanitation claims annually a

---

\*Dr. Adhikari is the Associate Professor of Population Studies at the Central Department of Population Studies at Thribhuvan University. Additionally, he has been working as the Coordinator of Labour Studies at the same university.

<sup>†</sup> Reliable water supply, toilets or latrines, open defecation free, and systems for the safe management of excreta.

sizable\* diarrhoeal deaths and is accorded as a significant factor to induce several neglected tropical diseases, including intestinal worms, schistosomiasis, and trachoma. Poor sanitation and unsafe water also contribute to childhood malnutrition (WHO, 2019). Realising the multifaceted importance of the commodity, the constitution of Nepal (2015) under the right to health care (clause 35) takes access to clean water and hygiene as fundamental rights of its all citizens (Constituent Assembly Secretariat, 2015).

Owing to the important contribution of water and sanitation in poverty reduction and ending hunger, the 2030 agenda of Sustainable Development Goals (SDGs) take water and sanitation in sixth<sup>†</sup> of 17 priority area of ending global poverty of its all forms. While adopting the agenda, global leaders widely recognised water and sanitation as fundamental human rights; and placed increased attention on water and sanitation issues in the global political agenda with the statement of:

Enough fresh water in quantity and quality, is essential for all aspects of life and sustainable development. ---- Water resources are embedded in all forms of development e.g., food security, health promotion and poverty reduction, in sustaining economic growth in agriculture, industry and energy generation, and in maintaining healthy ecosystems (UN 2018).

Owing to the importance of sanitation on human health, the SDG target 6.2 calls for the guaranteeing adequate and equitable sanitation for all, that has characteristics of ‘safely managed sanitation services’ – privately use of an improved sanitation facility by households, where the excreta produced are either safely treated in situ, or transported and treated off-site (WHO, 2019).

The global burden of diseases and fatalities resulted from inadequate water, sanitation, and hygiene are preventable. However, it still is claiming over 800,000 lives each year from low- and middle-income countries – of which 60% of total diarrhoeal deaths. The largely preventable diarrhoea remains a major killer. Improved water, sanitation, and hygiene could prevent a significant number of deaths of children aged under five years. Therefore, beyond reducing the risk of diarrhoea, benefits of improved sanitation extend to:

reducing the spread of neglected tropical diseases such as intestinal worms, schistosomiasis and trachoma, that cause suffering for millions; reducing the severity and impact of malnutrition; promoting dignity and boosting safety, mainly among women and girls; promoting school attendance of girls by the provision of separate sanitary facilities; and, potential recovery of water, renewable energy and nutrients from fecal waste (WHO, 2019).

Studies concluded that there was a return of 5.50 US\$ in lowering health costs, increasing productivity, and reducing premature deaths for every 1 US\$ investment in sanitation (WHO, 2019).

Safe drinking water supply and sanitation services are fundamental instruments for improving public health and meeting national poverty reduction objectives. It is

---

\* Estimated total of 432,000 in 2019

<sup>†</sup>Ensure availability and sustainable management of water and sanitation for all

recognised that lack of access to these essential basic services contributes substantially high burden of disease. The beginning of systematic planning in utilisation of water, sanitation and hygiene is the history of epidemiology, medicine and public health. It also depicts the history of industrialisation, urbanisation and related urban misery. Limited access to this service impairs the lives of too many populations of the country. Many people, both in rural and urban areas, are affected by waterborne and water-related diseases due to the use of unsafe water, poor hygiene practices and inadequate sanitation facilities. This pushes people to face several problems and lose opportunity to income sources. Rural women particularly, are deprived of finding income sources due to hardship of availability of water as they spend several hours a day to fetch water from far away sources (MoUD, 2014).

Water and Sanitation (in brief called WASH) refers to the provision of safe water for drinking, washing, and domestic activities, the safe removal of waste (toilets and waste disposal) and health promotion activities to encourage protective healthy behavioural practices amongst the populations. WASH was essential to meet the Millennium Development Goals related to environmental sustainability and health. It receives equal importance in the 17 Sustainable Development Goals (SDGs). Inadequate WASH can restrict medical treatment in health facilities, degrade environmental conditions and increase community vulnerability, and impede achievement of sustainable development targets.

### **WASH for improved and total sanitation**

Water is a key component to attain universal access to improved sanitation for better hygiene, health and environment – and to create total sanitised communities. The Nepal Sanitation and Hygiene Master Plan, 2011 (GoN, 2011), defines different conditions and processes of mitigating a society as total sanitised or total behavioural change if achieves the mutually re-enforcing and inter-related actions and behaviours. The interrelated conditions and actions to attain total sanitation and behavioural changed society are those, if meet the following essential elements:

#### ***Improved sanitation facilities (Toilet)***

Adopting from the Joint Monitoring Program (JMP) of UNICEF and WHO, the Master Plan defines an improved sanitation facility as one that hygienically separates human excreta from human contact. Toilets made only for single household use, of the following types are considered as improved sanitation facilities: Flush or pour-flush to piped sewer system, septic tank, pit latrine; ventilated improved pit (VIP) latrine; pit toilet with slab and lid; and composting toilet (eco-san).

#### ***Total sanitation***

The Master Plan 2011 defines the term Total Sanitation as a 'range of facilities and hygiene behaviour that lead to achieving sanitized condition of the designated areas (VDC and municipality including settlements, *Toles*, school's catchments, etc). Total Sanitation concentrates on ending Open Defecation as a first significant step to an entry

point of changing behaviour. The second step includes all arrangements leading to ensure sustainable hygiene and sanitation behaviours. Therefore, the concept of total sanitation expects to achieve a sanitized condition in two phases in a sustainable manner as follows:

### ***Open defecation free (ODF) situation***

Open Defecation (OD) means defecating in the open and leaving the faeces exposed. ODF means 'Open Defecation Free' i.e., no faeces are openly exposed to the air. The collection of faeces in a direct pit with no lid is also a form of OD but with a fly proof lid, then qualifies for ODF. The following indicators/criteria are necessary to meet to declare ODF:

No presence of OD in any designated area at any given time; all households have access to improved sanitation facilities (toilets) with full use, operation and maintenance; all the schools, institutions, offices within the designated areas have toilet facilities; availability of soap and soap case for hand washing in all households; and, general environmental cleanliness including management of animals, solid and liquid wastes is in place in the designated area.

### ***Total sanitized post-ODF situation***

This phase includes all arrangements leading to sustainable hygiene and sanitation facilities and behaviours. Although the respective community/VDC/municipality themselves may identify and implement various hygiene and sanitation parameters during the post-ODF in the following three dimensions. *First, five* behavioural change related indicators of key hygiene and sanitation include use of toilets; practice of hand washing with soap or cleaning agent at critical times; safe handling and treatment of drinking water (e.g. Point of use treatment) at households; maintenance of personal hygiene (regular nail cutting, bathing, cloth washing, daily combing, tooth brushing etc.); and proper solid and liquid management in and out of the home. *The second* dimension of indicators are related to household sanitation such as mandatory provision of toilet and hand washing facilities such as soap, washing platform; availability of brush, brooms, cleaning agent, etc. at the toilet; covering food and water; regular cleaning of rooms, yards, and household compound; management of animal shed; construction of covered wastewater pit; access of safe drinking water; provision of bins/pits to collect/dispose solid waste, and, installation of improved cooking stove/biogas (optional). *The third* categories of indicators are related to institutional sanitation. Arrays of prescribed indicators include all institutions must have users-friendly clean, hygienic toilets with hand washing with soap station and proper waste management facilities; schools must have child, gender and differently able (CGD) friendly water, toilet and hand washing (with soap station) facilities including menstrual hygiene facilities. They must have garbage pit facilities within the premise, and all institutions must keep their premises clean and hygienic.

Though the coverage of the water and sanitation schemes in rural areas accorded to increase substantially in the country, studies (MoUD, 2014) identified the following types of problems the rural WASH sector facing in the country:

poor functionality of the completed schemes - about half of the schemes are reported as non-functioning and are in urgent need of massive maintenance; conversion of rural settlements as urban centres after construction of WASH schemes and the system to be grossly inadequate in many of the rural communities due to increased population and improved living standards of the people; depletion and drying up of the surface and sub-surface sources, and dispute in the source among competing user community and competing use of water from the source in absence of a scientific and comprehensive water resource planning at local levels (MoUD, 2014).

Ownership for planning, implementation, management, and maintenance given to the local user communities viewed to overcome such problems/constraints.

### **Emergence of the WASH sector in Nepal**

With the establishment of the Department of Water Supply and Sewerage in 1972, the government of Nepal started to give high priority to the sustainable promotion and development of the WASH sector in the country. Since then, in close collaboration with community organisations and external development partner's government introduced a number of water, hygiene and sanitation related policies, strategies, plans and action programmes aimed at achieving total sanitised communities and localities in the country. Accordingly, the government showed its active participation in WASH related global and regional conferences and meetings, endorsed and ratified movements and declarations. As a result, the sector received high-level political commitment through putting water, hygiene and sanitation as fundamental rights of the people in the Constitution of the Federal Republic of Nepal 2072 (2015). The National Water Supply and Sanitation Sector Policy-2014 is the recent most initiative for the long-term sustainability of the sector. The policy identified six mutually reinforcing components of active participation and coordination in the successful implementation of community-level WASH activities for its longer-term sustainability. The mutually re-enforcing six pillars for the longer-term sustainable development of the sector as outlined in National Water Supply and Sanitation Sector Policy 2014 include, 1) gender equity and social inclusion, 2) environmental sustainability, 3) cost recovery and affordability, 4) operation and maintenance, 5) institutional management, and 6) legal frameworks. Where ways, the National Water Supply and Sanitation Sector Policy 2014 is the outcome of series of related plans, policies, programs and strategies consistent with the international policy instruments as in Table 1.

Table 1: Chronological initiatives and commitments in the development and strengthening of Water, Hygiene and Sanitation Sector in Nepal

Year	Initiatives, Major Objectives/features
1972	- Establishment of the Department of Water Supply and Sewerage (DWSS) during the period of fourth Development Plan 1970-1975
1980	- Signatory of UN Declaration for International Drinking Water

	Supply and Sanitation Decade
1992	- Establishment of the Environmental Sanitation Section (ESS) at DWSS
1993	- <i>Janatako Khane Pani Ra Sarasafai Karyakram</i> , (JAKPAS), MPPW/World Bank (Pilot 1993-1996)
1994	- Nepal National Sanitation Policy and Guidelines for Planning and Implementation of Sanitation Program, MPPW • KAP study on sanitation, DWSS/UNICEF
1996	- National Policy on Solid Waste Management - Establishment of Rural Water Supply and Sanitation Fund Development Board (Fund-board) (exist till date)
1998	- Establishment of the Steering Committee for National Sanitation Action (SCNSA) - National Water Supply Sector Policy (Policy and Strategy), MPPW - Establishment of Department of Local Infra Structure Development and Agricultural Roads (DOLIDAR)
1998	- Department of water supply and sewerage (DWSS) and UNICEF, developed 'Basic Sanitation Package' - Department of water supply and sewerage (DWSS) developed 'Five Year Action Plan on Environmental Sanitation Promotion' - Ministry of Local Development (MoLD) implemented 'Local Self Governance Act' where WASH is taken as a high priority area of community development
2000	- DWSS & SCNSA, in collaboration with UNICEF, prepared and published 'Nepal State of Sanitation Report' - SCNSA initiated to observe and celebrate 'Annual National Sanitation Week' - DWSS & UNICEF introduced 'School Sanitation and Hygiene Education (SSHE)' program in 15 districts of the country - DWSS prepared a draft version of 'National Sanitation Policy – 2000' and revised in 2002 - Initiation of 'Water Resources Management Project (WARMP)' in six districts of Mid-western and Far-western regions with support of Helvetas (2000- 2012)
2003	- DWSS, in support of ADB, initiated 'Community Based Water Supply and Sanitation Project'

	<ul style="list-style-type: none"> <li>- Government level participation in the 'First South Asian Conference on Sanitation (SACOSAN)' in Bangladesh</li> <li>- SCNSA/NEWAH initiated 'Nepal WASH campaign' in the country</li> <li>- DWSS/RWSSFDB, in collaboration with UNICEF, developed 'Participatory Hygiene and Sanitation Transformation (PHAST) approach</li> <li>- Piloting of Community-Led Total Sanitation (CLTS) approach</li> </ul>
2004	<p>Development and Enforcement of:</p> <ul style="list-style-type: none"> <li>- <i>National Rural Water Supply and Sanitation Policy</i>, and</li> <li>- <i>Rural Water Supply and Sanitation National Strategy</i></li> </ul> <p>The policy and strategy contained the following objectives:</p> <ul style="list-style-type: none"> <li>o To set a new target to provide safe, reliable and affordable water supply with basic sanitation facilities to all population giving special priority to the backward and ethnic communities</li> <li>o Reduce water-borne diseases and save the time and labour of men, women and children from fetching the water</li> <li>o Focus on a massive renovation, rehabilitation, improvement and expansion works of the existing system and increase the quality of service.</li> </ul>
2005	<p>Launched '<i>National Water Plan</i>' with an overarching objective to reduce the incidence of poverty, unemployment and under-employment in the country. Specific goals are as following:</p> <ul style="list-style-type: none"> <li>- To provide people with access to safe and adequate drinking water and sanitation to ensure good health; increase agricultural production and productivity for food security; --</li> <li>- To prevent and mitigate water-induced disasters</li> </ul>
2009	<p><i>National Policy for Urban Water Supply and Sanitation</i> with the following objectives is introduced.</p> <ul style="list-style-type: none"> <li>- To set the cost recovery principles, public-private partnership and sector effectiveness for improved service delivery in proper perspectives according to the need of the day</li> <li>- Identified four major initiatives addressing 'National Urban Water Supply and Sanitation' challenges as a) Small Towns Water Supply and Sanitation Sector Project (STWSSSP); b) Kathmandu Valley Water Supply Sector Development Program (KVVSSSP); c) Urban Environment Improvement Project (UEIP), and d) Integrated</li> </ul>

	Urban Development Projects (IUDP).
2011	<p><i>National Hygiene and Sanitation Master Plan</i></p> <p><i>Goals:</i> The goal of the Master Plan is to attain universal access to improved sanitation by 2017 for better hygiene, health and environment.</p> <p><i>Objective:</i> overall objective of the Master Plan is to create an enabling environment to achieve the national goal of sanitation through collaborative efforts of the government, local government bodies, UN Agencies, bi-lateral agencies, I/NGOs, schools, private institutions, media, civil society organizations, local clubs and CBOs. The primary objective of the Master Plan is to delineate the ways to provide a strategic direction for all the concerned stakeholders to reduce Acute Respiratory Infection (ARI), diarrhoeal disease and other infectious diseases through pragmatic program interventions.</p>
2014	<p><i>National Water Supply and Sanitation Sector Policy</i></p> <p><i>Goal:</i> to reduce urban and rural poverty by ensuring equitable socio-economic development, improving health and the quality of life of the people and protecting the environment through the provision of sustainable water supply and sanitation services.</p> <p><i>Objectives:</i></p> <ul style="list-style-type: none"> <li>- To ensure availability of safe and adequate water supply and sanitation services to all, which include:</li> <li>- Access to and participation of the users, especially that of women, poor and the marginalized groups to serve their interest; protection, development and management of existing and potential surface and ground-water sources and to protect water sources from wastewater pollution. Concerning to technical and financial sustainability, it calls for promotion and use of affordable and cost-effective alternative technologies, local institutional capabilities for planning, implementation and management of water supply and sanitation services, consumer's choice cost recovery schemes to raise the tariff to meet all operation and maintenance costs, promote public-private partnership and strengthen legal framework in the sector for sustainable service delivery.</li> </ul>

Source: National Water Plan (nd.); GoN, 2011; MoUD, 2014; MoLD Nepal & MoFA Finland, 2005; WaterAid Nepal, 2005.

### *The planned efforts*

From the beginning of the planned development efforts, all plans have given ample attention to providing drinking water facilities to mitigate the dual objectives of improvement in health and sanitation of common people. Evidences confirmed that drinking water and sanitation programmes are primarily initiated in urban areas and some of rural areas before 1960 (NPC, 1990). Planned initiatives, starting from the fifth five-year plan periods, are taken as benchmark in the field and summarised as follows:

The ***Fourth Five Year Development Plan*** (1970-75) developed 'Drinking water and Sewerage Master Plan'.

- The ***Fifth Five Year Development Plan*** (1975-1980), for the first time set a target of making 'drinking water' available to the maximum number of people, within the next five years. For this, the plan has given importance to rural drinking water Projects in collaboration with the local people themselves (NPC, 1975).

- The ***Sixth Plan*** (1980-85) has taken drinking water and sewerage as public goods of primary necessity of the public sanitation. It has accorded that the provision of pure drinking water raises the health status of the population along with improvements in environmental sanitation. The plan made provision to select projects that are implemented with the active cooperation of the people, who are to be the direct beneficiaries.

- The ***Seventh Plan*** (1985-1990) targeted to supply 317.40 million litres of piped water per day (177.80 million litres in rural and 139.60 million litres in urban areas) covering 12.2 percent population of the total, 11.7 percent populations of the rural areas and 79.9 percent population in the urban areas through the pipe system.

- The ***Eighth Plan*** (1990-1995) devotes a separate chapter on '***drinking water and sanitation***' and takes the availability of drinking water and minimum sanitary facility as the basic needs for the people. Through the rigorous review of past efforts in the sector and existing problems, the plan delineated two objectives as:

- a. To provide drinking water facility to 72 percent of the population, in coherence with the target to provide such facility to the entire communities in the next ten years.

- b. To provide basic knowledge of sanitation and sanitary facilities to a maximum number of people on clean environment and environmental conservation.

The plan, for the first time, placed importance to the implementation of rural drinking water and sanitation programmes in an integrated manner. For this, it laid provision of public-private partnership, broader community mobilisation, women's participation, it gave priority to small projects that require a lesser per capita cost of construction, maintenance and repair at the grassroots level. It made involvement of the user's committee mandatory in all stages of drinking water project, such as identification, design, implementation and maintenance. The plan gave avenues of the involvement of NGOs, local bodies and the private sectors in the construction, maintenance, repair and rehabilitation of the drinking water and sanitation schemes. The plan had taken the policy option of rising community awareness towards health and sanitation through health education. Likewise, the eighth plan ensured multi stakeholder's involvement in

drinking water and sanitation schemes as *NGOs, Private Entrepreneurs, Firms, Companies and Users'communities* basis on cost-sharing, and arrangements of monitoring and supervision of rural drinking water projects (NPC, 1990).

The *Ninth Plan* (1995-2000) gave the importance on the availability of pure drinking water and improved sanitation to make people healthier and save their wasted time in fetching water. The Plan had targeted to provide drinking water facilities to all the people and to expand pure drinking water facilities within the next 20 years. Construction of sewerage treatment system in all urban areas within the next 20 years was planned. To improve the sanitation situation of rural areas, policy encouraged people to construct appropriate and affordable latrines that fit to the local condition (NPC, 1995).

The *Tenth Plan* (2002-2007), also known as the Poverty Reduction Strategy Paper (PRSP) of the country, has taken accessibility and availability of '*drinking water and sanitation services*' as an integral component of the long-term overarching vision of poverty reduction. The long-term vision of drinking water and sanitation service of the plan was to assure the facilities as per the twenty-year Drinking Water Service Perspective Plan. The plan categorized drinking water service into three different levels, viz., high, medium and basic, employing indicators like water quantity, quality, access, supply and reliability. The plan targeted to provide as high as 25 percent population high-level service, provide medium level service to 60 percent population, and to provide basic level service to 15 percent of population (NPC, 2002).

The sector level objectives adopted by the Tenth Plan were:

- Provide basic drinking water service to all regions of the country by gradual upgrading the level of services by the end of the plan period.
- Provide appropriate sanitation facilities both in urban and rural areas by increasing public awareness.
- Assist to reduce the child mortality rate by controlling waterborne and water induced diseases and help to increase income generation through opportunity of utilizing saved labour from illness.
- Involve the private sector in the overall management of urban water supply systems/ facilities and the improvement and up-grading of drinking water projects.

The *Three Years Interim Plan* (2007-2010) adopted water supply and sanitation-related long-term vision and objectives as follows:

- The long-term vision of the water supply and sanitation sector is to contribute towards raising the living standard and the status of public health by making sustainable and equitable availability of water supply and sanitation services.
- In line with the *National Water Plan 2005\**, the water supply and sanitation sector *objectives* of the plan were to ensure sustainable water supply services and a

---

\*The plan had set target of achieving total population coverage of basic level of drinking water supply and sanitation services by the year 2017

healthy environment through socially inclusive development initiatives; gradually provide purified drinking water to the whole population; providing treatment facility with an inclusive sewerage system in urban, semi-urban areas and emerging towns; and providing toilets using appropriate technology in rural areas (NPC, 2007).

The second *Three-year Interim Plan* (2011-2013) is developed in line with the longer-term National Water Plan 2005. It adopts the vision and objectives that are compatible to attain universal access to a basic level of drinking water and sanitation services by the year 2017. The objective explicitly states that making sustained availability of safe drinking water and sanitation services helps to improve public health and living standard of the population (NPC, 2011). Likewise, the sectoral policies and planning of the Thirteenth Plan (2014-2016) also corroborate the visions, objectives and targets of the National Water Plan (GoN, 2005) to provide minimum water supply and sanitation services to all population by the year 2017 (NPC, 2014). The approach paper of the *Fourteenth Plan* (2017) targeted to provide essential drinking water and sanitation services to all populations. The dual objectives of the plan include:

- To provide drinking water and sanitation services of a basic standard to all population and
- To expand medium or high standard services of drinking water and sanitation services (NPC, 2016).

The review of planned efforts in drinking water and sanitation services in Nepal revealed that the concept of total sanitation emphasized from the eighth plan period. The plan is also known as philosophical shift from a state-controlled approach to the involvement of the public-private sector in the sector's development. Process of involvement of user committee in construction, maintenance, operation, repair and rehabilitation of the rural water supply schemes is made mandatory since the 1990s. The seventh goal of MDG 'Sustainability' becomes **the guiding principles of the visions and objectives of National Water Plan 2005 and that of the periodic plans concerning to drinking water and sanitation.**

### **Discussion and conclusion**

Though the universal access to basic sanitation, efforts of elimination of open defecation, reach to essential drinking water source appears in the route of improvement; the universal access to basic sanitation in both urban and rural settings of Nepal requires additional efforts. The eight goals of Millennium Development (MDGs) and 17 goals of Sustainable Development (SDGs) explicitly called for national and international cooperation and technical assistance for capacity building and broader mobilization of non-governmental organization, community-based organizations and the user communities for the planning, management and maintenance of the water and sanitation schemes. Accordingly, since the tenth development plan (2002-2007), the Government of Nepal started to take 'poverty reduction through the means of inclusive development' as the overarching development objective in the country. In its poverty reduction strategy paper, the water and sanitation sector is taken as an instrumental component contribute to the achievement of the ultimate goal of poverty reduction and

social wellbeing. The water plan, rural and urban water and sanitation policies and strategies also called for community and user group mobilization to sustain the schemes. Likewise, the National Water Supply and Sanitation Sector Policy 2014 points out the importance of the broader participation of user groups, marginalized and backward communities for the protection, development and management of water and sanitation schemes from all potential sources, for financial and technical sustainability and building institutional capability.

The national government as an apex authority in collaboration with development partners, civil societies and the private sector need to lead the efforts of maintaining public health, prevent transmission of diseases, advising local governments on health-based regulations including water and sanitation. It requires estimating and monitoring the role of water and sanitation in reducing the burden of disease and the level of sanitation access and analyses what helps and hinders progress. This effort is necessary to enable from local to federal governments to generate reliable information/data to decide level of investment to facilitate construction of toilets and to ensure safe management of wastewater and excreta.

*Acknowledgements:* The author is thankful to the anonymous reviewer for insightful feedback.

*Funding:* Author received no funding to prepare this manuscript.

### References

- Constituent Assembly Secretariat (2015). *Constitution of Nepal 2015*. Singha Durbar Kathmandu: Constituent Assembly Secretariat
- GoN. (2005). *National Water Plan- Nepal*.
- GoN. (2011). *Nepal: Sanitation and Hygiene Master Plan*. Kathmandu: Steering Committee for National Sanitation Action (SCNSA).
- MoUD. (2014). *National Water Supply and Sanitation Sector Policy 2014*. Kathmandu: Government of Nepal, Ministry of Urban Development (GoN/MoUD).
- National Water Supply and Sanitation Sector Policy*
- NPC and UNDP. (2014). *Nepal Human Development Report 2014 (Beyond Geography, Unlocking Human Potential)*. Kathmandu: National Planning Commission (NPC) and United Nations Development Programme (UNDP).
- NPC. (1975). *The Fifth Plan*. Kathmandu: National Planning Commission (NPC).
- NPC. (1990). *The Eighth Plan*. Kathmandu: National Planning Commission (NPC).
- NPC. (1995). *The Ninth Plan*. Kathmandu: National Planning Commission (NPC).
- NPC. (2002). *The Tenth Plan*. Kathmandu: National Planning Commission (NPC).
- NPC. (2007). *The Three Year Eleventh Interim Plan*. Kathmandu: National Planning Commission (NPC).
- NPC. (2011). *The Twelve Plan (Three Year Interim)*. Kathmandu: National Planning Commission (NPC).
- NPC. (2014). *The Thirteenth Plan (Three Years)*. Kathmandu: National Planning Commission (NPC).

- NPC. (2016). *The Fourteenth Plan (Approach Paper)*. Kathmandu: National Planning Commission (NPC).
- UN (2018). Sustainable development goal 6: Synthesis report on water and sanitation. New York: United Nations.
- WHO (2019). The global health observatory: Nepal World health data platform. <https://www.who.int/data/gho/data/countries/country-details/GHO/nepal?countryProfileId=a0b1f4ef-20c7-4ed8-ad1f-bae31926cf86>.
- WHO (2019, 14 July). Sanitation: News facts. <https://www.who.int/news-room/fact-sheets/detail/sanitation> (accessed: 22 Nov. 20 20).