



Achieving Sustainable Development Goal 6 in Developing Countries: Challenges and Opportunities

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Abstract

This research assessed challenges versus opportunities for achieving Sustainable Developing Goal 6 in developing countries. Collective methods were used to harvest data, including a questionnaire survey, interactive focus group discussion, site visits to some water projects, and analysis of three case studies, including Nigeria, Nepal, and Iraq. Results indicated that most developing countries' financial resources are insufficient to manage water and sanitation facilities safely. It also revealed gaps in short-to-longer term capacity building programs and institutional arrangements, lack of effective involvement of local academics, nongovernmental agencies, private sector, women, youth, and vulnerable communities in the decision-making process, lack of public awareness strategy, and inefficient use of water are dominating the scene of the water and environment sectors in developing countries. Moreover, results cited that corruption in some countries is one of the critical factors that slowed down the implementation of improved water and sanitation services, which left these countries years off the track to achieving SDG6. Furthermore, results disclosed that efficient use and management of water at local level, sub-national and national scales is indispensable to address the growing imbalance between water demands and supply and climate change impacts, including the increase in frequency/severity of floods and droughts. Therefore, SDG6 targets should be incorporated into national, sub-national, and local plans, policies, and strategies.

Keywords

SDG6 · Developing countries · Climate change · Efficient use of water · Financial resources · Corruption · Localizing · Capacity building · IWRM · Water stress

1 Introduction

Substantial progress has been made in increasing and improving access to safe water and adequate sanitation services; however, these services are still deficient or unavailable to millions of people living in rural or remote areas in developing countries (GLOBAL TASKFORCE, UNHABITAT, & UNDP, 2016; UN-Water Integrated Monitoring Initiative (UN-Water IMI), 2021). Moreover, the number of vulnerable people is expected to rise mainly due to, but not limited to, rapid population growth, climate change, and the recent COVID-19 pandemic. The pandemic demonstrated the critical importance of adequate access to clean water, sanitation, and hygiene.

2 Methods

Integrated methods were utilized to gather data, including a questionnaire survey, focus group discussion, and analysis of three case studies: Nigeria, Nepal, and Iraq. The Likert scale, a commonly used approach to scaling responses in survey studies, was chosen to gather data and information relevant to SDG6. Five levels were used to measure respondents' level of agreement or disagreement. The levels are strongly agreed, agree, neutral, disagree, and strongly disagree. Interactive focus group discussion involved five small groups of official respondents (8–12) from the Ministry of Agriculture and Water Resources-Kurdistan Regional Government (MoAWR-KRG) of Iraq and Basra's provincial council, south of Iraq. The focus group discussion is a qualitative research instrument aimed at discussing challenges and opportunities and drawing conclusions on

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reasonable approaches supporting the goal and its targets. Site visits to some water projects and water treatment plants in Iraq were conducted to investigate the scale and the complexity of the water supply problem, including inaccessible, unsuitable, and insufficient to meet increased demands, and to draw some conclusions.

3 Results

3.1 Questionnaire Survey and Group Discussion

Table 1 summarizes the results of the questionnaire survey and focus group discussion.

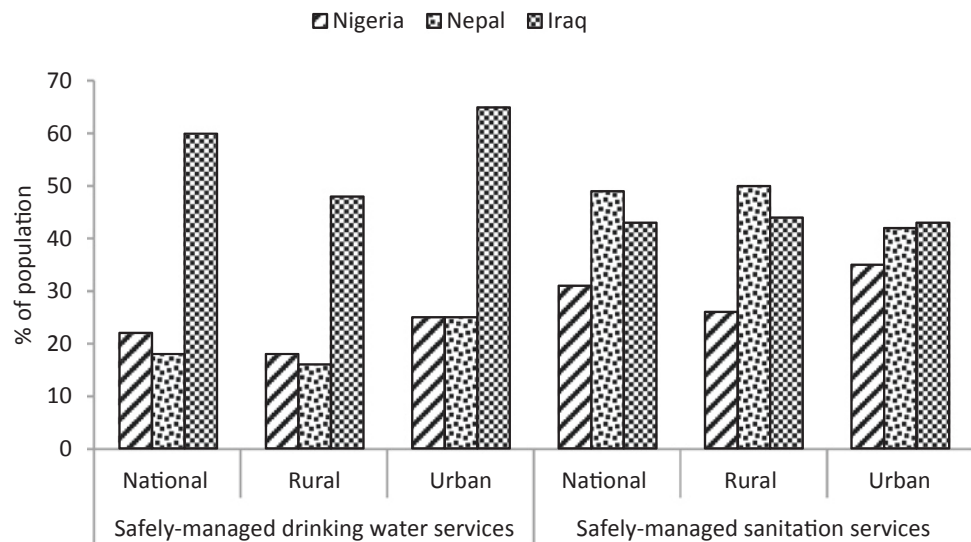
3.2 Case Studies

Three case studies were considered: Nigeria, Nepal, and Iraq. Records showed that 22% (18% in rural areas and 25% in urban areas) and 31% (26% in rural areas and 35% in urban areas) of the population in Nigeria use safely managed drinking water and sanitation services, respectively (Water, 2020a). In Nepal, the corresponding figures are 18% (16% in rural areas and 25% in urban areas) and 49% (50% in rural areas and 42% in urban areas), respectively (Water, 2020b). In contrast, in Iraq, these figures are 60% (48% in rural areas and 65% in urban areas) and 43% (44% in rural areas and 43% in urban areas), respectively (Water, 2020c). Figure 1 illustrates these figures.

Table 1 Questionnaire survey and focus group discussion

Questions	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	(%)				
Water use efficiency is a crucial factor	80	20	–	–	–
Education to protect water resources	78	22	–	–	–
Limited funds allocated for implementation and improvement of water and sanitation infrastructure	68	34	–	–	–
People who pollute water resources should pay for the damage they cause for the environment	38	62	–	–	–
Lack of efficient monitoring system	14	86	–	–	–
Gaps in private sector involvement and public awareness	72	18	–	–	–
Lack of effective engagement of women at all levels	40	60	–	–	–
Gaps in mapping vulnerable areas	45	55	–	–	–
Gaps in the technical capacity of local governments to properly plan and oversee water and sanitation facilities	12	88	–	–	–
Corruption significantly slows the implementation and improvement of water and sanitation services	88	12	–	–	–
Gaps in institutional and human capacities	33	67	–	–	–
Fast-growing population and urbanization outpaced the progress rate toward the possible achievement of SDG6 by 2030	16	84	–	–	–
Developing countries in conflict zones such as Palestine, Syria, Iraq, Libya, and Yemen are alarmingly off track to achieve SDG6 by 2030	12	88	–	–	–
Developing countries are unlikely to achieve SDG6 by 2030 without a considerable change in gear	8	86	6	–	–
Gaps in reliable data and lack of transparent exchange of data and information among key stakeholders	33	67	–	–	–
Gaps in the enforcement of regulations and legislation related to water resources protection	55	45	–	–	–
Developing countries are alarmingly off track to achieve SDG6 by 2030	22	42	20	16	–
Fragmentation and unclear roles and responsibilities of stakeholders who use and potentially pollute water resources	38	62	–	–	–
Gaps in embedment of SDG6 targets in the national, sub-national, and local plans and strategies	–	78	22	–	–

Fig. 1 % of the population with safely managed drinking water and sanitation services



Records also showed that 48% of the household wastewater is safely treated in Nigeria, while Iraq and Nepal are associated with 37% each.

Findings revealed that funds allocated for implementing and improving the water and sanitation services are insufficient, together with corruption that put these countries alarmingly off track to achieve SDG6 by 2030 (Implementation of the SDGs A National Voluntary Review, 2017; International Young Naturefriends, 2018; Raji Kandel, 2019; UN-Water Integrated Monitoring Initiative (UN-Water IMI), 2021; Gautam et al., 2018; Pradhan et al., 2017; Costanza et al., 2016). Corruption impedes the implementation of improved water and sanitation infrastructure, which puts these countries alarmingly off track to reach SDG6 by 2030. In addition, current domestic funds are insufficient to improve and sustainably manage the existing water and sanitation facilities (Implementation of the SDGs A National Voluntary Review, 2017; International Young Naturefriends, 2018; Raji Kandel, 2019; UN-Water Integrated Monitoring Initiative (UN-Water IMI), 2021; Gautam et al., 2018; Pradhan et al., 2017; Costanza et al., 2016). Analysis of case studies suggested the high importance of aligning current national, sub-national, and local development plans with the targets and indicators of SDG6. It also showed that the rational use of water is crucial to address the growing gap between available water and the increasing demand for water to meet multiple purposes (GLOBAL TASKFORCE, UN-HABITAT, & UNDP, 2016; UN-Water Integrated Monitoring Initiative (UN-Water IMI), 2021; Gautam et al., 2018; Asian Development Bank, 2015; Pradhan et al., 2017; Costanza et al., 2016) sustainably. Moreover, findings reported the importance of mapping and incorporating the (SDGs) in the university curriculum and teaching practice (Denby & Rickards, 2016; Leal & Dahms, 2018).

4 Discussion

More funding is required, ranging from more efficient use of existing funds, mobilizing new sources, and scaling-up external financial support. More efficient use of available financial resources and mobilization of external funds, if properly managed, would generate better and more excellent opportunities for making rapid progress.

Collecting, treating, and reusing wastewater from different sources, including domestic, industrial, and agricultural sectors are critical challenges for water and sanitation. Unfortunately, discharges are poorly monitored, together with the absence of adequate treatment. As a result, untreated effluent from these sources is discharged back into proximity water bodies, which significantly deteriorates the water quality and decreases the availability of clean water resources.

Fragmentation of data among various ministries and even agencies within the same ministry impedes progress across all levels. Reliable data and information are either unavailable or not transparently shared between sectors to inform decision-making effectively. Lack of active involvement of local academics, nongovernmental organizations (NGOs), and private industry and gaps in public awareness and effective engagement of the community, particularly women, youth, and vulnerable groups, in the decision-making process and monitoring of progress slows the achievement of SDG6. Gaps in institutional and human capacity, especially at the level of local governments and water and sanitation suppliers, pose an additional challenge.

Levels of water stress are likely to increase due to rapid population growth, increased pollution, and inefficient use of water in various sectors, especially the agricultural industry. Agriculture is the leading consumer of

water among other sectors, yet it is the least efficient sector. Furthermore, climate change (increasing frequency/severity of floods and droughts) poses an additional threat.

The roles and commitments of stakeholders who use and potentially pollute water bodies are fragmented and unclear. Stakeholders should be effectively involved in planning, decision-making, and monitoring results and progress.

Observations report that public and private entities discharge effluent into waterways beyond permissible national limits. In addition, local and federal authorities do not even or adequately fail to implement critical regulations and legislations to ensure adequate water quality. Fundamental rules and legislation, if properly implemented, would protect the water resources and the environment and secure safe water access for people.

Water quality could be further deteriorated because of the impacts of climate change, continued pollution of waterways, and the excessive and inefficient use of water.

5 Concluding Remarks

Accessing safely managed water and sanitation services by 2030 presents a critical challenge in developing countries. This is because a large proportion of the population, particularly in rural or remote areas, lacks access to safely managed water and sanitation systems.

Developing countries are still off track and unlikely to fully achieve the goal by 2030 without a considerable gear change. On the other hand, conflict-torn countries, such as Iraq, Libya, Syria, Palestine, and Yemen are still a long way ahead to achieve the SDG6.

This study highlights the importance of localizing the SDG6—this implies the systematic review of existing strategies and plans and investigation actions taken by key stakeholders is indispensable to ensure the embedment of the SDG6 in the national, sub-national, and local development strategies and techniques. Furthermore, it is essential to determine which authorities are responsible for cracking down on the illegal discharging of pollutants into waterways and illegal water tapping. Accountability should be at the core of any strategy, so there are precise judicial mechanisms where regulators at local, sub-national, and national levels may seek enforcement of regulations to protect water bodies and for people to access safe water.

A national strategy should be launched to educate the public to reduce consumption and use water more responsibly. Embedding SDGs in universities' curriculums and

incorporating sustainable development issues in teaching practice facilitate and support the achievement of sustainable development goals.

Harvesting enough reliable data through comprehensive monitoring and reporting systems with positive indicators would significantly bridge the gap and support the sustainable implementation of SDG6.

This study raised the alarm about the risks that some developing countries may face in the coming years without strategic solutions. Acute water crises and inadequate sanitation services would significantly threaten societal peace.

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