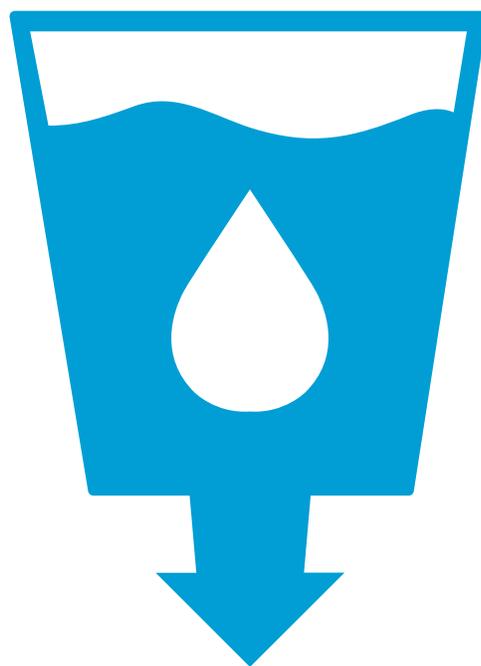


Sustainable Development Goal 6
Synthesis Report on Water and Sanitation

2018

**6 CLEAN WATER
AND SANITATION**



United Nations



Sustainable Development Goal 6
Synthesis Report 2018 on Water and Sanitation



United Nations at a glance

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CONTENTS

Foreword	5
Acknowledgements	6
Executive summary	9
A. Sustainable Development Goal 6 in the 2030 Agenda	10
B. Sustainable water and sanitation for all	10
C. Achieving Sustainable Development Goal 6 targets	11
D. Enabling and accelerating progress towards Sustainable Development Goal 6	15
E. Beyond Sustainable Development Goal 6: Connections across the 2030 Agenda	17
F. Key messages	21
Chapter I. Introduction	23
A. Sustainable Development Goal 6 in the 2030 Agenda	24
B. Sustainable water and sanitation for all	25
C. Monitoring Sustainable Development Goal 6	26
D. Structure of this report	28
Chapter II. Global baseline status of targets and indicators of Sustainable Development Goal 6	29
A. Target 6.1: Achieve safe and affordable drinking water	35
B. Target 6.2: Achieve access to sanitation and hygiene and end open defecation	43
C. Target 6.3: Improve water quality, wastewater and safe reuse	55
D. Target 6.4: Increase water-use efficiency and ensure freshwater supplies	67
E. Target 6.5: Implement integrated water resources management	75
F. Target 6.6: Protect and restore water-related ecosystems	87
G. Targets 6.a and 6.b: Means of implementation	93
Chapter III. Enabling and accelerating progress towards Sustainable Development Goal 6	103
A. Integrating water resources management	104
B. Eliminating inequalities	109
C. Means of implementation	115
Chapter IV. Beyond Sustainable Development Goal 6: Connections across the 2030 Agenda	129
A. Water and society	132
B. Water and the environment	141
C. Water and the economy	161
Chapter V. Key messages	177
A. Integrating Sustainable Development Goal 6 into the 2030 Agenda	178
B. Understanding the baseline status and trends of the global indicators of Sustainable Development Goal 6	178
C. Enabling and accelerating progress towards Sustainable Development Goal 6	181
References	182
Abbreviations and acronyms	195



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THE SECRETARY-GENERAL

FOREWORD

Water is life. Progress in nutrition, health, education, work, equality, environmental protection and international cooperation are all related to the availability and sustainable management of water and universal access to effective systems for disposing of our waste.

These are the objectives of Sustainable Development Goal 6. If we remain off track to deliver on SDG 6 then we jeopardize the entire 2030 Agenda for Sustainable Development.

Yet, today, billions of people still lack access to safe water and sanitation, resulting in needless deaths, chronic disease, missed education and reduced productivity.

At the same time, demand for water -- from agriculture and industry as well as domestic use -- is rapidly rising and water pollution and ecosystem degradation are being made worse by increasing amounts of untreated wastewater. And all of this is happening against a backdrop of climate change, which is playing havoc with the predictability of our most precious resource.

What this report makes clear is that we must tackle weak funding, planning, capacity and governance of water and sanitation services as a top priority. New partnerships are needed, involving stakeholders within and beyond the water and sanitation sectors, to address these fundamental issues, balance competing needs, and act to get SDG 6 back on track. Data and smart technologies must be embraced so interventions can be as effective as possible and progress tracked over time.

The High-Level Panel on Water convened by the United Nations and the World Bank Group issued their final report *Making Every Drop Count* on World Water Day. The report's recommendations set forth a global agenda for water action to help countries reach the SDG 6 targets.

As we intensify our efforts to achieve SDG 6 and advance implementation of the International Decade for Action on Water, we should be guided and inspired by the fact that our work will lay the foundations for a healthier, fairer, more stable, equitable and prosperous world. The United Nations stands ready to support countries and their partners to achieve SDG 6 across the globe.

A handwritten signature in black ink, appearing to read 'António Guterres', with a long horizontal stroke extending to the right.

António Guterres

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EXECUTIVE SUMMARY



A mother gives her child a bowl of safe water in Charsarda District, in Pakistan's northwestern Khyber-Pakhtunkhwa Province, an area severely affected by monsoon floods in 2010. UN Photo/UNICEF/ZAK

A. Sustainable Development Goal 6

All 193 Member States of the United Nations General Assembly unanimously agreed to *Transforming our world: the 2030 Agenda for Sustainable Development* (the 2030 Agenda) in September 2015. The 2030 Agenda is a plan of action for people, the planet and prosperity. Member States resolved to “end poverty in all its forms”, to take bold and transformative steps to “shift the world on to a sustainable and resilient path” and to ensure that “no one will be left behind”.

The 2030 Agenda established 17 Sustainable Development Goals (SDGs) and 169 global targets, relating to development outcomes and means of implementation (MoI), for the period 2015–2030. These were designed to be integrated and indivisible and to balance the social, economic and environmental dimensions of sustainable development. The 2030 Agenda further seeks to realize the human rights of all, and to achieve gender equality and empowerment of all women and girls. This ambitious universal agenda is intended to be implemented by all countries and all stakeholders, acting in collaborative partnership.

The establishment of SDG 6, *Ensure availability and sustainable management of water and sanitation for all*, reflects the increased attention on water and sanitation issues in the global political agenda. The 2030 Agenda lists rising inequalities, natural resource depletion, environmental degradation and climate change among the greatest challenges of our time. It recognizes that social development and economic prosperity depend on the sustainable management of freshwater resources and ecosystems and it highlights the integrated nature of SDGs.

This first synthesis report on SDG 6 seeks to inform discussions among Member States during the High-level Political Forum on Sustainable Development in July 2018. It is an in-depth review and includes data on the global baseline status of SDG 6, the current situation and trends at global and regional levels, and what more needs to be

done to achieve this goal by 2030. The report is based on the latest data available for the 11 SDG 6 global indicators¹ selected by Member States to track progress towards the eight global targets, plus complementary data and evidence from a wide range of sources.

B. Sustainable water and sanitation for all

Fresh water, in sufficient quantity and quality, is essential for all aspects of life and sustainable development. The human rights to water and sanitation are widely recognized by Member States. 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.

Water-related ecosystems and the environment have always provided natural sites for human settlements and civilizations, bringing benefits such as transportation, natural purification, irrigation, flood protection and habitats for biodiversity. However, population growth, agricultural intensification, urbanization, industrial production and pollution, and climate change are beginning to overwhelm and undermine nature's ability to provide key functions and services. Estimates suggest that if the natural environment continues to be degraded and unsustainable pressures put on global water resources, 45 per cent of the global gross domestic product, 52 per cent of the world's population and 40 per cent of global grain production will be put at risk by 2050. Poor and marginalized populations will be disproportionately affected, further exacerbating rising inequalities.

Agriculture (including irrigation, livestock and aquaculture) is by far the largest water consumer, accounting for 69 per cent of annual water withdrawals globally. Industry (including power generation) accounts for 19 per cent and households for 12 per cent. All these water uses can pollute freshwater resources. Most wastewater from

“Fresh water, in sufficient quantity and quality, is essential for all aspects of life and sustainable development. The human rights to water and sanitation are widely recognized by Member States. 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.”

¹ Data relating to targets are based on the latest data drives from 2015 (water, sanitation and hygiene data, and most MoI data) and 2017, or previously collected data.

municipal, industrial and agricultural sources is discharged back into water bodies without treatment. If not treated, this pollution further reduces the availability of fresh water for drinking and other uses, and also degrades ecosystems.

There is a growing consensus that the challenges can be met by adopting a more integrated approach to managing and allocating water resources, including the protection of ecosystems upon which societies and economies depend. The concept of integrated water resources management (IWRM) is embedded in the 2030 Agenda and requires governments to consider how water resources link different parts of society and how decisions in one sector may affect water users in other sectors. It is an approach that must involve all actors and stakeholders, from all levels, who use and potentially pollute water so that it is managed equitably and sustainably.

C. Achieving Sustainable Development Goal 6 targets

SDG 6 includes eight global targets that are universally applicable and aspirational. However, each government must decide how to incorporate them into national planning processes, policies and strategies based on national realities, capacities, levels of development and priorities. They cover the entire water cycle including: provision of drinking water (target 6.1) and sanitation and hygiene services (6.2), treatment and reuse of wastewater and ambient water quality (6.3), water-use efficiency and scarcity (6.4), IWRM including through transboundary cooperation (6.5), protecting and restoring water-related ecosystems (6.6), international cooperation and capacity-building (6.a) and participation in water and sanitation management (6.b).

This report recognizes that monitoring progress towards achieving SDG 6 is a learning process of review and improvement, that the selection of indicators, data collection and methodologies represent work in progress, and that countries are at different stages in developing their monitoring and reporting mechanisms. Less than half of Member States have comparable data available on progress towards meeting each of the global SDG 6 targets. Almost 60 per cent of countries do not have data available for more than four global SDG 6 indicators, and only 6 per cent reported on more than eight global indicators, representing a major knowledge gap. Water, sanitation and hygiene (WASH) targets have accumulated data since 2000 during the Millennium Development Goal period, whereas most other targets have a much shorter history of data acquisition.

1. Target 6.1: Achieve access to safe and affordable drinking water

Achieving universal access to safe and affordable drinking water by 2030 presents a huge challenge for all countries, not just those with low incomes. The proportion of the global population using at least a basic drinking water service increased from 81 per cent in 2000 to 89 per cent in 2015. However, only one in five countries below 95 per cent coverage is on track to achieve universal basic water services by 2030. Achieving target 6.1 means addressing the “unfinished business” of extending services to 844 million people who still lack even a basic water service, and progressively improving the quality of services to 2.1 billion people who lack water accessible on premises, available when needed and free from contamination (safely managed drinking water). It also implies going beyond households and providing access to services in schools, health-care facilities and other institutional settings.

The commitment to “leave no one behind” will require increased attention on disadvantaged groups and efforts to monitor elimination of inequalities in drinking water services. Disaggregated data on basic services are available for a growing number of countries (80), by rural and urban area, wealth group and subnational region. This enables governments to better identify and target disadvantaged groups, but further work is required to disaggregate estimates for safely managed services.

In those countries where a large proportion of the population still lacks even a basic drinking water service, the initial focus must remain on ensuring that everyone has access to an improved drinking water source and reducing the time spent (primarily by women and girls) collecting water. Further work is also needed to establish a commonly agreed method for assessing affordability, as payment for services should not be a barrier to accessing services.

2. Target 6.2: Achieve access to sanitation and hygiene and end open defecation

Achieving universal access to adequate and equitable sanitation and hygiene by 2030 is a major challenge in many parts of the world. Target 6.2 calls for countries to end open defecation, to ensure that everyone has access to a basic toilet and to put in place systems for safe management of excreta. The proportion of the global population using at least a basic sanitation service increased from 59 per cent in 2000 to 68 per cent between 2000 and 2015. However, 2.3 billion people still lacked basic services, 70 per cent were in rural areas, and just 1 in 10 countries below 95 per cent coverage is on track

to achieve universal coverage by 2030. Furthermore, 4.5 billion people worldwide lacked a safely managed sanitation service in 2015, where excreta were safely disposed of in situ or treated off-site.

Target 6.2 also highlights the importance of hygiene and calls for special attention to the needs of women and girls. Handwashing with soap and water is widely recognized as a top priority for reducing disease transmission. The global status is not yet known, but least developed countries (LDCs) had the lowest coverage: only 27 per cent had basic handwashing facilities, although coverage was higher in urban areas at 39 per cent.

Some 892 million people still practise open defecation. Between 2000 and 2015, the total fell from just over 1.2 billion. Of those who still practise open defecation, 90 per cent lived in rural areas, and the majority lived in just two regions with 558 million in Central Asia and Southern Asia and 220 million in sub-Saharan Africa. A substantial effort will be needed to end this practice by 2030.

Substantial investment will be required, particularly in rapidly growing urban areas, although solutions will vary depending on the relative importance of sewerage networks and on-site sanitation systems. Strengthening the capacity of local and national authorities to manage and regulate sanitation systems will be a high priority, including the development of information management systems, especially in low- and middle-income countries.

3. Target 6.3: Improve water quality, wastewater treatment and safe reuse

Collecting, treating and reusing wastewater from households and industry, reducing diffuse pollution and improving water quality are major challenges for the water sector. Ambient freshwater quality is at risk globally. Freshwater pollution is prevalent and increasing in many regions worldwide. Preliminary estimates of household wastewater flows, from 79 mostly high- and high-middle-income countries, show that 59 per cent is safely treated. For these countries, it is further estimated that safe treatment levels of household wastewater flows with sewer connections and on-site facilities are 76 per cent and 18 per cent, respectively.

Although water quality problems are largely associated with developing countries, they also persist in developed countries and include the loss of pristine quality water bodies, impacts associated with changes in hydromorphology, the rise in emerging pollutants and the spread of invasive species.

The extent of industrial pollution is not known, as discharges are poorly monitored and seldom aggregated at national level. Although some domestic and industrial

wastewater is treated on site, few data are available and aggregated for national and regional assessments. Many countries lack the capacity to collect and analyse the data needed for a full assessment. Reliable water quality monitoring is essential to guide priorities for investment. It is also important for assessing the status of aquatic ecosystems and the need for protection and restoration.

Increasing political will to tackle pollution at its source and to treat wastewater will protect public health and the environment, mitigate the costly impact of pollution and increase the availability of water resources. Wastewater is an undervalued source of water, energy, nutrients and other recoverable by-products. Recycling, reusing and recovering what is normally seen as waste can alleviate water stress and provide many social, economic and environmental benefits.

4. Target 6.4: Increase water-use efficiency and ensure freshwater supplies

Few countries have the natural and financial resources to continue increasing water supplies. The alternative is to make better use of available resources. This target addresses the issue of water scarcity and the importance of increasing water-use efficiency, with the latter being a measure of the value of water to the economy and society in units of United States dollars per cubic metre (US\$/m³) of water used.

More than 2 billion people live in countries experiencing high water stress. It affects every continent, hinders sustainability, and limits social and economic development. Although the global average water stress is only 11 per cent, 31 countries experience water stress between 25 per cent (when stress begins) and 70 per cent, and 22 countries are above 70 per cent and are seriously stressed. The highest stress levels occur in Northern Africa and in Western, Central and Southern Asia. Sub-Saharan Africa has a stress level of only 3 per cent, but this figure hides the large differences between the wetter and drier parts of the region. Levels of stress are likely to increase as populations and the demand for water grow and the effects of climate change intensify.

Agriculture is by far the largest water consumer, accounting for nearly 70 per cent of all withdrawals globally and as much as 90 per cent in some arid countries. Saving just a fraction of this can significantly alleviate water stress in other sectors. Alternative water sources, such as wastewater, storm run-off and desalination, can also relieve water stress. Safe wastewater reuse and recycling is a significant untapped resource for industry and agriculture, but its use must overcome political and cultural barriers. Another option is to import food grown in water-rich countries, but this may conflict with political sensitivities as countries seek food security in terms of self-sufficiency.



Sewage. Photo/Trey Ratcliff Creative Commons

The water-use efficiency is 15 US\$/m³ globally, but values range from as little as 2 US\$/m³ for countries whose economies depend on agriculture, to 1,000 US\$/m³ in highly industrialized, service-based or other economies that are dependent on natural resources. This information is not sufficient to define detailed policies and to take specific operational decisions to improve the grass-roots efficiency of various water users. Additional indicators reflecting those uses would therefore be most helpful. Indicators that reflect improvements in water productivity and irrigation in agriculture, and reduced losses in municipal distribution networks, industrial and energy cooling processes, are among the main issues that such indicators should monitor.

5. Target 6.5: Implement integrated water resources management

The 2030 Agenda fully commits Member States to IWRM and transboundary cooperation over shared water resources. Putting this into practice will be the most comprehensive step that countries make towards achieving SDG 6. Some 80 per cent of countries reported from all regions and on all levels of development. The global average degree of implementation of IWRM was 48 per cent (medium-low), but there were great variations among countries. Only

25 per cent of countries in the three lower human development index (HDI) groups reached the medium-low classification. Modest progress is being made, but most countries will not meet the target by 2030 at current rates of implementation. If the components of IWRM are broken down, most progress towards implementation is found in cross-sectoral coordination and public participation at national level (62 per cent), but financing (33 per cent), gender issues (33 per cent) and aquifer management (41 per cent) are areas of concern. There is no universal approach to implementing IWRM, and each country must develop its own pathway based on political, social, environmental and economic circumstances.

Water offers an opportunity for cooperation between countries rather than a source of conflict. Implementing IWRM at the transboundary level demonstrates the critical need to strengthen cooperation over shared water resources. The average of the national percentage of transboundary basins covered by an operational arrangement is 59 per cent (based on 2017/2018 data from 61 out of 153 countries sharing transboundary waters). However, the operational agreements and the joint bodies established were diverse and demonstrated that, while based on principles of customary law, there is no universal solution for what these should look like. Countries reported barriers to reaching agreement. These included: lack of political will and power asymmetries among riparian

“The main challenge across the water sector is to enable and accelerate progress towards achieving SDG 6, based on the findings from assessment of progress on SDG 6 targets. The water sector is struggling to improve water resources management and to increase the coverage and quality of water and sanitation services. Some of the many challenges are practical actions that provide the “visible” side of water, such as installing taps and toilets, building reservoirs, drilling boreholes, and treating and reusing/recycling wastewater. However, some actions are much less visible.”

countries; fragmented national legal, institutional and administrative frameworks; lack of financial, human and technical capacity; and poor data availability, especially in relation to transboundary aquifers and their boundaries.

6. Target 6.6: Protect and restore water-related ecosystems

Historically, the drive for economic and social development has depended on exploiting natural resources, including water-related ecosystems. Today, as the demand for fresh water increases, awareness is focusing on ensuring that the limited capacity of the natural environment to sustain the multiple services that society has come to rely on is maintained. Water-related ecosystems underpin other SDGs, and yet they also depend on them, particularly those relating to food and energy production, biodiversity, and land and sea ecosystems. Protecting and restoring water-related ecosystems cannot be achieved without progress on these other goals and vice versa.

The world has lost 70 per cent of its natural wetland over the last century, including significant loss of freshwater species. Artificial water bodies such as reservoirs, dams and rice paddies have been increasing in most regions, but current data-collection systems do not differentiate between natural and artificial water bodies. Reports suggest that the global data currently collected through the SDG process do not reflect the general state or trends known about freshwater ecosystems from other data sources. The global indicator is helpful but broad. Insufficient data are generated by countries to adequately measure progress. Further detailed data will be essential for accurate understanding of water-related ecosystems and the benefits they provide. Earth observations can complement local ground data and support the national burden of data acquisition and reporting.

Member States will need to strengthen capacity, increase financial resources, and implement clear roles and responsibilities for data collection and processing. Monitoring at the ecosystem level and at the basin scale is important. Local-

level monitoring provides evidence for practical action, and larger basin-level monitoring provides an overall perspective.

7. Target 6.a: Expand international cooperation and capacity-building

Expanding international cooperation and support for capacity development is fundamental and contributes to achieving many goals including SDG 6. Over 80 per cent of participating countries in the 2016/2017 cycle of the UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS) reported insufficient financing to meet national WASH targets. The need for increased financial resources to reach SDG targets 6.1–6.6 is clear.

Funding has increased across the water sector since 2005, as aid for agricultural water resources has nearly tripled. However, water sector official development assistance (ODA) has remained constant at around 5 per cent as a proportion of the total ODA disbursements. Total water sector ODA disbursements increased from US\$7.4 billion in 2011 to US\$9.0 billion in 2016.

Current data are not sufficient to assess the extent to which ODA is included in government-coordinated spending plans. It is expected that the monitoring framework for this target will develop over time. There is a need to better understand the extent and value of international cooperation, particularly support for capacity development, as this is currently not part of the indicator. Both the target and the indicator are strongly focused on external support and refer to the potential and need for stronger domestic engagement. Defining additional indicators or modifying indicators to take account of this should be considered.

8. Target 6.b: Support stakeholder participation

Effective and sustainable water management depends on the participation of a range of stakeholders, including

local communities. Over 75 per cent of countries reported having clearly defined policies and procedures in place for service users and communities to participate in planning programmes for drinking water supply (urban: 79 per cent, rural: 85 per cent) and sanitation (urban: 79 per cent, rural: 81 per cent). For water resources planning and management, 83 per cent of reporting countries had policies and procedures in place.

Monitoring participation was limited prior to approval of SDGs, and the monitoring framework for this target is still under development. The target needs to recognize that participation cannot be measured by quantity alone. A clearer set of indicators is needed that includes the quality of participation, such as nature, effectiveness and value.

Progress monitoring is dominated by information from the WASH sector, because of the extensive availability of GLAAS data. However, data from other areas such as IWRM were included in the latest cycle of data collection (2016/2017), although trend data are still lacking. Refined monitoring is needed to give a "voice" to groups in other sectors, particularly in agriculture where there is a long tradition of farmer participation in water user associations.

D. Enabling and accelerating progress

The main challenge across the water sector is to enable and accelerate progress towards achieving SDG 6, based on the findings from assessment of progress on SDG 6 targets. The water sector is struggling to improve water resources management and to increase the coverage and quality of water and sanitation services. Some of the many challenges are practical actions that provide the "visible" side of water, such as installing taps and toilets, building reservoirs, drilling boreholes, and treating and reusing/recycling wastewater. However, some actions are much less visible. They are far more challenging and highly complex, and yet they underpin the visible side of water. They include the need for good water governance, which is crucial for implementing IWRM, resolving the challenges of sharing water and the benefits it provides across national boundaries, and tackling the thorny issue of inequality where the rich have better water services than the poor, and wealthy landowners control water, which reduces the productivity of smallholders.

SDG 17 (*Strengthen the means of implementation and revitalize the global partnership for sustainable development*) offers a framework for enabling and accelerating progress in all aspects of SDG 6, including the challenging issues of IWRM and eliminating inequalities, which will be essential for achieving SDG 6 and leaving no one behind. MoI for water and sanitation include governance, finance,

capacity development and data acquisition and monitoring. These are interlinked, and effective policies in each activity are mutually reinforcing. They are all essential elements in meeting SDG 6 targets.

1. Governance

Good water governance is an essential pillar for implementing SDG 6. Yet governance structures tend to be weak and fragmented in many countries. Good water governance provides the political, institutional and administrative rules, practices and processes for taking decisions and implementing them.

Governments have responsibility for many governance functions, such as formulating policy, developing legal frameworks, planning, coordination, funding and financing, capacity development, data acquisition and monitoring, and regulation. However, governance is increasingly moving beyond government and taking account of cooperation with other stakeholders including the private sector. Good water governance comprises many elements, but it principally includes: effective, responsive and accountable State institutions that respond to change; openness and transparency providing stakeholders with information; and giving citizens and communities a say and role in decision-making.

Participation and multi-stakeholder engagement are important parts of policy processes, although measuring their effectiveness is still in its infancy. The importance of having a transparent, universal and neutral platform for government and citizen groups in place to mobilize available resources and seek alternative means of ensuring improved water services has proven to be essential and complementary to local government support. The importance of capacity becomes an important element in how policy is created and carried out in practice.

(a) Integrated water resources management

Good water governance is the key to implementing IWRM. As pressure on water resources has increased over the past 25 years, the demand for greater cooperation across the water sector has grown. The concept of IWRM has gradually been accepted and is embedded in the 2030 Agenda (target 6.5). IWRM defines the enabling environment for integration, the need for a strong institutional framework (including participation), the need for management instruments for effectively managing water resources (including those shared across national boundaries), and financing requirements for water resources development and management.

IWRM is a relatively simple concept but putting it into practice is complex. There is no universal solution, and each country must seek its own unique approach. Guidance can come from experiences in other countries



A girl closes a pit latrine in a small village between Gabú and Bafatá Regions which had just been declared open-defecation free. Photo/© UNICEF/UNI137336/LeMoyné

pursuing integration. Progress is linked with the state of the national economy and the level of effective governance, although a low HDI should not necessarily be a barrier.

Implementing IWRM at the transboundary level provides further justification for the critical need to strengthen cooperation over shared water resources and the benefits they provide. Countries need to cooperate to ensure that transboundary rivers, lakes and aquifers are managed in an equitable and sustainable manner.

(b) Eliminating inequalities

Good water governance underpins the elimination of inequalities. Equal access to sufficient safe and affordable water, and adequate and equitable sanitation and hygiene, can mean the difference between prosperity and poverty, well-being and ill-health, and even living and dying. Poverty has significantly decreased and access to WASH services has increased over the past 20 years. But inequalities have continued to increase; they are at an all-time high and affect almost every country. Richer people generally have better WASH access than poorer people, and wealthy landowners often control water resources in ways that reduce the productivity of smallholder farmers. However, economic influence is only part of the picture. Inequalities in societies exist between urban and rural communities, within urban communities, and among different cultures and genders.

Only 62 per cent of people in LDCs have access to a basic drinking water service compared to 89 per cent of the global population. The disparity in basic sanitation services is even greater, where coverage in LDCs (32 per cent) is less than half the global average (68 per cent). Only 27 per cent of the population in LDCs had a basic handwashing facility at home. There are marked differences between fragile and non-fragile States, and rural communities lag behind those in the urban sector. Urban populations are growing rapidly, and slums can proliferate when growth is not well managed. Ethnicity is important in determining access to water and sanitation. Indigenous and tribal people comprise more than 15 per cent of the world's poor, although they account for less than 5 per cent of the world's population. They care for an estimated 22 per cent of the Earth's surface and protect nearly 80 per cent of the remaining biodiversity on the planet. Many countries are failing to implement policies that sufficiently target the most vulnerable. Few countries have financial measures in place to target these populations, at 27 per cent for drinking water and 19 per cent for sanitation services.

2. Finance

Financial needs in the water sector remain high. More funding is required, ranging from more-effective use of existing resources through to providing new financing paradigms to create greater opportunities for making rapid progress in

future years. Current financial resources are inadequate to achieve SDG 6. The World Bank estimated the annual capital costs of meeting SDG targets 6.1 and 6.2 as US\$114 billion per year. This does not include other SDG 6 targets. Nor does it include operation and maintenance, monitoring, institutional support, sector strengthening and human resources.

Investments in WASH bring social and environmental benefits, as do investments in other water and water-using sectors. Estimates of the annual costs of damage from flooding, inadequate WASH and water scarcity amount to US\$500 billion. This figure would be much higher if environmental costs could be valued and considered. The benefits of investing in water security should reduce these costs and promote growth, which can then provide revenue supporting further investment, thus creating a virtuous circle.

Development partners in the WASH sector identified three financial challenges: (1) lack of finance for strengthening the enabling environment and service delivery, (2) untapped use of repayable finance, including microfinance and blended finance, and (3) resources inadequately targeted towards the poor and vulnerable who are unable to access services.

Bridging the finance gap necessitates improving the efficiency of existing financial resources, while increasing innovative sources of financing, such as commercial and blended finance, including the private sector. An enabling environment is therefore needed that considers the specialities of water investments (e.g. large upfront capital needs, long terms or associated risk management). ODA is crucial, but it needs targeting where it can be most effective and used to catalyse other funding sources.

The World Bank has stated that these actions are self-reinforcing in the WASH sector. Improving the use of existing resources, when coupled with implementing reforms, should lead to increased efficiencies, improved services and increased credit worthiness. This can lead to increased access to repayable and commercial financing, which can then be invested in further service improvements, thus continuing the cycle.

3. Capacity development

Strong formal and informal institutions and human resources underpin good water governance. However, an acute lack of capacity is constraining water resources development and management in all its facets, across most developing countries, particularly in sub-Saharan Africa and South and South-eastern Asia. Human resource shortages are reported in all key areas, including: agriculture and irrigated farming; water-related risk management; water and sanitation services; wastewater treatment, recycling and reuse technologies; and desalination. This is not a new phenomenon and has been a leading concern and constraint on water-related development for many decades.

Several countries are now producing national capacity development strategies for the water sector. However, the big challenge is implementation. There are means of rapidly increasing vocational skills to meet specific shortages using short-term programmes of two to four years in length. But it takes many years to strengthen institutional capacity with a cadre of experienced and effective professionals and technicians that can plan and enable progress towards SDG 6. The answer lies in long-term commitment and support for knowledge and capacity development.

4. Data acquisition and monitoring

Data underpin the governance elements of accountability, transparency and participation. They enable progress to be monitored and service providers, governments and development partners to be held accountable. Many countries lack the financial, institutional and human resources to acquire and analyse data to support governance. Less than half of Member States have comparable data available on progress towards meeting each of the global SDG 6 targets.

Stakeholders have no basis for challenging factually incorrect or biased positions without available data. Reliable, consistent and, whenever possible, disaggregated data are essential to stimulate political commitment, inform policymaking and decision-making, and trigger well-placed investments towards health, environment and economic gains. Data acquisition and monitoring requires political commitment to transparency that includes efforts related to accessibility and sharing of data. Increased utilization of the latest Earth observations, citizen science and private sector data should be incorporated into data-monitoring systems at all levels to complement existing data-collection efforts.

E. Beyond Sustainable Development Goal 6

The integrated approach to the 2030 Agenda recognizes that most aspects of society, development, sustainable growth and the environment are symbiotic. Accepting this can make development more cost-effective, help to maximize synergies and reduce the risks that actions taken to meet one goal will undermine other goals. It will also ensure appropriate timing and sequencing of policy and institutional reforms and related investments, so that limited resources are used efficiently and sustainably. An integrated approach has important implications. It means that progress towards SDG 6 can enable and drive progress in most other SDGs; equally, the success of SDG 6 will also depend on most other SDGs meeting their targets.

1. Water and society

The transformative vision and ambition of Member States to end poverty and hunger everywhere, to combat inequalities within and among countries, to build peaceful, just and inclusive societies, and to protect human rights everywhere is at the heart of the 2030 Agenda. Water is central to achieving this vision and ambition. It is essential for society's health and well-being, ending hunger, achieving food security and improving nutrition.

Safe drinking water, and adequate sanitation and hygiene, are fundamental to protecting health, and directly contribute to achieving good health and well-being. Water-related diseases are closely linked to poverty, and disproportionately affect vulnerable communities that do not have access even to basic WASH services. Universal access to WASH is essential for ending preventable deaths from diarrhoea and other water-related diseases, and for improving nutrition, health service delivery, social well-being and economic productivity. Estimates suggest that every US\$1 invested in WASH yields a US\$5 return, considering all social and economic benefits. Inequalities must be eliminated and rates of progress increased for those furthest behind, if WASH targets are to be met by 2030. This includes people in rural areas, and communities where neglected tropical diseases are endemic and "hotspots" where outbreak of diseases such as cholera recur.

Schools have an important role to play. Improving access to WASH in schools can enhance pupil and teacher health, school attendance and welfare, which benefits educational outcomes for all. This is particularly beneficial for girls and young women with regard to menstrual hygiene management. School pupils are well placed to learn about safe water and sanitation, both in practice and in the classroom, so that they and their families can understand the links among water, health and nutrition.

Access to WASH, together with food security, can reduce infections that exacerbate undernutrition. Poor WASH contributes to undernutrition, which is both a rural and an urban health issue (but which is worse in rural communities). It is endemic among the poor in sub-Saharan Africa and Asia, where many people live in insanitary conditions and do not get enough calories, protein and micronutrients in their diet. Almost 25 per cent of children under the age of five was stunted and 10 per cent was wasted in 2016.

Women are the predominant caretakers of domestic water, collecting it for household use and irrigating crops. Many women in poor households bear the burden of retrieving water from distant sources and often have little option but to use polluted wastewater for domestic purposes. Their role in societies and within their families means that they

are often critically exposed to unsafe water and are most affected by the lack of adequate sanitation facilities and/or sufficient wastewater management.

Women need much greater engagement in decision-making about WASH infrastructure and services; they need to be asked about location, design and management of water points and toilet facilities. Women and men need to be equally represented on WASH committees, service providers and water user associations, and a concerted effort is required to promote more women in leadership positions. National and local governments therefore need to integrate gender issues into their policymaking and decision-making and enable women to have an effective voice and engage in meaningful participation.

Water is an essential ingredient in agriculture and food production. It is intrinsic to ending hunger, achieving food security, improving nutrition and promoting sustainable agriculture. Most water withdrawals are in the agriculture sector. Therefore, water shortages and scarcity can seriously affect agriculture and food production, particularly in vulnerable developing countries, where the demand for food is increasing and undernutrition is endemic. World hunger is rising again now, following a prolonged period of decline, as more people suffer food insecurity. This is especially noticeable in sub-Saharan Africa, which experiences the highest level of food insecurity, affecting almost 30 per cent of the population. Conflict and fragility have also worsened food security and are often compounded by floods and droughts, both of which can devastate crops and harvests.

2. Water and the environment

Ecosystems and their inhabitants, including humans, are water users. Water-related ecosystems include wetlands, rivers, aquifers and lakes, and sustain a high level of biodiversity and life. They are vital for providing benefits and services such as drinking water, water for food and energy, humidity, habitats for aquatic life, and natural solutions for water purification and climate resilience. They contribute to addressing competing demands, mitigating risks and promoting stability and trust-building measures, if they are managed well. They are therefore essential for sustainable development, peace, security and human well-being.

Water-related ecosystems are increasingly under threat, as the demand grows for fresh water for agriculture, energy and human settlements. They endure effects from pollution, infrastructure development and resource extraction. Degrading ecosystems can also lead to conflict, displacement and migration.

Water quality is diminishing as pollution from pathogens, organic matter, nutrients and salinity increase due to lack of properly managed sanitation, and indus-

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trial and agricultural run-off. Land and freshwater ecosystems are totally interdependent. Land-based ecosystems depend on freshwater resources in sufficient quantity and quality; in turn, activities on land, including land use, influence water availability and quality for people, industry and ecosystems. Poor water quality degrades freshwater habitats and coastal areas and can affect fishers, thus influencing both biodiversity and food security.

Interest is growing in nature-based solutions (NBSs), which use or mimic natural processes to increase water availability (e.g. soil moisture retention and groundwater recharge), improve water quality (e.g. natural and constructed wetlands and riparian buffer strips), and reduce water-related risks by restoring flood plains and constructing decentralized water retention systems such as green roofs.

Agriculture is both a leading cause and a victim of water pollution. Agricultural water withdrawals are consumed by crops, but some water is returned to water bodies, resulting in pollution. The lack of water treatment from domestic and industrial sources also makes agriculture a victim, as polluted water contaminates crops and transmits disease to consumers and the people involved in food production and processing.

Much of the pollution affecting oceans and coastal zones comes from human activities and poorly managed land-use practices. This also applies to solid waste dumped at or near coastal areas, which eventually ends up in the sea. Reducing pollution and minimizing dumping of hazardous materials into upstream ecosystems will benefit marine environments and reduce the impact on coastal ecosystems.

Climate change has a significant impact on freshwater systems and their management. Most effects due to climate change will be experienced through changes in the hydrological cycle, such as overall water availability, water quality and frequency of extreme weather events (e.g. floods and droughts). Water-related hazards account for a large part of disaster loss and impact. Between 1990 and 2015, more than 1.6 million people died, and 5.5 billion people affected in

internationally reported natural hazards. Water-related hazards accounted for 62 per cent of the deaths and 96 per cent of the people affected and 75 per cent of total damage costs amounting to US\$2.5 trillion.

While floods are immediate and visible and receive much attention, droughts are a creeping phenomenon, like climate change. They contribute to overall water scarcity, stress water supplies, and affect agriculture and aquatic ecosystems. Proactive drought policies and drought risk management can build greater societal resilience to the effects of drought and reduce the need for an emergency response. But this requires a fundamental shift in the way droughts are perceived and managed. Overall, climate change, and its exacerbation of floods and droughts, necessitates a more adaptable approach to water management for countries and societies to be able to cope with the increasing uncertainty.

Water stress (scarcity) is linked to hunger and food insecurity. Countries need to improve water productivity and water-use efficiency to overcome water shortage and scarcity, especially those facing high water stress. An important option for water savings is to reduce high levels of food loss and waste, which could save the resources used to produce them for other productive purposes.

Cities and towns present a special and major water challenge, as they are expected to be home for some 66 per cent of the world’s population by 2050. Increasing urbanization and deteriorating infrastructure inhibit progress. So does the growth in peri-urban slum populations where there is only limited access to safe water and sanitation and which are linked to poverty, gender equality, and health and nutrition problems. Cities do not function in isolation; they exist within river basins and what happens in cities affects others downstream and vice versa.

Migration (often partly caused by environmental degradation and water insecurity) adds to the pressure on water resources. Unemployment across many Arab States has worsened in recent years as rural incomes have fallen due to drought, land degradation and groundwater depletion, resulting in low agricultural productivity. This has fuelled rural to urban migration, expanded informal settlements and increased social unrest. The loss of agricultural jobs jeop-



Vietnamese farmers and water buffaloes work on rice fields. UN Photo/Kibae Park

ardizes agricultural livelihoods and economic opportunities, which particularly affects younger generations and vulnerable members of society. Migrants can place great burdens in countries where existing resources are often limited, poorly managed and overexploited.

3. Water and the economy

Economic growth is still the priority for most countries. SDGs cannot be met without growth, which tends to overshadow other issues. But unsustainable use of water and land resources will not help to meet these targets. Climate change is focusing minds on sustainability and the fact that the natural resources of future generations are being consumed to satisfy the economic demands of today.

Although water is widely accepted as being important to economic growth, recent studies have helped to quantify and confirm this relationship. However, determining how water-related investments affect growth is fraught with difficulties because of the many pathways that lead to

growth and the pervasive way in which water is an input into so many economic activities. The findings confirm that water insecurity acts as a major constraint to global economic growth.

About 1.4 billion livelihoods globally are directly dependent on water, including jobs in the food and beverage industry, the energy industry and the water industry. Millions of smallholder farmers in developing countries rely on water for irrigation and livestock farming for their livelihoods.

Agriculture is a major industry, employing about 30 per cent of the global workforce. Agriculture is treated like any other industrial business in developed countries. Only 1.5 per cent of the nation's workforce is employed in agriculture in the United Kingdom of Great Britain and Northern Ireland. But the wider agrifood industry, which relies on agriculture for its raw materials, employs 14 per cent of the nation's workforce and is worth US\$145 billion to the national economy. However, uncertainty over future water supplies for agriculture is leading to greater uncertainty among agrifood busi-

nesses and may act as a disincentive to future growth and investment. These issues are reflected across many similar industrialized countries.

Agriculture is the mainstay of economic growth in many developing countries and is the leading consumer of water. Millions of smallholder producer farmers, more than 60 per cent of the workforce in sub-Saharan Africa, are involved in agriculture-related activities. Agricultural production and the economy in sub-Saharan Africa largely depend on the vagaries of sparse and unreliable seasonal rainfall. Most countries face a combination of high hydrological variability, a lack of investment in water infrastructure and weak water governance. Irrigated agriculture is an option for only some.

Water quality is of equal concern as water quantity for the manufacturing industry. Most industrial processes degrade water quality. Industries in modern economies have statutory duties to clean up their effluents to national and international standards before discharging into receiving water bodies such as lakes, rivers or the sea. Many industries in developing countries still discharge untreated or partially treated effluent, which raises concerns about pollution from toxic metals and organic compounds. Those pollutants that are harmful to people and the environment in places where regulatory systems are ill-equipped to deal with them are of concern.

Industrial water demand in Europe is decreasing; it has levelled in North America, although demand is much higher than in other regions. Demand continues to rise in Australia and Oceania, Asia, South America and Africa. The challenge is for developed nations to lower industrial water use and for developing countries to industrialize without substantially increasing water demand and water pollution.

Water and energy are closely associated. WASH services, agriculture and industry all need energy for pumping water, treating wastewater, irrigating crops and desalination. The energy sector also needs water to cool thermal power plants, provide hydropower and grow biofuels. A 48 per cent increase in global energy consumption is expected by 2040 (above 2012 levels), mostly in China, India, South-east Asia, parts of Africa, Latin America and the Middle East. Energy demands in the water sector are increasing as more farmers exploit groundwater for irrigation, and substantial increases in water treatment are expected in order to meet SDG 6 targets. Most wastewater in developing countries is untreated. If this is to be halved by 2030 to meet SDG 6 targets, substantial amounts of additional energy will be needed if traditional methods of treatment are applied. A potential bonus is that the energy contained in wastewater is about 5–10 times greater than the energy needed to treat it. Innovative methods are required to extract and use it.

F. Key messages

1. Integrating Sustainable Development Goal 6 into the 2030 Agenda

- **Achieving SDG 6 is essential for progress on all other SDGs and vice versa.** Sustainable management of water and sanitation underpins wider efforts to end poverty, advance sustainable development and sustain peace and stability.
- **The time to act on SDG 6 is now.** The world is not on track to achieve the global SDG 6 targets by 2030 at the current rate of progress.
- **Global SDG 6 targets must be localized and adapted to the country context.** National governments must decide how to incorporate SDG 6 targets into national planning processes, policies and strategies, and set their own targets, taking into account local circumstances.
- **Effective water resources management needs more and better data.** Data underpin good water governance. Less than half of Member States have comparable data available on progress made towards SDG 6 targets.

2. Understanding the baseline status and trends of the global indicators

- **Extending access to safe drinking water presents a huge challenge.** Achieving universal access to safe and affordable drinking water means providing basic water services to 844 million people and improving service quality to 2.1 billion people who lack safely managed drinking water services.
- **Billions of people still need access to basic toilet and handwashing facilities.** Over 2.3 billion people lack basic sanitation services, 892 million still practice open defecation and 4.5 billion people lack safely managed sanitation services. These will not be eradicated by 2030 with current trends. Only 27 per cent of the population in LDCs has access to soap and water for handwashing on premises.
- **Improving water quality can increase water availability.** Worsening water pollution must be tackled at source and treated to protect public health and the environment and to increase water availability.
- **Agriculture offers opportunities for significant water savings.** The agricultural sector accounts for nearly 70 per cent of global freshwater withdrawals. Saving just a fraction of this would significantly alleviate water stress in other sectors.

- **Implementing IWRM is an important comprehensive step towards achieving SDG 6.** Integration across the water and water-using sectors is essential for ensuring that limited water resources are shared effectively among many competing demands.
- **Sustaining water-related ecosystems is crucial to societies and economies.** The world has lost 70 per cent of its natural wetlands over the last century. Sustaining and recovering water-related ecosystems are vital for societal well-being and economic growth.
- **Improved international cooperation and more and better use of funding is needed.** Over 80 per cent of countries reports insufficient financing to meet national WASH targets. ODA funding is important, but so too is stronger domestic financial engagement, including the private sector, and better use of existing resources.
- **Public participation is critical to water management.** Community participation in decision-making can yield many benefits, but better means of measuring quality and effectiveness of such participation are needed rather than just relying on quantity of engagement.

3. Enabling and accelerating progress

- **Good water governance is essential.** Good water governance provides the political, institutional and administrative

rules, practices and processes for taking decisions and implementing them. It is key to implementing IWRM.

- **Inequalities must be eliminated.** Effective policies, strategies and subsidies must be developed to ensure that no one is left behind. The 2030 Agenda will not succeed if governments fail to support the most vulnerable people.
- **Water and sanitation require a new financing paradigm.** This means increasing the efficiency of existing financial resources and mobilizing additional and innovative forms of domestic and international finance.
- **Capacity must be developed.** A serious lack of institutional and human capacity across the water sector is constraining progress, particularly in developing countries. Investing in capacity development requires a long-term view as well as short-term measures.
- **Smart technologies can improve management and service delivery.** Smart technologies supported by information technology can effectively improve all aspects of water resources and WASH management.
- **Multi-stakeholder partnerships can unlock potential.** Sharing, accessing and adapting new solutions needs cooperation. SDG 6 provides the ideal platform for multi-stakeholder partnerships to ensure more effective and efficient progress on poverty reduction and sustainable development.