

SANITATION, DRINKING-WATER AND HEALTH IN PACIFIC ISLAND COUNTRIES

2015 UPDATE AND FUTURE OUTLOOK



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WHO Library Cataloguing in Publication Data

Sanitation, drinking-water and health in Pacific island countries : 2015 update and future outlook

1. Drinking water. 2. Sanitation 3. Hygiene. 4. Pacific Islands.

I. World Health Organization. Regional Office for the Western Pacific. II. United Nations Children's Fund.
III. The Pacific Community. Water and Sanitation Programme. IV. United Nations Human Settlements Programme.

ISBN 978 92 9061 747 1 (NLM Classification: WA 670)

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Acknowledgements

This report was prepared by the World Health Organization (WHO), in partnership with the United Nations Children’s Fund (UNICEF), the Water and Sanitation Programme of the Pacific Community (SPC) and the United Nations Human Settlements Programme (UN-Habitat). A working group with representatives of the four organizations provided guidance and support in the preparation of the report. The team was instrumental in preparing and reviewing the report, and included Sarah Mecartney (UN-Habitat); Dave Hebblethwaite (SPC), Christian Stärz (SPC/GIZ); Larissa Leben, Marc Overmars, Francis Wele, Brooke Yamakoshi (UNICEF); Gi Bang, Jose Hueb, Mitesh Mudaliar and Rokho Kim (WHO). Andrew Colin Parker (UNICEF) and Alexander von Hildebrand (WHO) also provided thoughtful and useful comments.

Rokho Kim and Marc Overmars jointly initiated and facilitated the working group and coordinated the preparation of this report. Jose Hueb was lead author of the report and Rokho Kim was managing editor.

The document was also reviewed by the following members of the JMP team: Tom Slaymaker (UNICEF), Richard Paul Johnston (WHO) and Francesco Mitis (WHO) who provided excellent and useful inputs to the final version of the document.

Abbreviations

ADB	Asian Development Bank
CHERG	Child Health Epidemiology Reference Group
ENSO	El Niño-Southern Oscillation
GDP	gross domestic product
GEF	Global Environment Facility
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
GWP	Global Water Partnership
HDI	Human Development Index
IFAD	International Fund for Agricultural Development
IPCC	Intergovernmental Panel on Climate Change
IWRM	Integrated Water Resources Management
JMP	WHO and UNICEF Joint Monitoring Programme for Water Supply and Sanitation
MDG	Millennium Development Goal
PWWA	Pacific Water & Wastes Association
RAP	Pacific Regional Action Plan on Sustainable Water Management
SDG	Sustainable Development Goal
SIDS	Small Island Developing States
SPC	The Pacific Community
SOPAC	The former Pacific Islands Applied Geoscience Commission (now the Geoscience Division of SPC)
UN	United Nations
UNCCD	United Nations Convention to Combat Desertification
UN-Habitat	United Nations Human Settlements Programme
UNICEF	United Nations Children's Fund
UNPD	United Nations Population Division
WASH	water, sanitation and hygiene
DWSP	Drinking-Water Safety Plan
WHO	World Health Organization

Foreword

The health consequences of poor water, sanitation and hygiene services are enormous. I can think of no other environmental determinant that causes such profound, debilitating, and dehumanizing misery.

Margaret Chan, WHO Director-General
Keynote address at Budapest Water Summit, 9 October 2013

About 6.9 million people in Pacific island countries cannot access improved sanitation. More than 4.8 million cannot access improved water supplies.

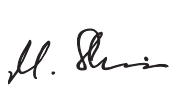
The United Nations General Assembly recognizes water and sanitation as basic human rights. The General Assembly has called upon governments and international organizations to provide financial resources, build capacity and technology transfer to provide safe, clean, accessible and affordable drinking-water and sanitation for all (UN Resolution A/RES/64/292).

This report was jointly prepared by the World Health Organization, the United Nations Children's Fund, the Pacific Community and UN-Habitat. According to the report, some Pacific island countries are unlikely to meet the Millennium Development Goal targets for drinking-water and sanitation.

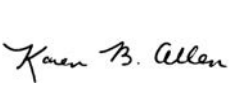
Basic sanitation and safe drinking-water are essential to alleviate poverty, attain sustainable economic and health development, and deliver primary health care. Without basic sanitation, poor hygiene and unsafe water supplies can lead to sickness, high health-care costs and death.

Pacific island countries face critical climate change challenges. These countries are among the most vulnerable in the world to increasing climate variability and extreme weather conditions.

Sustainable Development Goals were endorsed by the UN General Assembly, which include targets to ensure basic sanitation and safe drinking-water for all. To achieve these targets, strong commitment will be required across a broad range of stakeholders, including governments, international and nongovernmental organizations, the private sector and civil society. We must work together effectively to ensure a future in which all Pacific islanders enjoy access to good sanitation and safe drinking-water.



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Executive summary

Lack of adequate sanitation and water is most devastating for children, especially the poorest and most marginalized.

Anthony Lake, Executive Director of UNICEF at the 2014 High Level Meeting on Sanitation and Water for All, Washington DC

This report updates *Sanitation, hygiene and drinking-water in Pacific island countries: Converting commitment into action* (WHO, SOPAC, 2008). This report reviews the status of sanitation, drinking-water and hygiene in Pacific island countries and the challenges faced in meeting international targets. Information sources include the WHO and UNICEF Joint Monitoring Programme for Water Supply and Sanitation (JMP) which produces estimates of progress based on data from national censuses and household surveys.

The proportion of people using some type of improved sanitation in Pacific island countries rose from 29% in 1990 to 31% in 2015 (WHO, UNICEF, 2015a). With regard to drinking-water, the proportion of people using improved sources increased from 46% in 1990 to 52% in 2015. From 1990 to 2015, Pacific island countries experienced population growth of about 70%. Thus, the increase in the proportion of people served did not keep pace with population growth. This means that investments towards improved drinking-water and sanitation facilities in Pacific island countries have remained stagnant for more than two decades.

THE OBJECTIVES OF THIS REPORT ARE:

- to provide an overview of the status of sanitation, drinking-water and hygiene in Pacific island countries to support regional and national decisions concerning the sector;
- to take stock of water and sanitation sector development in the light of evidence-based statistics, regional and national resolutions and high-level commitments;
- to assess, in the light of statistics provided by the JMP, whether the Millennium Development Goals (MDGs) drinking-water and sanitation targets have been achieved;
- to look into the implications for Pacific island countries of the Sustainable Development Goals (SDGs) targets on drinking-water and sanitation; and
- to provide the basis for discussion and advocacy at all levels to accelerate investment to improve water, sanitation and hygiene in the Pacific region.

The statistics presented do not include detailed subnational information and thus do not capture the status of peri-urban areas. The rates of growth derived from national

census reports and other household surveys do not necessarily reflect trends in overall urbanization, but rather of the limits of growth within municipal/city boundaries. Peri-urban or semi-rural areas in the Pacific region are believed to have recorded the highest rates of population growth. This is confirmed by the dire situation in informal settlements. Considering the density and living conditions of these communities, health risks are high.

THIS REPORT COMPRISES 9 SECTIONS

SECTION 1

Pacific island countries in perspective

This section provides a succinct description of the Pacific region including the international framework for development.

SECTION 2

Sanitation coverage in Pacific island countries

This section presents an analysis of the status of sanitation in Pacific island countries including graphs, tables and maps showing how sanitation evolved from 1990 to 2015. This section also addresses the methodology used by the JMP to derive estimates of sanitation coverage.

SECTION 3

Drinking-water coverage in Pacific island countries

This section analyses the status of access to improved drinking-water in Pacific island countries including graphs, tables and maps. This section explains the methodology used by the JMP to derive estimates of drinking-water coverage.

SECTION 4

Towards and beyond the MDG targets

This section analyses the status of the Pacific island countries in attaining the MDG drinking-water and sanitation targets for the region and analyses the progress of Pacific island countries. The international community has adopted new SDGs which include ambitious targets for universal access to drinking-water and sanitation. This section considers some of the implications to the region in terms of efforts required to achieve such targets.

SECTION 5

Sanitation and drinking-water: powerful determinants of health

This section summarizes improved drinking-water and sanitation coverage in the region and includes a brief analysis of the demographic, health and social situation of the region. An attempt is made to demonstrate the links between drinking-water and sanitation and the health status of the population in the region.

SECTION 6

The challenge of urbanization in Pacific island countries

Pacific island countries are rapidly urbanizing. This section looks into the urban growth engines, driving significant social, economic and environmental change. This section addresses challenges for delivering services to Pacific urban populations.

SECTION 7

Climate and disaster risk

This section considers risks and initiatives to build resilience in sanitation, water and hygiene. This section emphasizes the need for action on climate change adaptation, resilience, and water and sanitation issues.

SECTION 8

Integrated water resources management

This section demonstrates that drinking-water and sanitation must be managed in Pacific island countries under the integrated water resources management (IWRM) perspective. This section addresses threats and actions taking into account the fragility of water resources in the region.

SECTION 9

Conclusions

This section analyses the conditions facilitating investment and accelerated development towards sustainable access to drinking-water and sanitation, as well as the constraints faced in the region.

A key finding of this report is that the Pacific region was unable to meet MDG target 7.C to “halve, by 2015, the proportion of people without sustainable access to safe drinking-water and basic sanitation”. Individually, more than half of Pacific island countries have not attained the MDG sanitation target.

About 6.9 million people in the region are not using improved sanitation facilities. About 4.8 million people are not using improved drinking-water sources.

Water-related diseases including diarrhoeal diseases and malaria are a significant cause of death of children under-5 in the region. Many other causes of death are also indirectly influenced by lack of basic sanitation, hygiene and safe drinking-water. Although treatment of diarrhoeal disease has reduced child mortality considerably, over 1000 people in the Pacific region still die annually due to diarrhoeal disease. The highest death rates among children occur in Kiribati and Papua New Guinea.

This report estimates that the infrastructure cost of achieving universal coverage with basic drinking-water by 2030 is about US\$ 83 million per annum. This amount is approximately 0.34% of the Pacific region’s GDP. Similarly, the infrastructure cost of achieving universal coverage with adequate sanitation by 2030 is about US\$ 80 million per annum, representing 0.24% of the region’s GDP.

A few basic principles should orient the water and sanitation sector in the years to come. First, water and sanitation solutions need to be sustainable, safe, and not adversely impact fragile water resources. Second, more needs to be done to empower small, isolated and informal communities to safely and sustainably manage their own drinking-water, sanitation and hygiene. Third, a significant increase in support is required to strengthen the capacity of Pacific island governments, utilities and communities to manage sustainable water and sanitation services in the face of human and financial resource constraints. Finally, safe and sustainable water and sanitation solutions are vital to strengthen and maintain the resilience of Pacific communities to the increasing threats of climate variability, climate change and natural hazards.



SECTION 1

Pacific island countries in perspective

1.1 Overview of Pacific island countries

Pacific island countries covered in this report are: Cook Islands, the Federated States of Micronesia, Fiji, Kiribati, Nauru, Niue, Palau, Papua New Guinea, the Marshall Islands, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu. These countries are part of a group of small island developing states (SIDS) globally that share similar sustainable development challenges. There are 10 million people living in the Pacific region, on islands scattered across 180 million square kilometres, an area 17 times larger than Europe. Over 81% of the total population lives in rural areas (United Nations, 2014).

To strengthen regional cooperation, Pacific island countries approved the Pacific Plan in 2005 (PIFS, 2014). The Pacific Plan has four pillars: economic growth; sustainable development; governance; and security. A review in 2009 added two themes: responding to climate change; and improving livelihoods and well-being (PIFS, 2014). Water security is a critical sustainable development issue for Pacific island countries, with profound impacts on lives and livelihoods, economic growth, public health, the environment and human rights.

The small size and geography of Pacific island countries create unique challenges in water and sanitation service provision. Many countries have limited water resources and inadequate capacity for resource management. Pressures of economic development and urbanization coupled with climate variability result in water shortages, flooding, soil erosion and deterioration of water quality (SOPAC, GWP, 2007).

Pacific island countries are further constrained by small economies, high material and service costs, and challenges in training and retaining human resources. The high transaction costs in the region further constrain national capacity for service delivery (Winters and Martin, 2004).

For many Pacific island countries, the availability of freshwater resources is confined to groundwater lenses, small streams and rainwater collected from roofs. These scarce resources are vulnerable to overexploitation and contamination, particularly in atoll environments, where limited potable groundwater sources can be threatened by over-exploitation, land use activities and inappropriate sanitation facilities. In particular, serious environmental health problems can arise from the use of water-borne systems

such as sewer pipe collection systems and septic tanks without proper wastewater treatment.

Pacific island countries are particularly vulnerable to the impacts of climate variability and change, and are subject to a relatively high frequency of hazards such as cyclones, earthquakes, floods and drought. The Fourth Assessment Report of the United Nations Intergovernmental Panel on Climate Change (IPCC, 2007) identified small island states as the most vulnerable in the world to the risk of disaster due to climate change. Achieving water security, sustainability and resilience in the face of potential shocks requires the use of all available water sources, including rainwater, groundwater, surface water and in some cases desalinated supply. The Fifth Assessment Report (IPCC, 2014) provides evidence of rising temperatures worldwide. This is of particular importance in the Pacific region, where human settlement is coastal and is exposed directly to storm activity, sea-level rise and changes in marine ecosystems. Pacific island countries face complex challenges of providing services to isolated rural communities and growing urban and peri-urban centres. For rural communities, drinking-water, sanitation and hygiene are primarily managed at the household or village level as there is often minimal access to public services. This calls for strengthened local community management of drinking-water and sanitation services.

1.2 Overview of the status of sanitation and drinking-water in Pacific island countries

The Pacific region has made little progress towards achieving the Millennium Development Goals (MDGs) target for water and sanitation. While all Pacific island countries made efforts to improve access to safe drinking-water and adequate sanitation, in many countries these efforts did not keep pace with population growth.

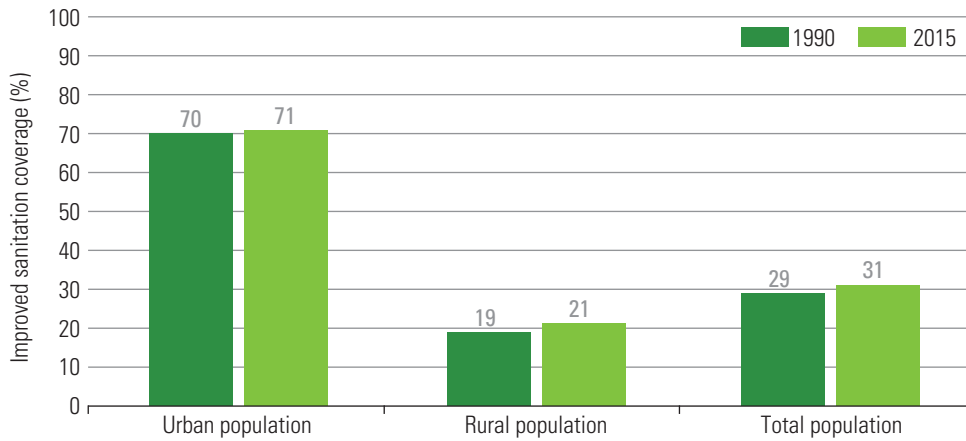
Only half of the population in the Pacific region use improved drinking-water sources whereas one-third of the population use improved sanitation (Fig. 1 and 2). This means that two-thirds of the region's population rely on unprotected sources of water and unsanitary means of excreta disposal that pose serious risks to health. Rapid population growth is likely to continue increasing pressure on basic services.

Figures 1 and 2 show the changes from 1990 to 2015 in the proportion of people using improved sanitation and drinking-water in the Pacific region. The proportion of people served with some type of improved sanitation rose from 29% in 1990 to 31% in 2015. Similarly, the proportion of people using improved drinking-water sources rose from 46% in 1990 to 52% in 2015. These marginal improvements indicate missed opportunities for water and sanitation in Pacific island countries for more than 20 years.

In urban areas of the Pacific region, about 3 in every 10 people do not use improved sanitation. In rural areas, 8 in every 10 people do not use improved sanitation.

Figure 1

Proportion of urban, rural and total population in the Pacific region using improved sanitation, 1990 and 2015



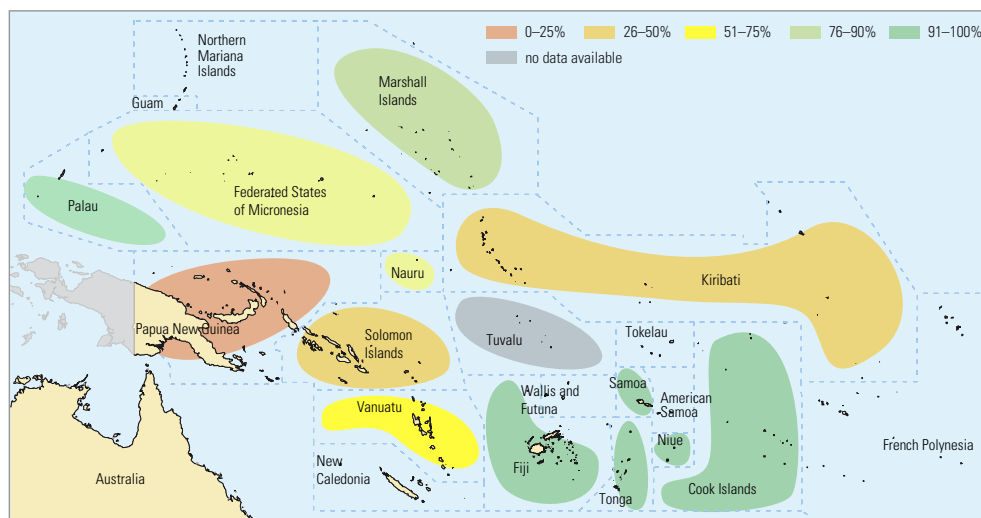
Source: country coverage data from UNICEF and WHO (2015)

Map 1 displays the status of improved sanitation coverage in Pacific island countries by grouping the different coverage figures in five percentile layers of coverage. Only one country has coverage below 25% and five countries have coverage above 90%.

Papua New Guinea has the lowest proportion of population using improved sanitation in the region.

Map 1

Pacific island countries: improved sanitation coverage, 2015



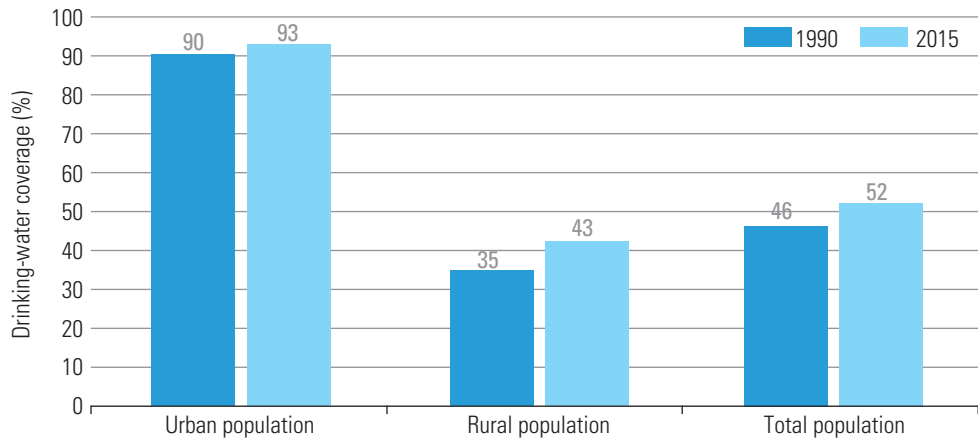
Source: country coverage from UNICEF and WHO (2015)

Use of improved drinking-water sources in urban areas has remained high. However, low rural coverage has resulted in low overall coverage for the region (Fig. 2).

Half of the population in the Pacific region does not use improved drinking-water sources.

Figure 2

Proportion of urban, rural and total population in the Pacific region using improved drinking-water sources, 1990 and 2015



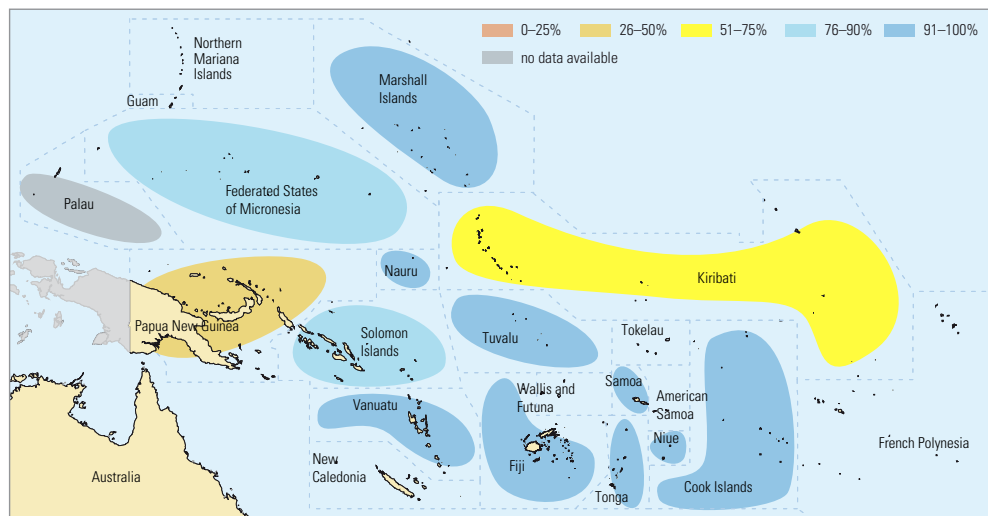
Source: country coverage data from UNICEF and WHO (2015)

Map 2 shows that improved drinking-water coverage is more than 90% in most countries.

Improved drinking-water coverage exceeds 90% in most Pacific island countries. However, coverage in Papua New Guinea is less than 50%.

Map 2

Pacific island countries: coverage with improved drinking-water, 2015



Source: country coverage from UNICEF and WHO (2015)

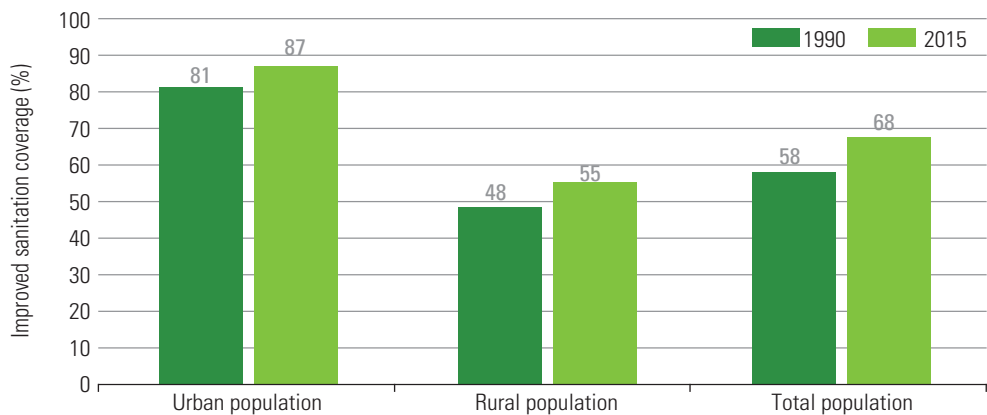
Figures 3 and 4 show the status of access to improved drinking-water and sanitation in the region, not including Papua New Guinea. Papua New Guinea accounts for about 70% of the regional population, considerably influencing regional statistics.

While, if Papua New Guinea is not included, regional coverage with improved drinking-water sources is 91%, only 52% of the region’s population uses piped water into the household (see Annex 2). However, even when access to drinking-water is provided through piped systems, these statistics do not provide certainty about water safety, continuity of services, affordability and the quantity of water delivered.

Even without including Papua New Guinea in the analysis, sanitation coverage in the region is less than encouraging: almost half of the rural population does not use an improved sanitation facility.

Figure 3

Proportion of urban, rural and total population in the Pacific region using improved sanitation, 1990 and 2015 (not including Papua New Guinea)

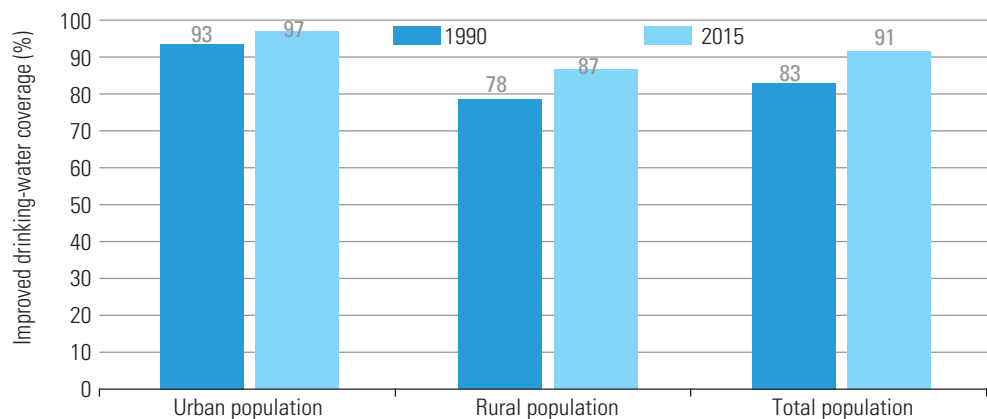


Source: country coverage data from UNICEF and WHO (2015)

Not including Papua New Guinea, regional coverage with improved drinking-water sources in 2015 is the same as the global coverage estimate (91%).

Figure 4

Proportion of urban, rural and total population in the Pacific region using improved drinking-water sources, 1990 and 2015 (not including Papua New Guinea)



Source: country coverage data from UNICEF and WHO (2015)

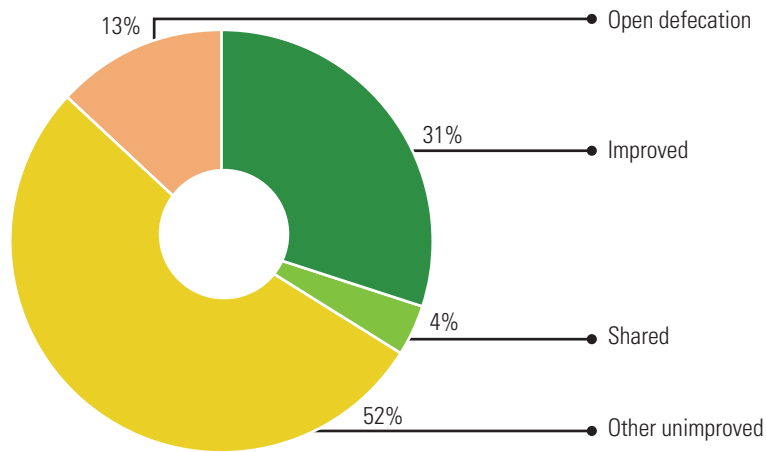
Figures 5 and 6 show the proportion of people using different types of sanitation and drinking-water facilities. They also provide information on the proportion of people using unprotected surface drinking-water or practising open defecation.

The Pacific region has one of the lowest levels of sanitation coverage worldwide. However, open defecation in the region (13%) is lower than Southern Asia (34%), sub-Saharan Africa (23%), and equals the world average (13%). The proportion of people using improved drinking-water facilities is 52%, which is lower than sub-Saharan Africa (68%) and the world (91%) (WHO, UNICEF, 2015).

With sanitation coverage of 31% and drinking-water coverage of 52%, the Pacific region lags behind the world in terms of access to these basic services.

Figure 5

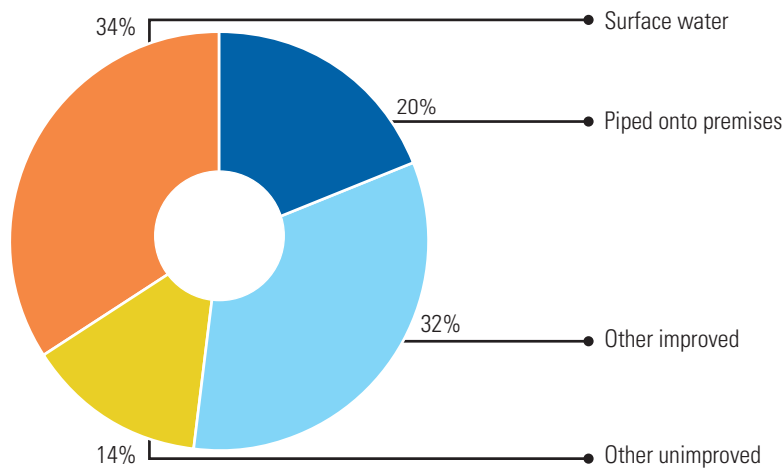
Proportion of people using different types of sanitation facilities or practising open defecation, Pacific region, 2015



Source: country coverage data from UNICEF and WHO (2015)

Figure 6

Proportion of people using different types of drinking-water supplies or using surface water, Pacific region, 2015



Source: country coverage data from UNICEF and WHO (2015)

* Improved drinking-water-supply coverage means the sum of 'other improved' plus 'piped onto premises'.

SECTION 2

Sanitation coverage in Pacific island countries

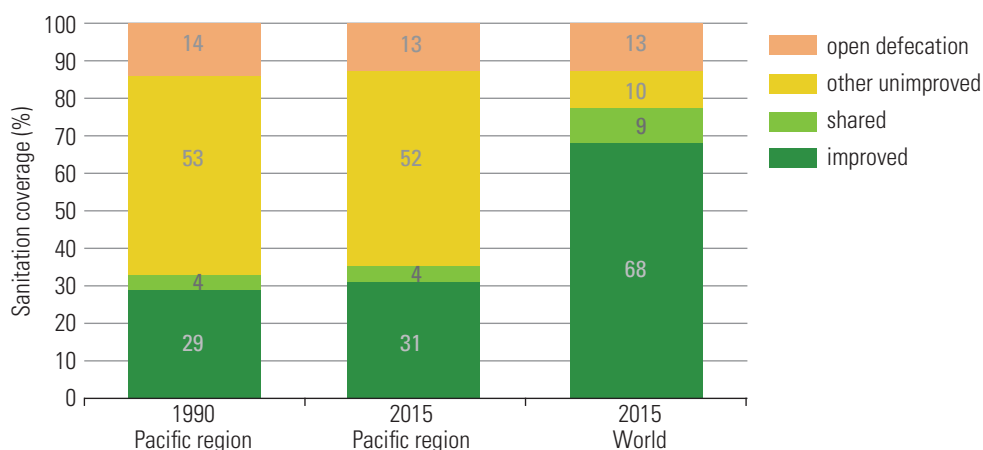
2.1 Status of sanitation in Pacific island countries

Limited progress has been made towards increasing access to improved sanitation in the Pacific region since 1990 (Fig. 7). About 70% of the population still use unimproved sanitation facilities and 13% practise open defecation. The sanitation coverage in the Pacific region is less than half the world coverage.

The Pacific region has increased improved sanitation coverage by only 2% from 1990 to 2015. Open defecation has decreased by only 1%.

Figure 7

Proportion of the population in the Pacific region using an improved, shared or other unimproved sanitation facility or practising open defecation in 1990 and 2015, and comparison with the world aggregated statistics



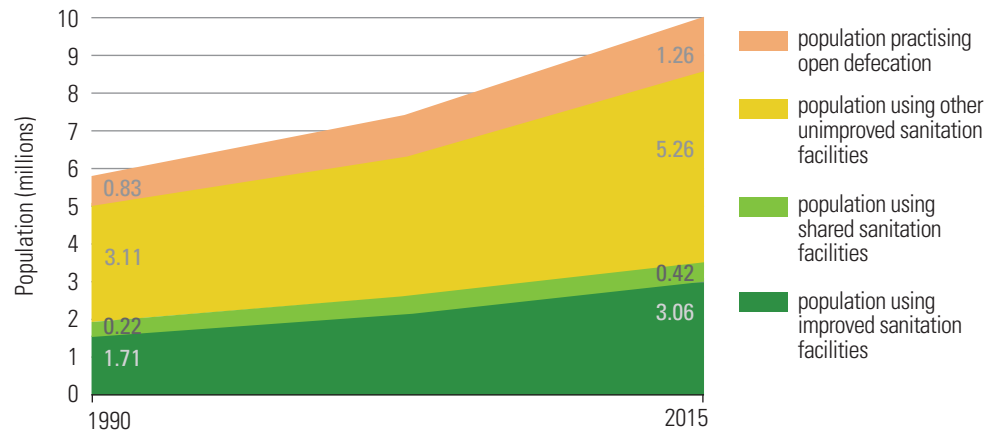
Source: country statistics from UNICEF and WHO (2015)

Though more than 1.3 million people in the Pacific region gained access to improved sanitation from 1990 to 2015, this was insufficient to keep pace even with population growth. Around 7 million people still do not have access to improved sanitation and nearly 1.3 million practise open defecation (Fig. 8). From 1990 to 2015, the number of people not using improved sanitation facilities increased by 2.8 million.

The number of people using improved sanitation facilities increased by 79% from 1990 to 2015. However, the population using unimproved facilities or practising open defecation increased by 67%. Nearly 1.3 million people still practise open defecation in the region.

Figure 8

Population in the Pacific region using improved, shared or other unimproved sanitation facilities or practising open defecation, 1990–2015



Source: country statistics from UNICEF and WHO (2015)

High population growth and the low priority given to sanitation and drinking-water investments are two explanations for the lack of progress. Urban areas have grown by 61% and rural areas by 73% from 1990 to 2015, so simply keeping pace with population growth would have been a challenge (UN, 2014). Despite recent investments in sanitation and drinking-water (since the mid-2000s), competing investments received greater priority at earlier stages.

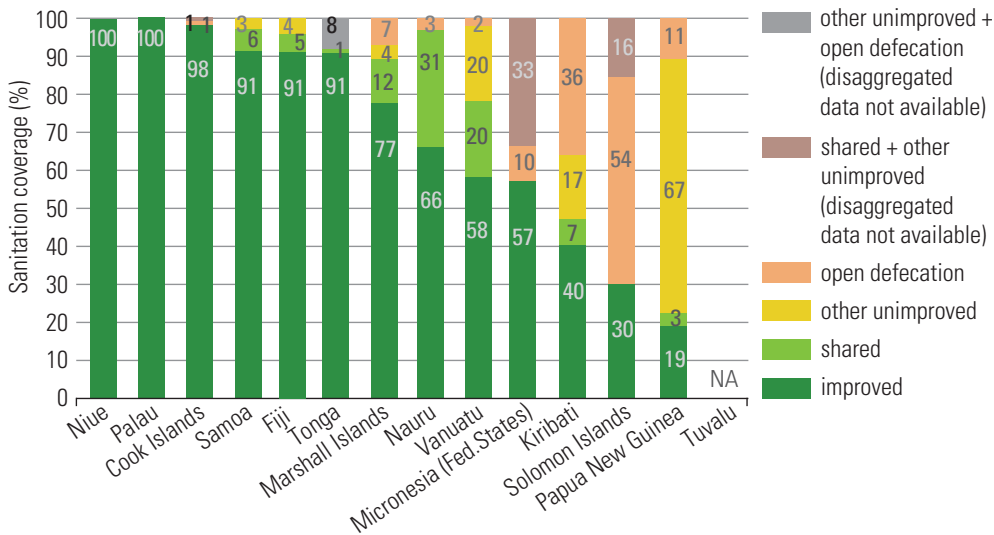
Access to improved sanitation is uneven in the Pacific region. Melanesian countries face the lowest rates of access. The 31% regional rate of access to improved sanitation masks a huge coverage variation between countries (Fig. 9). An individual analysis of the statistics of each country shows that most countries have improved sanitation coverage higher than the world average of 68% with the exception of Papua New Guinea (19%), Solomon Islands (30%), Kiribati (40%), the Federated States of Micronesia (57%), Vanuatu (58%) and Nauru (66%).

Most of the unserved are in Papua New Guinea, both because it represents three-quarters of the region's population and because it has a low coverage level of 19%. Without including Papua New Guinea in the analysis, three countries, Fiji, Solomon Islands and Vanuatu host 81% of the population without access to improved sanitation. Figure 10 indicates the distribution of the unserved throughout the region not including Papua New Guinea. Box 1 describes the experience of Kiribati in dealing with open defecation.

Open defecation is significant in Kiribati, the Federated States of Micronesia, Papua New Guinea and Solomon Islands.

Figure 9

Proportion of Pacific island countries population using an improved, shared or other unimproved sanitation facility or practising open defecation, 2015

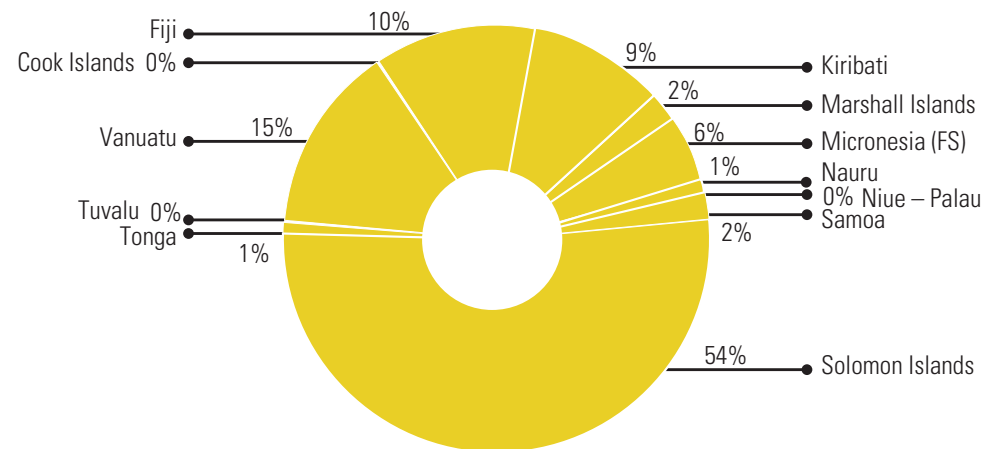


Source: country statistics from UNICEF and WHO (2015)

When Papua New Guinea is not included in the analysis, Solomon Islands hosts more than half of Pacific island population without access to improved sanitation facilities.

Figure 10

Pacific populations using unimproved sanitation facilities, not including Papua New Guinea, 2015



Source: coverage figures from UNICEF, WHO (2015)

BOX 1. Success eliminating open defecation in Kiribati

Kiribati has one of the highest rates of under-5 mortality in the Pacific region, at 47 deaths per 1000 live births. This is mainly due to diarrhoeal disease, caused by inadequate access to safe drinking-water and sanitation. In the outer islands, nearly 50% of the rural population – and on some islands more than 70% of the population – practise open defecation. In densely-populated South Tarawa, very shallow water lenses are highly vulnerable to contamination. The lack of sanitation in Kiribati has been described as being at “crisis levels” in terms of the risk it poses to public health and scarce water resources.

The Ministry of Public Works and Utilities (MPWU) together with Ministry of Health and Medical Services, Island Councils, UNICEF, and other national WASH sector partners piloted a radically different approach to mobilizing communities to stop open defecation, without offering up-front hardware subsidies. Trained facilitators used tools from community-led total sanitation (CLTS) to support communities in North Tarawa to map their sanitation and drinking-water facilities and develop plans for eliminating open defecation.

The success in North Tarawa led MPWU and UNICEF to a roll out to the Gilbert Islands, using funding from the European Union and the Government of Kiribati. One year later, more than 70 communities on six outer islands had declared themselves free of open defecation. These declarations require continuous community commitment, monitoring and verification. The President of Kiribati and Cabinet have committed to achieving an “Open Defecation Free Kiribati” by 2015, using CLTS to increase sanitation coverage in line with the National Sanitation Policy.

Once open defecation is eliminated using the CLTS approach, households will have to upgrade shallow pit latrines and composting toilets with guidance on location so that drinking-water quality is not compromised. This will require long-term commitment and community ownership that enables households to afford safe technologies.

Participatory mapping during community mobilization can be an entry point for identifying and discussing health risks from open defecation, poorly built latrines, pigs and household waste. Most communities are familiar with managing these risks, for example by drinking only rainwater or boiling well water prior to drinking. Additional support to develop a comprehensive risk management framework should follow once Kiribati is free of open defecation.

Sources: Ministry of Health and Medical Services working documents; JMP 2014; Kiribati National Census, 2010; Monitoring Reports: Water and Sanitation in Kiribati Outer Islands – Phase I, Delegation of the European Union for the Pacific.

2.2 Sanitation inequities

2.2.1 Urban-rural divide

The disparity between urban and rural sanitation coverage is significant. While 71% of urban residents enjoy access to improved sanitation, only 21% of rural residents have access (Fig. 11 and 12).

There is a huge disparity between urban and rural sanitation coverages in the Pacific region. While about two in three urban citizens use improved sanitation, only one in five rural citizens use improved sanitation.

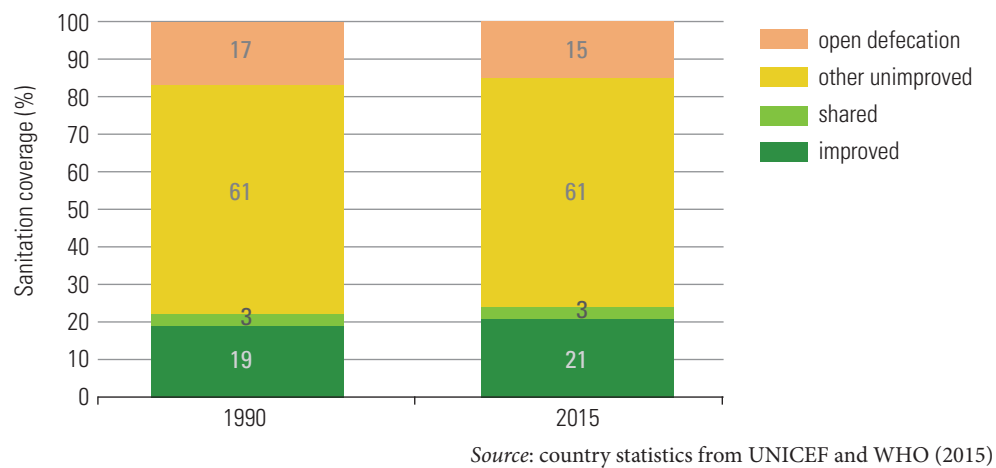
Figure 11

Proportion of population in urban areas of the Pacific region using an improved, shared or other unimproved sanitation facility or practising open defecation, 1990 and 2015



Figure 12

Proportion of population in rural areas of the Pacific region using an improved, shared or other unimproved sanitation facility or practising open defecation, 1990 and 2015



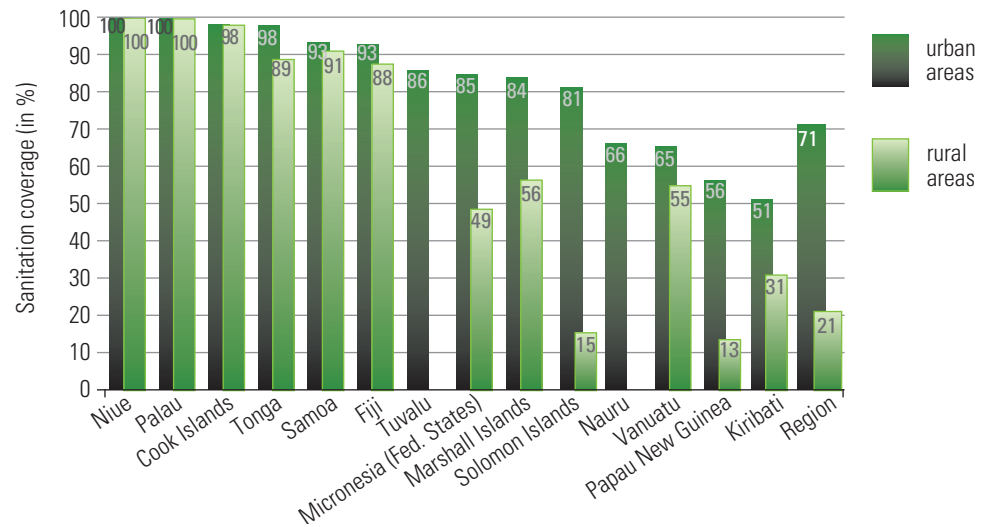
In several countries, there is a huge disparity between urban and rural areas, including Kiribati, the Federated States of Micronesia, Papua New Guinea and Solomon Islands (Fig. 13).

Rural areas have been neglected in terms of sanitation investments. While the absolute numbers of people unserved had a relatively small increase in urban areas from 1990 to 2015, the rural unserved increased by nearly 70% (Fig. 14).

The urban sanitation coverage in Solomon Islands is more than five times greater than in rural areas.

Figure 13

Proportion of population using improved sanitation in Pacific island countries, urban and rural areas, 2015

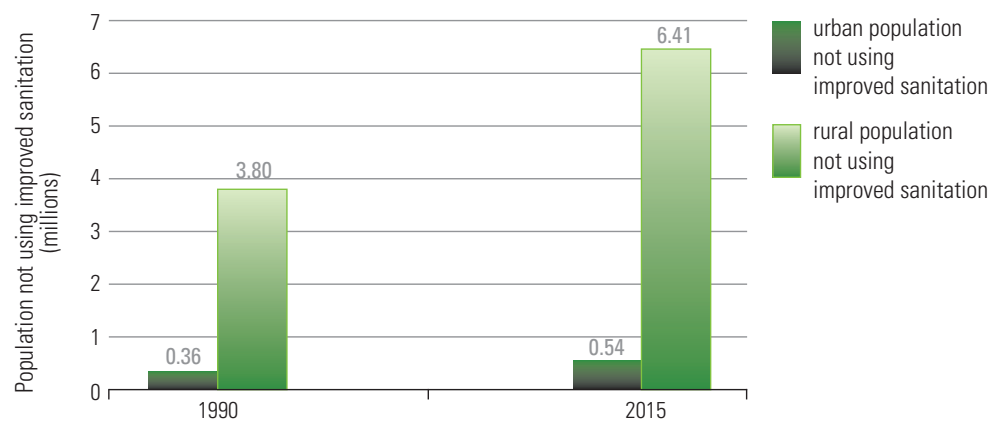


Source: country statistics from UNICEF and WHO (2015)

While the urban population not using improved sanitation in urban areas increased by 180 000 people, the unserved in rural areas increased by 2 610 000 in the past 25 years.

Figure 14

Pacific population not using improved sanitation, urban, rural, 1990 and 2015



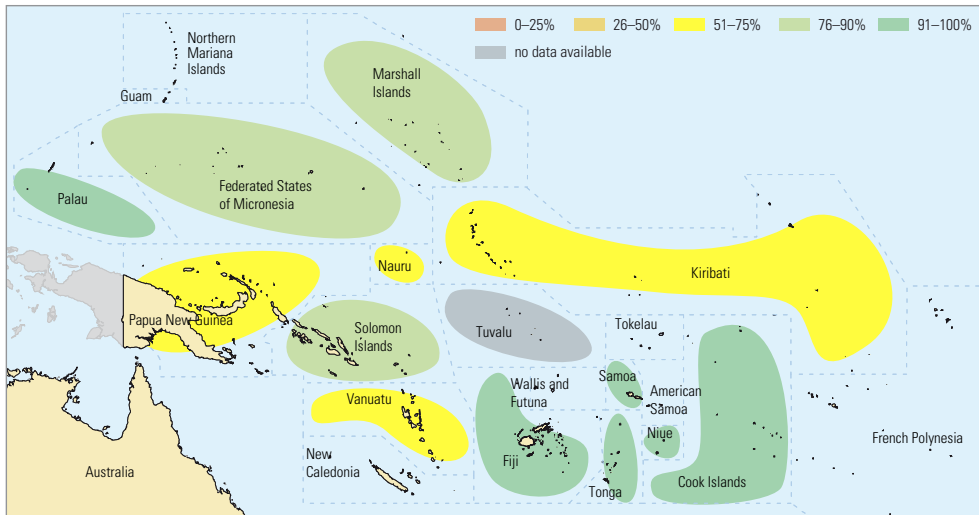
Source: country statistics from UNICEF and WHO (2015)

Maps 3 and 4 display the status of urban and rural improved sanitation coverage in Pacific island countries. The urban coverage in all countries is greater than 50%.

Ten countries in the Pacific region have urban sanitation coverage greater than 75%, but only six countries have rural coverage greater than 75%.

Map 3

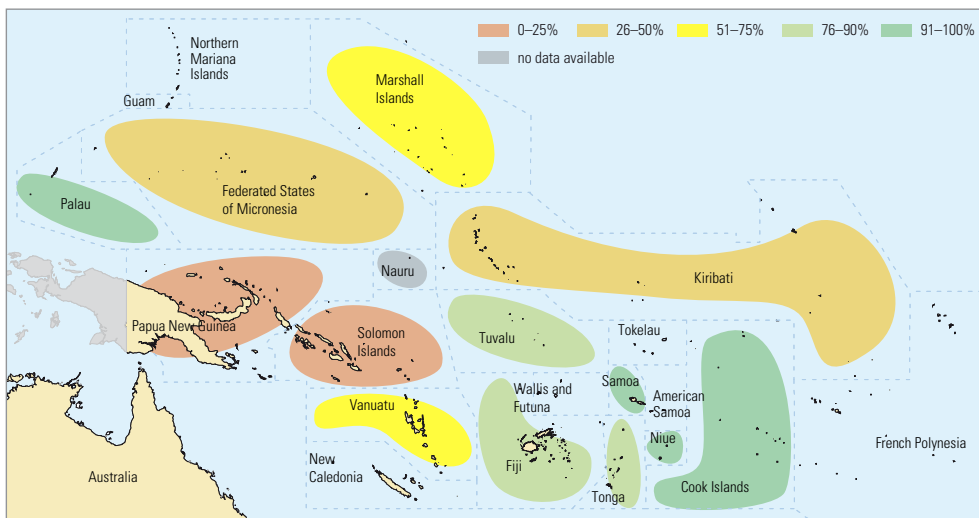
Improved sanitation coverage in urban areas of the Pacific region, 2015



Source: country coverage from UNICEF and WHO (2015)

Map 4

Improved sanitation coverage in selected rural areas of the Pacific region, 2015



Source: country coverage from UNICEF and WHO (2015)

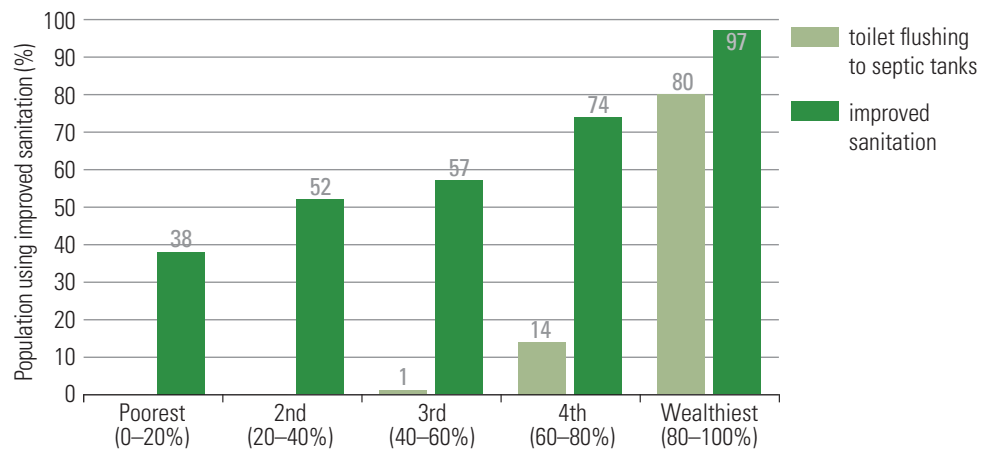
2.2.2 Economic inequities

Household level data indicate large economic inequities in sanitation coverage, with higher-income households having access to better sanitation facilities. This reflects similar situations globally. Unfortunately, the available data do not allow for an analysis for the Pacific region, but the example of Vanuatu (Fig. 15) shows the proportion of people using improved sanitation per wealth quintile.

With national improved sanitation coverage of 58%, the inequality is huge from 97% coverage in the wealthiest quintile to 38% coverage in the poorest quintile. Among the wealthiest population group, about 80% use toilets flushing to septic tanks compared to 0% for the lowest quintiles.

Figure 15

Population of Vanuatu using improved sanitation by wealth quintile, 2007



Source: Vanuatu DGMWR (2008)

Note: The sanitation statistics presented in Figure 15 refer to one single household survey conducted in 2007, whereas the JMP statistics are based on all the surveys conducted in the country. Thus the statistics presented in these figures may differ from those presented by the JMP.

SECTION 3

Drinking-water coverage in Pacific island countries

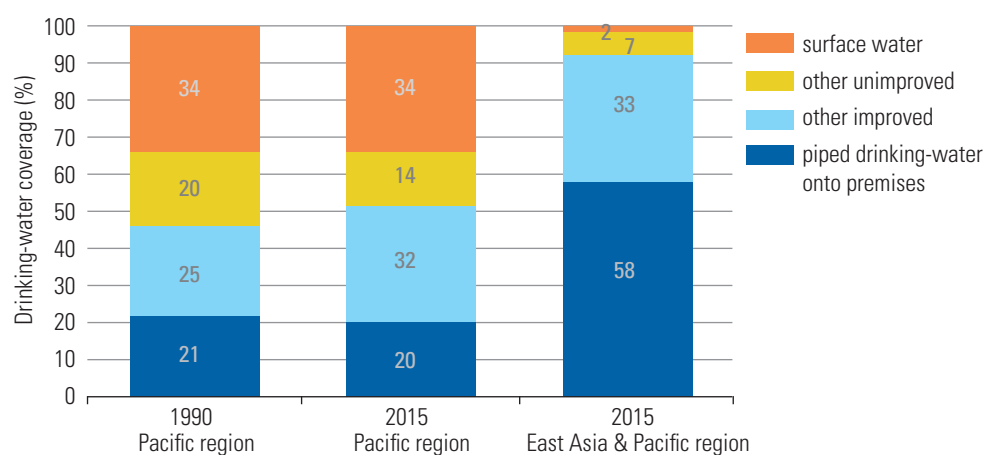
3.1 Current status

People living in the Pacific region have lower access to improved drinking-water than anywhere else in the world. Improved drinking-water* coverage in the Pacific region has increased by only 6% since 1990. At just 20%, piped water coverage in the Pacific region is the lowest in the world. Coverage has increased only for other improved drinking-water sources; the proportion of people with piped water on their premises has actually decreased. In the region, 34% of the population relies on water taken directly from rivers, ponds and lakes. This has not improved in more than two decades (Fig. 16). The situation of the Pacific region now is similar to that of sub-Saharan Africa in 1990. Today, Sub-Saharan Africa's regional coverage of improved drinking-water is 10% higher than the Pacific region.

The Pacific region experienced a reduction in the proportion of people using piped water onto the household from 1990 to 2015. Overall, the total proportion of people served with an improved drinking-water increased by mere 13%.

Figure 16

Proportion of population using different types of drinking-water sources, 1990 and 2015



Source: country statistics from UNICEF and WHO (2015)

* Improved drinking-water coverage is the sum of piped drinking-water on premises and other improved (see Table 1).

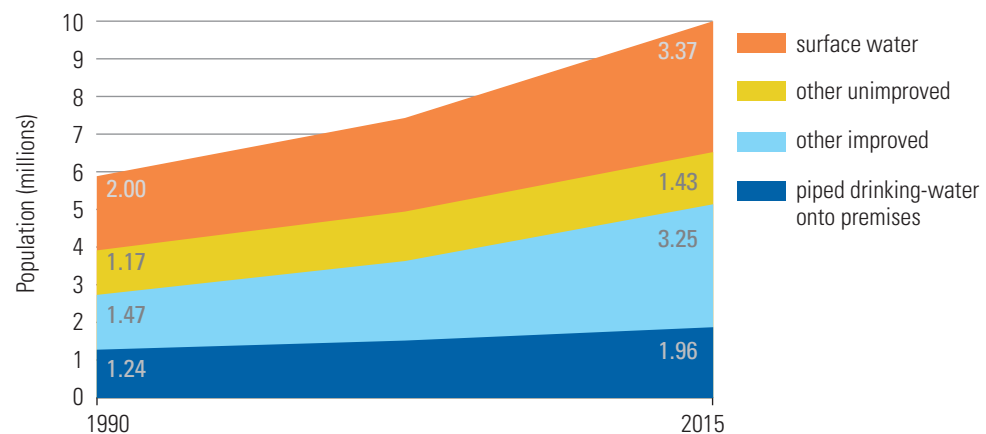
These statistics show that improved drinking-water coverage is not keeping pace with population growth. From 1990 to 2015, about 720 000 people gained access to piped water onto the household, while 1.8 million gained access to other types of improved drinking-water facilities (Fig. 17). This good news is overshadowed by the fact that from 1990 to 2015 more than 1.4 million people were added to the 2.0 million people using surface water.

The population using improved drinking-water sources increased from 2.7 million in 1990 to 5.2 million in 2015. However the numbers of unserved also increased from 3.2 million in 1990 to 4.8 million in 2015. This means that the efforts in the region were insufficient to keep pace with the population growth of 4.1 million.

While 2.5 million people in the region gained access to improved drinking-water from 1990 to 2015, the population using drinking-water from unimproved sources and surface water (rivers, lakes and ponds) increased by about 1.6 million.

Figure 17

Population in the Pacific region, using improved, shared or other unimproved drinking-water sources, 1990 and 2015



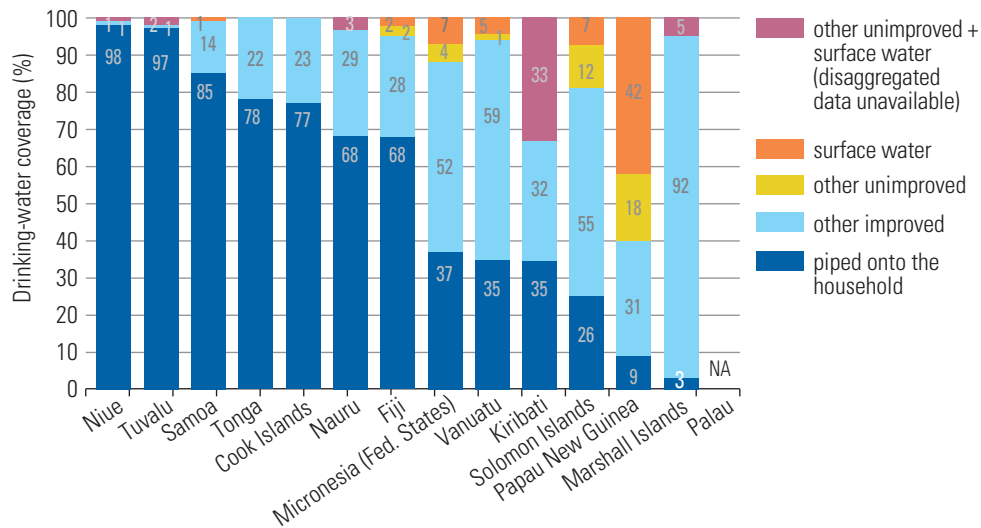
Source: country statistics from UNICEF and WHO (2015)

The types of drinking-water sources used by people in the Pacific region vary widely between countries. Regional statistics hide the impressive performance of many countries. For example, coverage in nine countries is higher than 90% (Fig. 18). The use of surface water such as rivers, lakes and ponds as the primary source of drinking-water brings about huge health risks to people with this type of access, especially children (Prüss-Üstün et al., 2008). Only a small quantity of water can be hauled daily, and serious microbial, parasites and chemical hazards are typical of this type of source.

Drinking-water sources used by people in Pacific region vary widely between countries.

Figure 18

Proportion of the Pacific population using different types of drinking-water sources, 2015



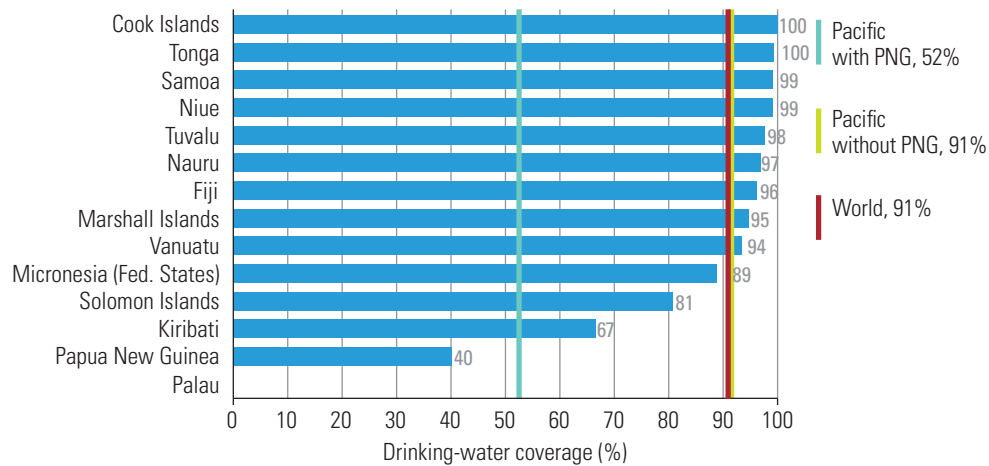
Source: country statistics from UNICEF and WHO (2015)

While improved drinking-water coverage is above 90% in nine Pacific island countries, a few countries have much lower coverage (Fig. 19). If Papua New Guinea was not included in the regional coverage analysis, the remaining regional coverage would be the same as the global average.

Two countries, Papua New Guinea and Kiribati, show a high disparity in improved drinking-water coverage as compared to other countries in the Pacific region.

Figure 19

Proportion of population using improved drinking-water in Pacific island countries and averages for region – with and without Papua New Guinea – and the world, 2015



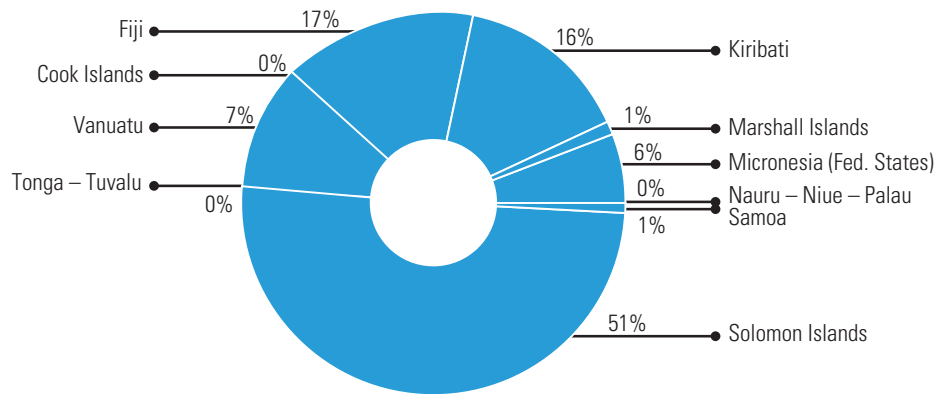
Source: country statistics from UNICEF and WHO (2015)

If Papua New Guinea is not included in the regional coverage analysis, regional coverage levels to the global average. Solomon Islands hosts 51% of the regional population (not including Papua New Guinea) without access to improved drinking-water (Fig. 20).

Ten countries in the region, have less than 10% of the population without access to improved drinking-water facilities (without considering Papua New Guinea).

Figure 20

Distribution of the population in Pacific island countries not using improved drinking-water supplies, not including Papua New Guinea, 2015



Source: coverage figures from UNICEF and WHO (2015)

3.2 Water inequities

3.2.1 Urban-rural divide

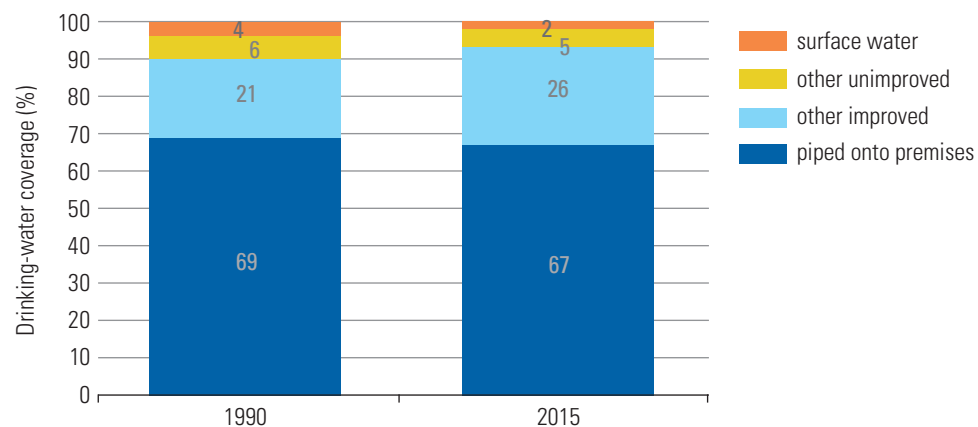
People living in urban areas of Pacific island countries are, on average, almost eight times more likely to have water piped into their household than their rural counterparts. While 67% of urban citizens enjoy piped water into the household, only 9% of rural citizens uses this type of source (Fig. 21 and 22). Access to all improved drinking-water sources in urban areas is more than double that of rural areas.

Kiribati and Papua New Guinea have the highest disparities in the region between urban and rural improved drinking-water coverage. These disparities also impact the regional average (Fig. 23). Eight out of 13 countries have less disparity between urban and rural areas, with a gap below 10 percentage points.

In the Pacific region, 41% of the rural population still use drinking-water directly from rivers, lakes, streams and canals. In urban areas, only 2% of the population use these types of sources.

Figure 21

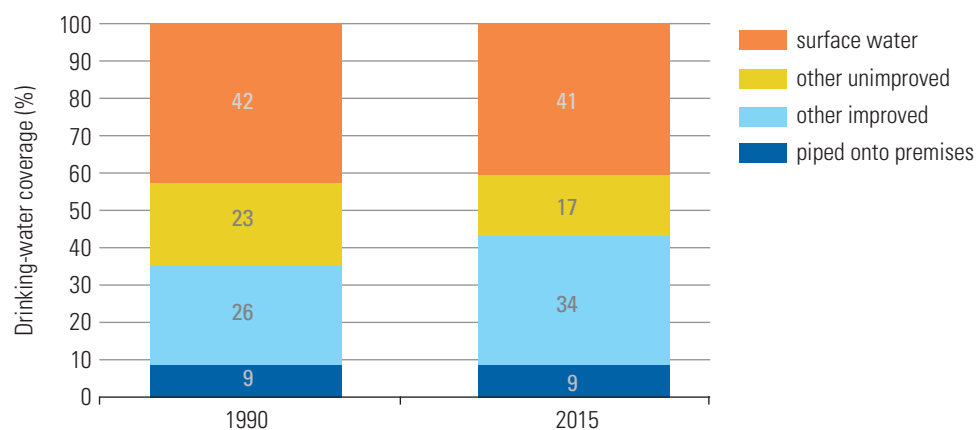
Proportion of population in urban areas of the Pacific region using different sources of improved drinking-water, 1990 and 2015



Source: country statistics from UNICEF and WHO (2015)

Figure 22

Proportion of population in rural areas of the Pacific region using different sources of improved drinking-water, 1990 and 2015

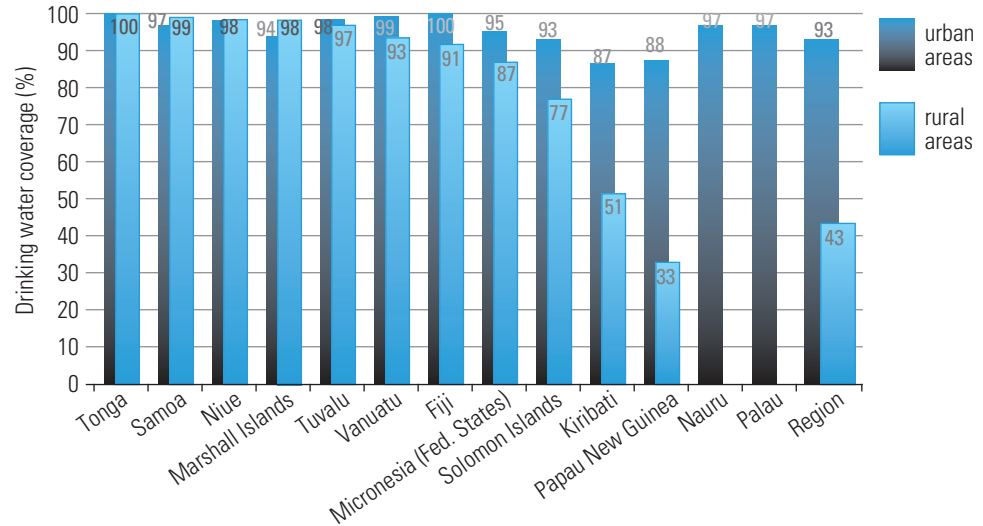


Source: country statistics from UNICEF and WHO (2015)

Urban drinking-water coverage in the Pacific region is more than double rural coverage.

Figure 23

Proportion of population using improved drinking-water sources in Pacific island countries, urban and rural areas, 2015



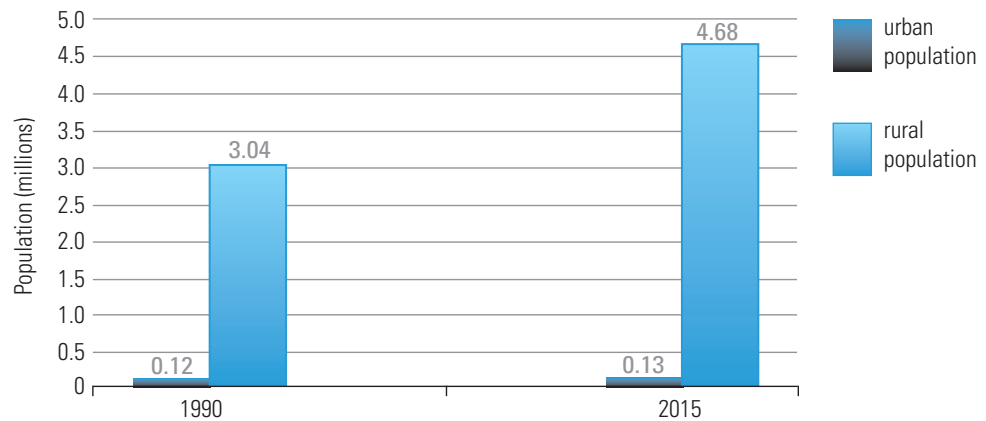
Source: country statistics from UNICEF and WHO (2015)

Most people using unimproved drinking-water in the Pacific region live in rural areas (Fig. 24). The urban population using unimproved drinking-water has not changed significantly in 25 years, while the rural population using unimproved drinking-water has increased by more than 50% during the same period of time.

The rural population not using improved drinking-water is 36 times the urban population without this service.

Figure 24

Pacific population not using improved drinking-water, urban and rural, 1990 and 2015



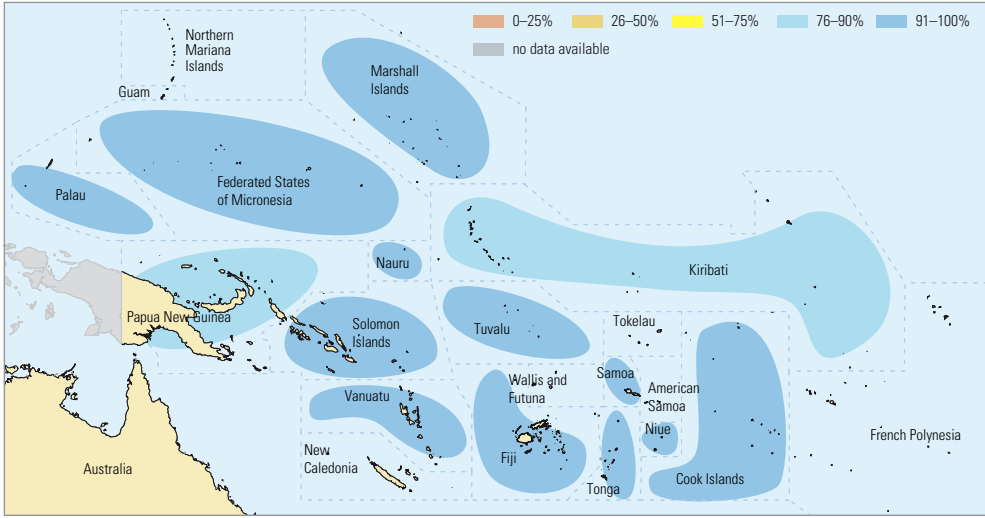
Source: country statistics from UNICEF and WHO (2015)

Maps 5 and 6 present the status of urban and rural improved drinking-water coverage in Pacific island countries. Urban coverage in all countries is high. Coverage is less than 91% in only two countries. In rural areas, coverage in half of the countries is less than 91%.

Improved drinking-water coverage is greater than 90% in most urban areas of Pacific island countries. In rural areas, improved coverage is higher than 90% in half of the countries.

Map 5

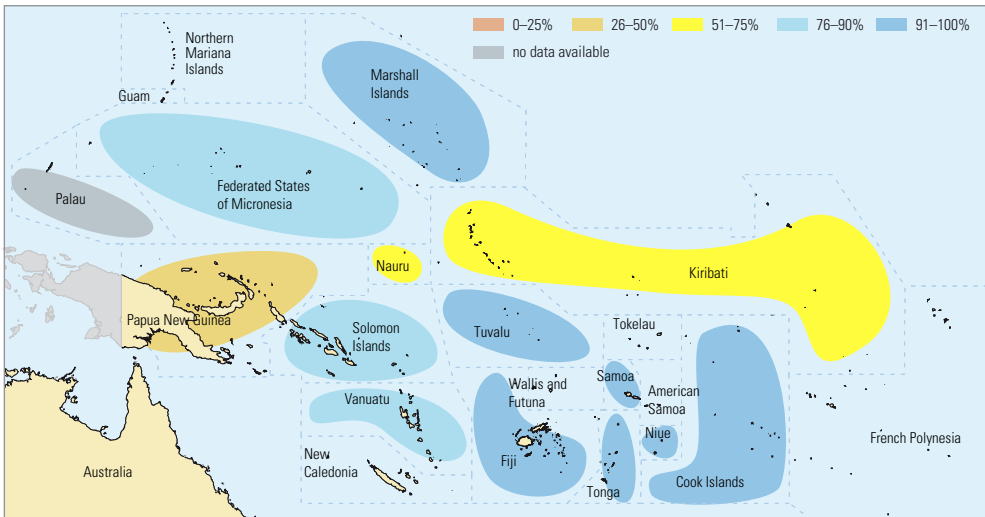
Improved drinking-water coverage in urban areas of the Pacific region, 2015



Source: country statistics from UNICEF and WHO (2015)

Map 6

Improved drinking-water coverage in selected rural areas of the Pacific region, 2015



Source: country statistics from UNICEF and WHO (2015)

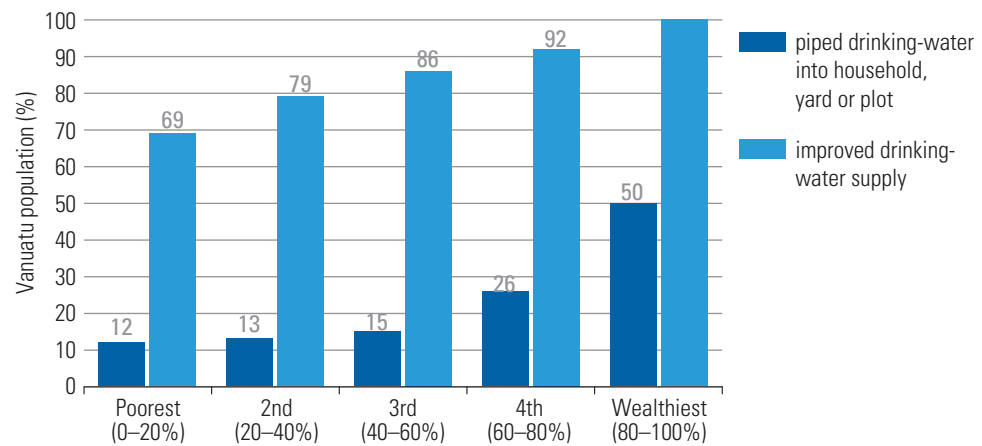
3.2.2 Drinking-water coverage according to wealth quintiles

Household surveys conducted in Pacific island countries lacked sufficient information to provide a regional perspective of improved drinking-water coverage according to wealth quintiles. The Multiple Indicator Cluster Survey conducted in Vanuatu in 2007 supports this type of analysis for drinking-water (Fig. 25). The analysis included access to piped water into households to highlight the disparity between those in the higher social categories and those with low socioeconomic status.

While in the wealthiest quintile, improved drinking-water coverage reaches 100%, in the poorest quintile 69% of the population can access an improved drinking-water source. In the wealthiest quintile, drinking-water for 50% of the population is piped onto the household, compared to only 12% of the population in the poorest quintile.

Figure 25

Vanuatu population using improved drinking-water and piped drinking-water into the household by wealth quintile, 2007



Source: Vanuatu DGMWR (2008)

Note: The drinking-water statistics presented in Figure 25 refer to one single household survey conducted in 2007, whereas the JMP statistics consider all the surveys conducted in the country. Thus the statistics presented in these figures may differ from those presented by the JMP.

SECTION 4

The MDG targets and beyond

In September 2000, building on a decade of major United Nations conferences and summits, world leaders adopted the United Nations Millennium Declaration, committing their nations to a new global partnership to reduce extreme poverty and setting out time-bound goals and targets to be achieved by 2015. These became known as the Millennium Development Goals (MDGs) (UN, 2014). MDG target 7.C is to “halve, by 2015, the proportion of people without sustainable access to safe drinking-water and basic sanitation”. This section provides an assessment of MDG target achievements in Pacific island countries.

4.1 Achieving the MDG sanitation targets

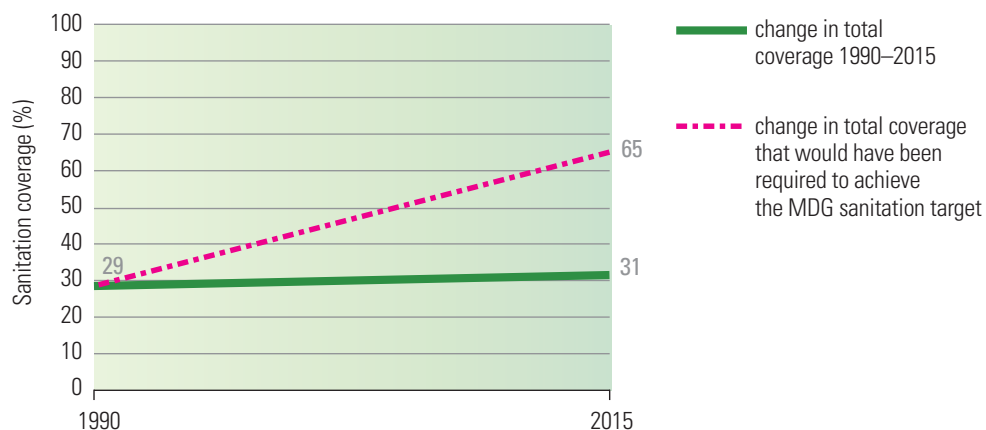
4.1.1 Sanitation coverage statistics at the MDG target year

The Pacific region has not achieved the MDG sanitation target of 65%, achieving only 31% at the 2015 deadline (Fig. 26). Even with the exclusion of Papua New Guinea from regional statistics, the region would not achieve the target (Fig. 27).

The MDG sanitation target has not been met and about 7 out of every 10 people in the region still have no access to improved sanitation in 2015.

Figure 26

Change in the proportion of people using improved sanitation from 1990 and 2015, and MDG sanitation target in the Pacific region

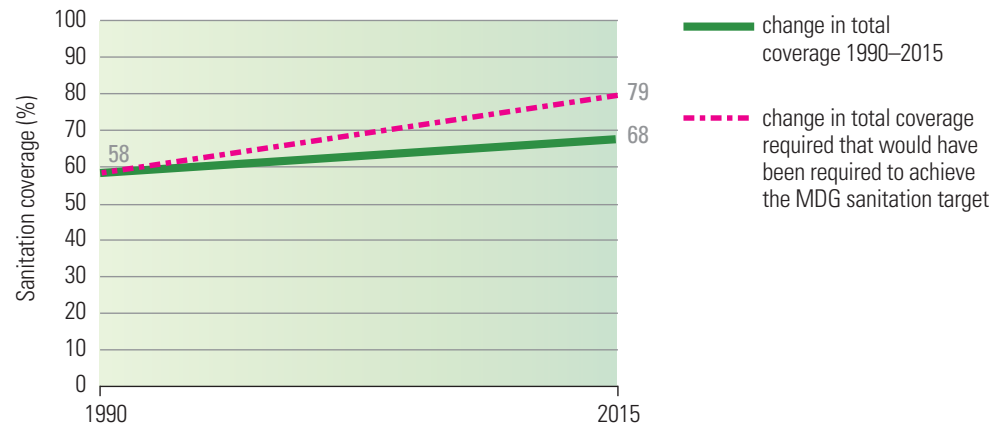


Source: country statistics from UNICEF and WHO (2015)

Even not including Papua New Guinea in the regional analysis, the region would not have achieved the MDG sanitation target.

Figure 27

Change in the proportion of people using improved sanitation from 1990 and 2015, and MDG sanitation target in the Pacific region, not including Papua New Guinea



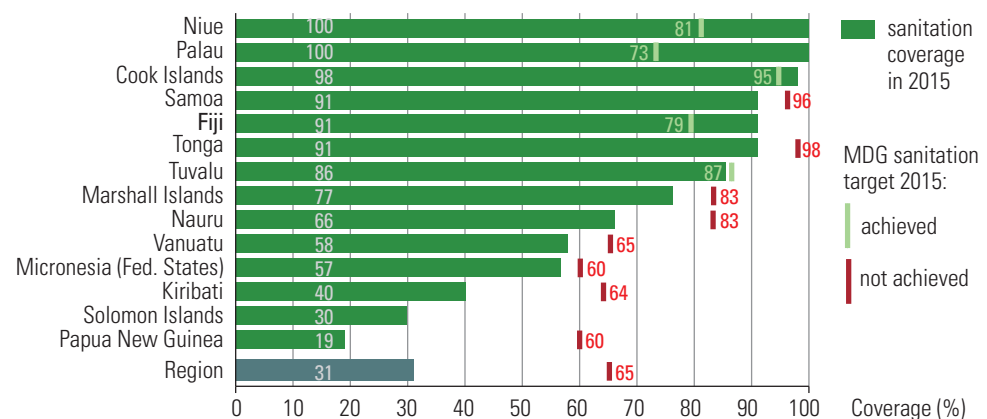
Source: country statistics from UNICEF and WHO (2015)

Individually, only five Pacific island countries achieved the MDG sanitation target. More performed well but even then did not reach the target (Fig. 28). For example, Samoa and Tonga achieved coverage of improved sanitation facilities above 90% in 2015 but did not achieve the MDG target. As their coverage statistics were high in 1990, the target of halving the proportion of unserved by 2015 was more difficult to achieve. The unserved were possibly in remote, hard-to-reach areas.

Less than half of the Pacific island countries have achieved the MDG sanitation target.

Figure 28

Proportion of people using improved sanitation in 2015 and respective country MDG sanitation target in Pacific island countries



Source: country statistics from UNICEF and WHO (2015)

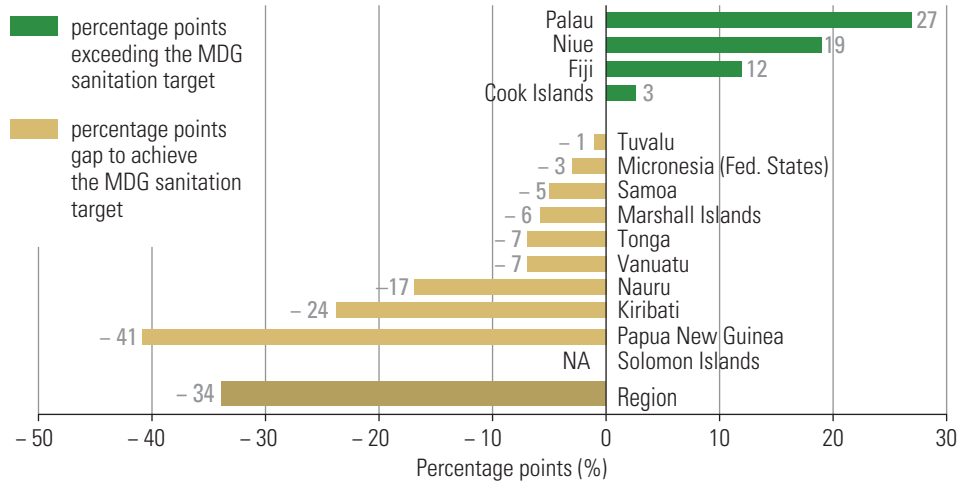
Notes:

1. The JMP has not provided 1990 improved sanitation coverage statistics for Cook Islands, Niue and Vanuatu. The MDG target was estimated for these countries based on 1995 and 2015 data. Similarly, the JMP has not provided 2015 sanitation coverage statistics for Tuvalu. The 2015 sanitation coverage was extrapolated from 1990 and 2010 coverage figures.
2. This report, consistently with the JMP, considers that the MDG target is achieved if the difference between the coverage in 2015 and the MDG target is equal to or greater than -1%.
3. The MDG sanitation target is not available for Solomon Islands.

A country-by-country analysis of coverage performance against the MDG targets shows that Kiribati and Papua New Guinea have the biggest gaps. Cook Islands, Fiji, Niue, Palau and Tuvalu are considered to have achieved the MDG sanitation target (Fig. 29).

Countries having achieved the MDG sanitation target are Cook Islands, Fiji, Niue, Palau and Tuvalu.

Figure 29
Difference between sanitation coverage in 2015 and the MDG sanitation target in Pacific island countries



Source: country statistics from UNICEF and WHO (2015)

Statistics referring to the use of improved sanitation facilities do not indicate infrastructure quality. The term improved sanitation refers to certain types of facilities that are more likely than others to be sanitary (see definition of improved sanitation in section 4.3.1). The JMP uses a variety of household surveys to estimate coverage, including Demographic and Health Surveys (DHS), Multiple Indicator Cluster Surveys (MICS), the World Health Surveys (WHS), and national surveys and censuses. These instruments do not include an assessment of cleanliness, affordability, sustainability and whether the sanitation facility effectively protects human and environmental health.

The fragile ecological balance and water resources vulnerability in most Pacific island countries requires rethinking of what is safe and adequate. On atoll islands, for instance, some “improved” sanitation technologies may be hazardous to sources of drinking-water and the environment. Poorly-maintained water-borne sanitation systems such as septic tanks can deteriorate groundwater quality. Public sewerage systems discharging untreated sewage into water bodies can cause serious harm to the fragile reef ecosystems. The discharge of raw sewage into coastal areas may also affect the food chain through fish and shellfish.

4.1.2 Regional analysis of sanitation coverage at the MDG target year

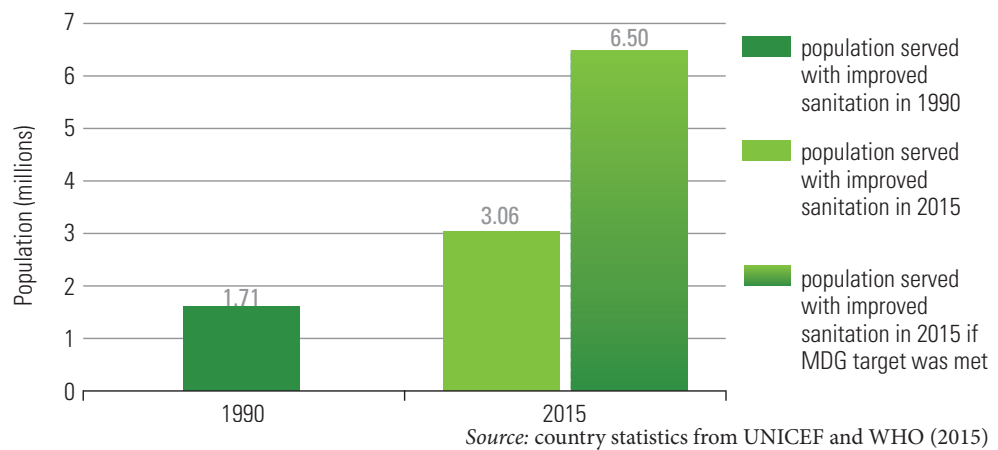
In the Pacific region, the total population using improved sanitation facilities in 2015 is 79% higher than that of 1990. This is far less than the 280% increase required to achieve the target. Achieving the sanitation target would have required an additional 3.4 million people gaining access to improved sanitation in addition to the numbers of people served in 2015 (Fig. 30).

Figure 31 makes a similar analysis taking into account the population not using improved sanitation facilities. The numbers of people not using improved sanitation in 2015 is 67% higher than that of 1990 – achieving the MDG sanitation target would have required that the numbers of people unserved in 2015 was half the actual 2015 value.

Achieving the region’s MDG sanitation target, would have required improved sanitation for an additional 3.4 million people on top of the population currently served.

Figure 30

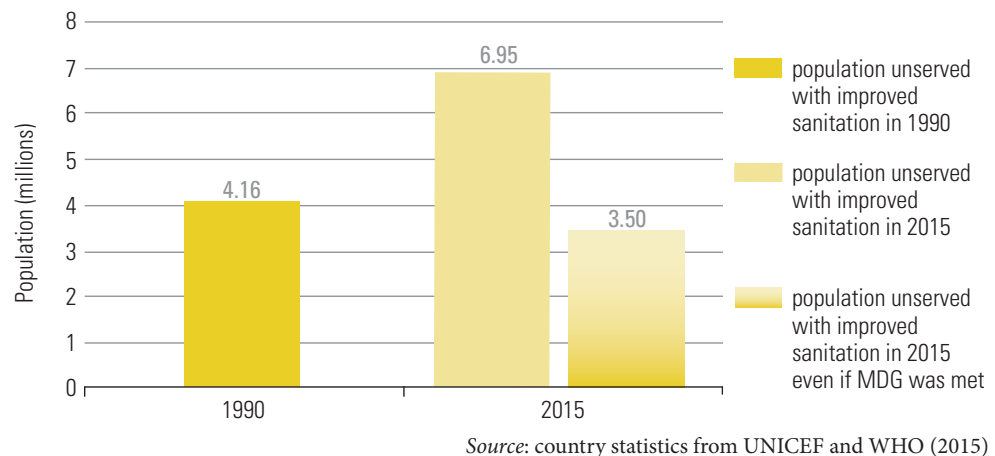
Change in numbers of people served with improved sanitation from 1990 to 2015 and MDG sanitation target in the Pacific region



Achieving the MDG sanitation target would require that the population not using improved sanitation in 2015 should be nearly half the actual numbers of unserved.

Figure 31

Change in numbers of people unserved with improved sanitation from 1990 to 2015, and MDG sanitation target in the Pacific region



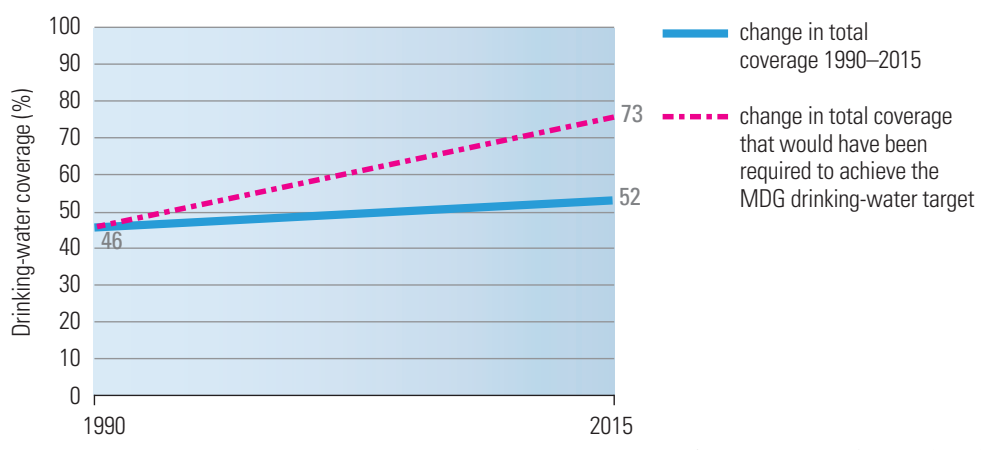
4.2 Achieving the MDG drinking-water targets

4.2.1 Drinking-water coverage statistics at the MDG target year

The Pacific region has not achieved the MDG drinking-water target. The coverage of 52% is 21 percentage points less than the target of 73% (Fig. 32). Even if the target was achieved, about one quarter of the population in the region would still not use an improved source of drinking-water in 2015. Not including Papua New Guinea in the regional analysis changes this considerably. Without Papua New Guinea, the region would miss the MDG drinking-water target by only one percentage point (Fig. 33). Regional statistics obscure the good progress made in 10 of 14 Pacific island countries due to the large unserved population in Melanesia.

The MDG drinking-water target has not been met and almost half the region’s population still does not use improved drinking-water sources in 2015.

Figure 32
Change in the proportion of people using improved drinking-water sources from 1990 to 2015 and MDG drinking-water target in the Pacific region



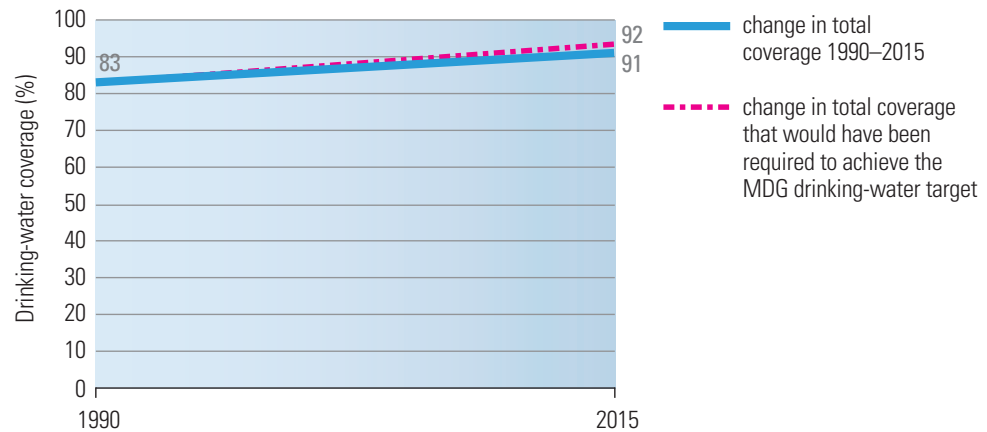
Source: country statistics from UNICEF and WHO (2015)

Most countries achieved their respective MDG drinking-water target. Out of the 14 Pacific island countries, only Kiribati, the Federated States of Micronesia and Papua New Guinea did not achieve the target. The highest-performing country is Vanuatu, while Papua New Guinea’s gap of 27 percentage points shows the least amount of progress (Fig. 34 and 35).

Not including Papua New Guinea, the region would have achieved the MDG drinking-water target. In this case, about 9 out of 10 people would be using an improved drinking-water source in 2015.

Figure 33

Change in the proportion of people using improved drinking-water sources from 1990 to 2015 and MDG drinking-water target in the Pacific region (without Papua New Guinea)

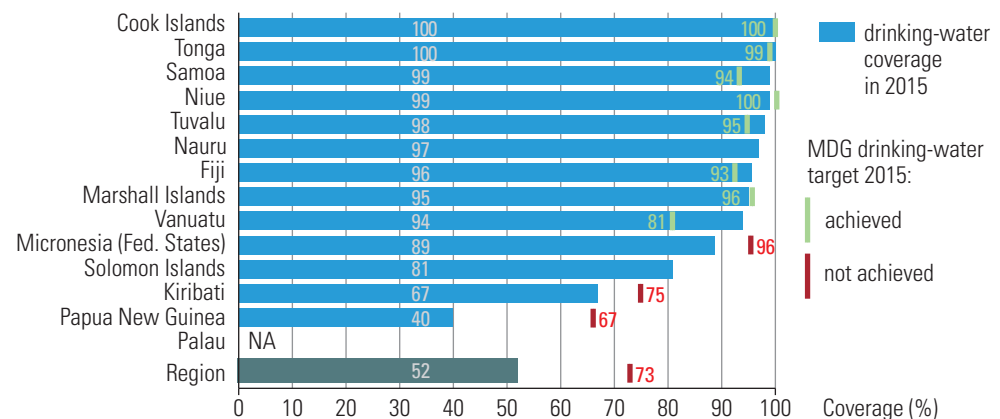


Source: country statistics from UNICEF and WHO (2015)

Eight out of 14 Pacific island countries have achieved the MDG drinking-water target.

Figure 34

Proportion of people using improved drinking-water in Pacific island countries in 2015 and respective MDG drinking-water targets



Source: country statistics from UNICEF and WHO (2015)

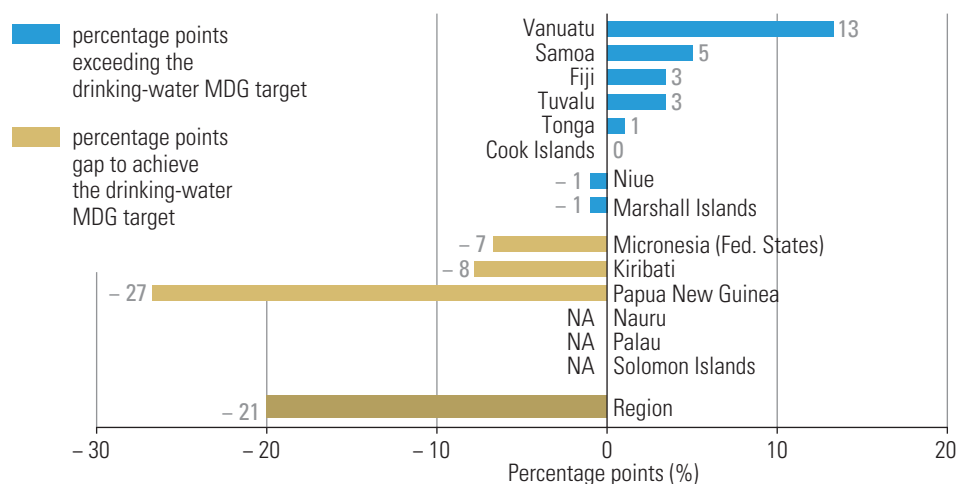
Notes:

1. The JMP has not provided 2015 improved drinking-water coverage statistics for Palau. The 2015 coverage for this country was estimated based on 1990 and 2010 statistics.
2. This report considers that the MDG target is achieved if the difference between the coverage in 2015 and the MDG target is equal to or greater than -1%.
3. The MDG drinking-water target is not available for Nauru, Palau and Solomon Islands.

About 71% of the Pacific island countries are on track to achieve the MDG drinking-water target.

Figure 35

Difference between the drinking-water coverage projected to 2015 and the MDG drinking-water target in Pacific island countries



Source: country statistics from UNICEF and WHO (2015)

Statistics on the use of improved drinking-water sources do not provide information on the quality of these services. Specifically, data are lacking on source accessibility in terms of collection time or distance, the quantity of water used, service continuity, water quality and conformity to standards, suitability for use by all including people with disabilities and older people, and affordability in terms of capital costs and operations and maintenance. The statistics assume that improved sources are more likely to fulfil the above conditions than unimproved sources but there is no evidence to confirm this.

4.2.2 Regional analysis of drinking-water coverage at the MDG target year

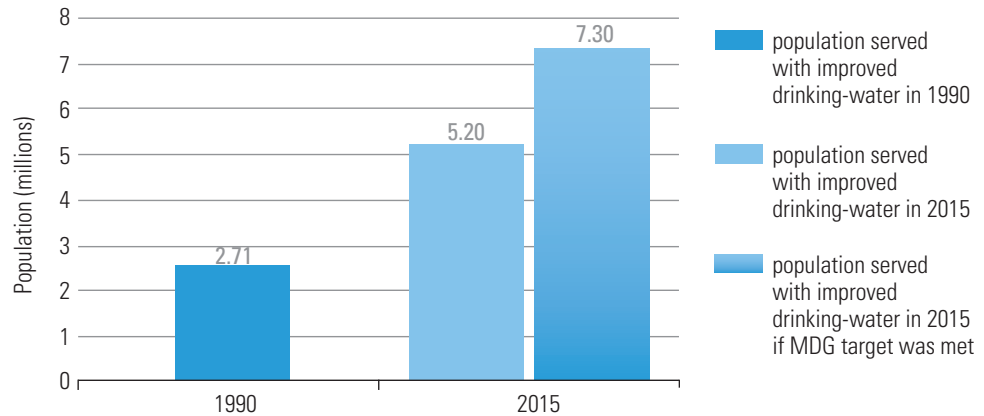
The MDG drinking-water target has not been met for the Pacific region. Achieving the target, would have required an additional 2.1 million people to be served in 2015 on top of the 5.2 million served (Fig. 36). Even if the target was achieved, about 2.7 million people would still remain unserved (Fig. 37).

The annual effort to build improved drinking-water infrastructure from 1990 to 2015 was about double that of improved sanitation. While about 100 000 people gained access to improved drinking-water annually, only 54 000 gained access to improved sanitation annually over the last 25 years.

Achieving the MDG drinking-water target would require an additional 4.6 million people gaining access to improved drinking-water from 1990 to 2015 which is almost double the increase of 2.5 million people occurring during the same time period.

Figure 36

Change in numbers of people served with improved drinking-water from 1990 to 2015 and MDG drinking-water target in the Pacific region

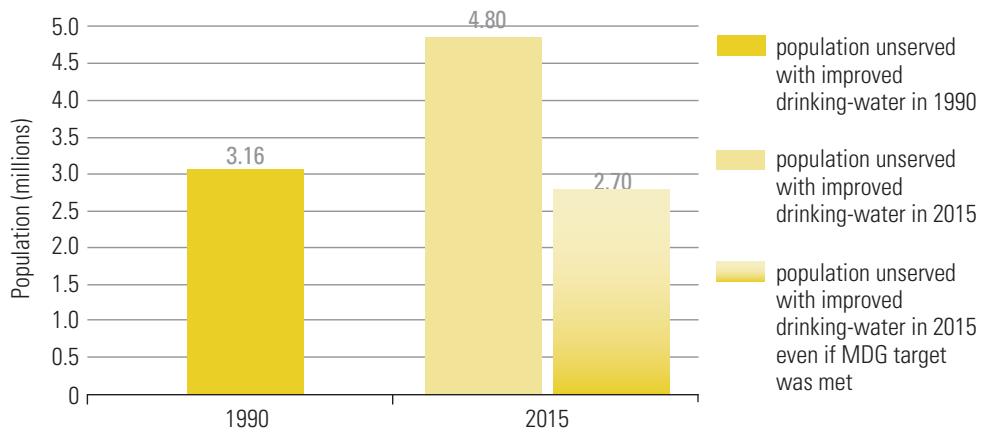


Source: country statistics from UNICEF and WHO (2015)

Achieving the MDG drinking-water target would require that the population not using improved drinking-water in 2015 should be 2.7 million rather than the actual 4.8 million unserved.

Figure 37

Change in numbers of people unserved with improved drinking-water sources from 1990 to 2015 and MDG target in the Pacific region



Source: country statistics from UNICEF and WHO (2015)

4.3 Challenges towards universal sanitation and drinking-water coverage

4.3.1 The JMP definition of improved and unimproved sanitation and drinking-water

The definitions of safe drinking-water and basic sanitation, and the methods for monitoring MDG target 7.C on drinking-water and sanitation, have been specified by the JMP to allow comparability of statistics over time and between countries.

SANITATION

The United Nations Millennium Project Task Force on Water and Sanitation defines basic sanitation as “the lowest cost option for securing sustainable access to safe, hygienic and convenient facilities and services for excreta and sullage disposal that provides privacy and dignity while ensuring a clean and healthful living environment both at home and in the neighbourhood of users” (Lenton, Wright, Lewis, 2005). WHO refers to sanitation as the provision of facilities and services for the safe disposal of human urine and faeces.

To date, the JMP has been unable to report on coverage according to this definition due to the limited data available through household surveys. From the year 2000 to date, the JMP has been reporting on the use of technologies that would be likely to fulfil the requirements of a “basic sanitation” facility. Such technologies are called “improved sanitation” and are indicated in Table 1.

Table 1. Sanitation categories of technologies according to the JMP

JMP sanitation categories	Description	Technologies
Improved sanitation facilities*	Facilities that are likely to ensure hygienic separation of human excreta from human contact.	Flush or pour-flush to: – piped sewer system – septic tank – pit latrine Ventilated improved pit latrine (VIP) Pit latrine with slab Composting toilet
Shared sanitation facilities	Sanitation facilities of an otherwise acceptable type shared between two or more households. Only facilities that are not shared or not public are considered improved.	Same as above but shared by two or more households
Other unimproved sanitation facilities	Facilities that do not ensure hygienic separation of human excreta from human contact.	Flush or pour-flush to elsewhere** Pit latrine without slab or open pit Bucket latrine Hanging toilet or hanging latrine
Open defecation	Human faeces disposed of in fields, forests, bushes, open bodies of water, beaches or other open spaces or disposed of with solid waste.	Absence of sanitation facilities.

* Only facilities that are not shared or public are considered improved

** Excreta are flushed to the street, yard or plot, open sewer, a ditch and a drainage way.

Source: Based on WHO, UNICEF (2013)

A more accurate way to determine whether a facility meets the UN definition of “basic sanitation” could be to evaluate these facilities against a series of criteria for safe, affordable, well-maintained facilities. Flowchart 1 presents one such framework that considers the UN definition and the outcomes of the discussion on JMP post-2015 water, sanitation and hygiene (WASH) targets. The working group was tasked with developing technical proposals for enhanced goals, targets and indicators for global WASH monitoring after 2015. Flowchart 1 indicates the implication of considering issues such as type of technology (improved, unimproved), safe excreta disposal, privacy (including shared and not shared sanitation facilities), hygiene (cleanliness, flies) and affordability. Sanitation facilities under the definition of “improved sanitation” may or may not meet such crucial conditions. Section 4.3.2 of this report indicates that the JMP is moving towards new targets and indicators that might lead to a better understanding of national and global sanitation status.

DRINKING-WATER

The definition of safe drinking-water by the United Nations Millennium Project Task Force on Water and Sanitation (2005) is “water that is safe to drink and available in sufficient quantities for hygienic purposes”. Safety means that the water should be free from contamination by pathogens, hazardous chemicals or radiological hazards. Drinking-water includes water used for drinking (direct ingestion), cooking, personal hygiene and similar uses.

Limitations in data mean that the JMP, to date, has not been able to report on coverage against the criteria of availability, safety, quantity, affordability and accessibility. The JMP reports on the use of improved drinking-water sources as a proxy, per the definitions below (Table 2).

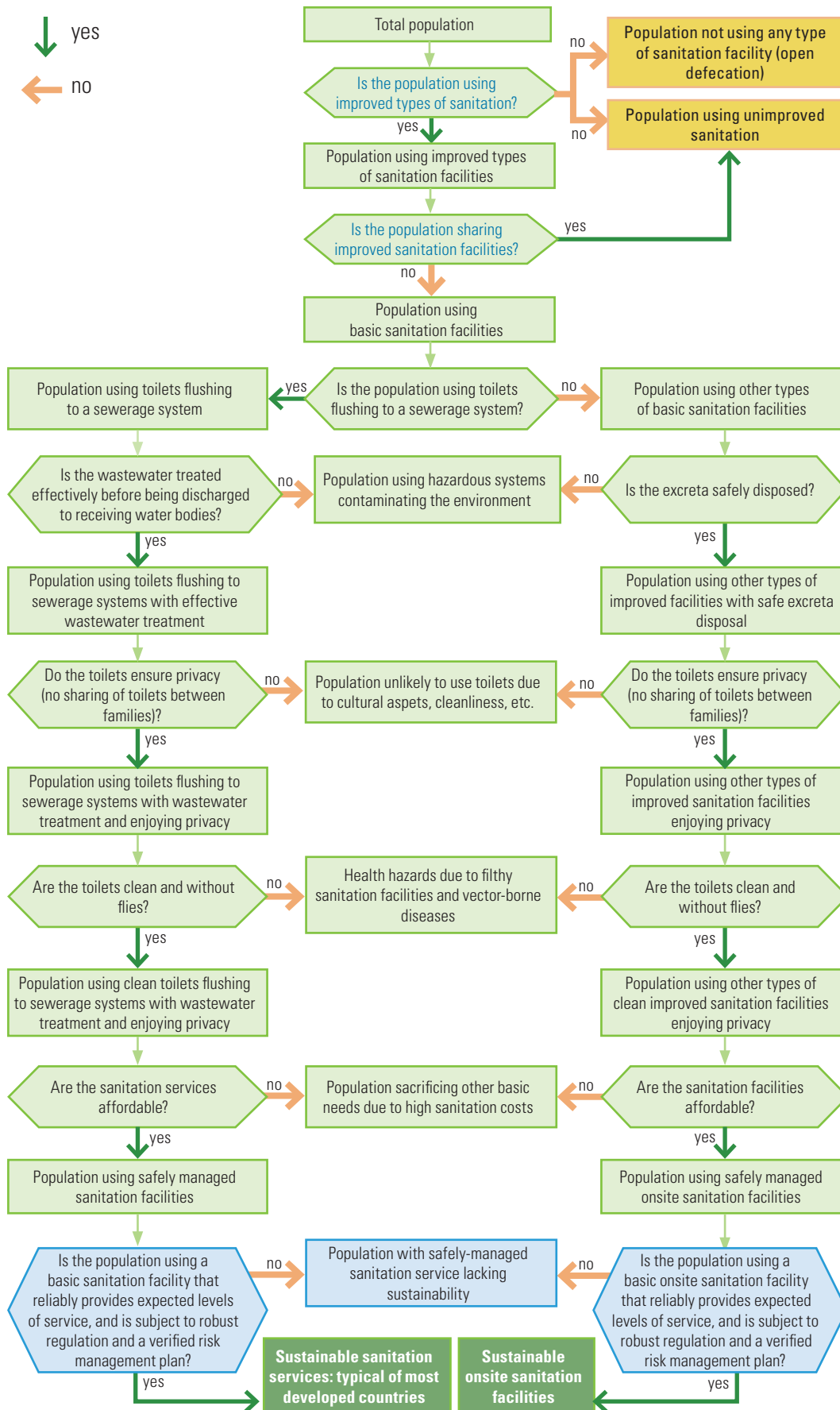
Table 2. Drinking-water categories of technologies according to the JMP

JMP sanitation categories	Description	Technologies
Piped water on premises	Piped household water connection located inside the user’s dwelling, plot or yard	Piped household water connection
Other improved	Facilities that do not provide piped drinking-water within the household but that are likely to provide safe drinking-water	Public taps, standpipes, tube wells, boreholes, protected dug wells, protected springs, rainwater collection
Other unimproved drinking-water sources	Facilities that are unlikely to provide safe drinking-water	Unprotected dug well, unprotected spring, cart with small tank/drum, bottled water*
Surface water	Use of drinking-water directly from surface water sources	River, dam, lake, pond, stream, canal, irrigation channels

* Bottled water is considered to be unimproved when there is absence of another source of improved drinking-water for cooking and hygiene purposes.

Source: based on WHO, UNICEF (2013)

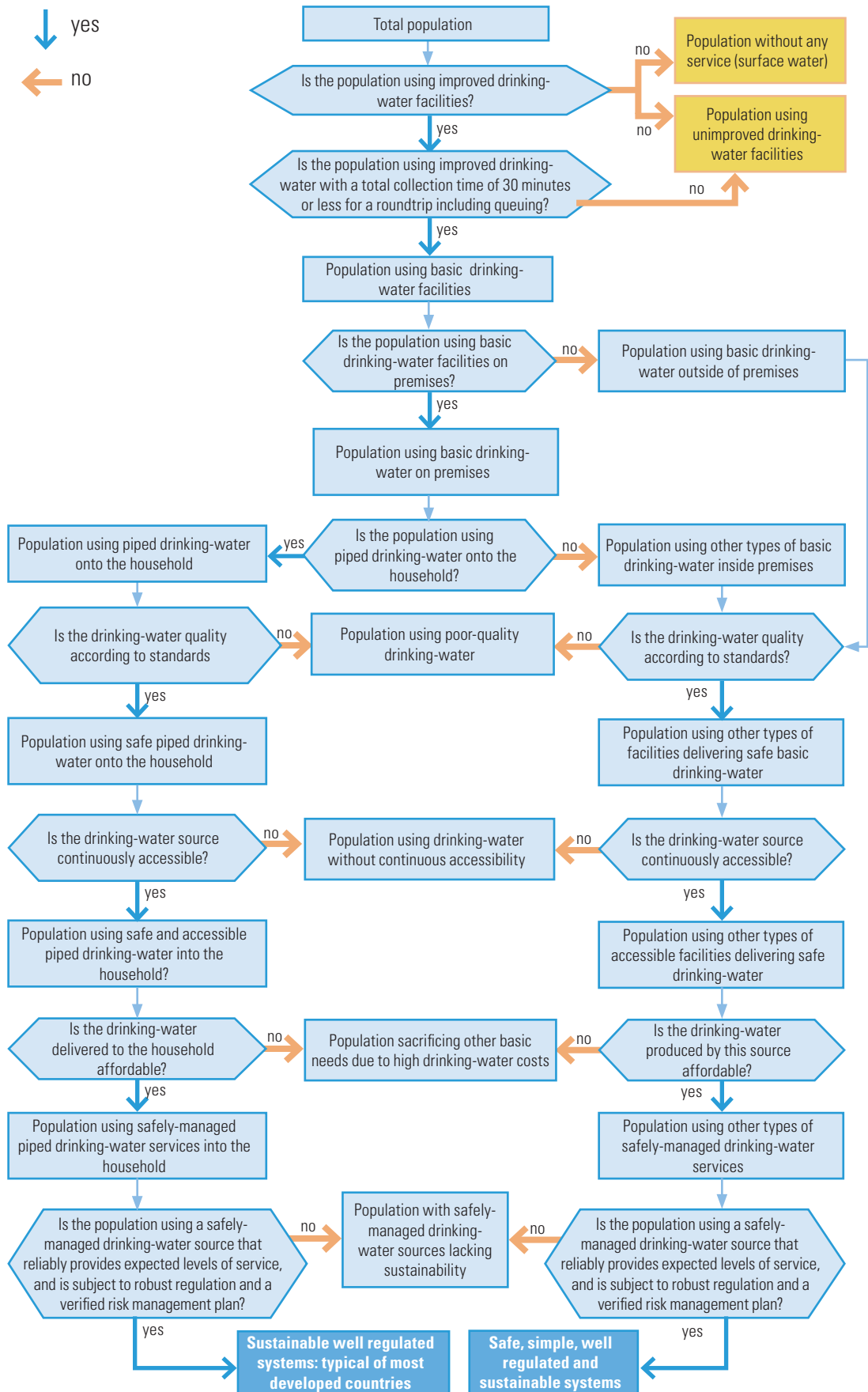
Flowchart 1. Levels of sanitation services according to different requirements



Source: based on concepts from Lenton, Wright, Lewis, (2005) and WHO, UNICEF (2015b)

Note: in the flowchart rectangles refer to numbers (or %) of people resulting from the questions in the “diamonds”.

Flowchart 2. Levels of drinking-water services according to different requirements



Source: based on concepts from Lenton, Wright, Lewis, (2005) and WHO, UNICEF (2015b)
 Note: in the flowchart, rectangles refer to numbers (or %) of people resulting from the questions in the “diamonds”.

A more accurate way to determine whether a facility meets the UN definition of safe drinking-water could be to evaluate these facilities against a series of criteria for safe, simple, accessible, affordable, and well-maintained facilities. Flowchart 2 indicates how the use of improved drinking-water may or may not meet crucial conditions. The global and national monitoring processes may be refined along these lines to provide policy- and decision-makers with a more complete set of statistics as described in section 4.3.2. Box 2 describes the sector monitoring and reporting approach in Vanuatu.

BOX 2. Monitoring drinking-water, sanitation and hygiene in Vanuatu

As in many Pacific island countries, the water supply, sanitation and hygiene information base in Vanuatu is recognized to be poorly established, unreliable and outdated. This report shows that Vanuatu is likely to meet its 2015 MDG water supply target, but the data used by the JMP to come to this conclusion are widely believed to be unrepresentative, with varying interpretations by surveyors of “improved” water supply used by households. While water supply and sanitation coverage in Vanuatu is above the Pacific average, the aggregate figures do not reflect the true situation in rural areas where approximately 75% of the population resides.

The lack of a credible baseline of rural water supply and sanitation coverage hinders effective programme planning and evaluation. Without water supply and sanitation coverage data that can be linked to social indicators analysed spatially, there is a limited evidence-base for equity-based or risk-informed programme planning and resource allocation. For these reasons, the 2008 Vanuatu National Water Strategy and Implementation Framework called for a strengthened regulatory role for the Department of Geology, Mines, and Water Resources (DGMWR) and mandated it to establish a national water resources inventory and undertake routine sector monitoring.

In response, the DGMWR has prioritized improving its capacity for monitoring, reporting and civil society coordination as they move towards fulfilling their mandates for sector regulation and oversight. To implement this, DGMWR is in the process of collecting data for a national water resources inventory, with support from the World Bank. DGMWR has piloted the use of Akvo FLOW monitoring software on smartphones to enable ongoing real-time sector monitoring and reporting. Expected benefits of this pilot include greater ownership and capacity development of DGMWR staff, greater accuracy of data collection, simplified data management and mapping, and a platform for sector coordination.

If the application of this approach for sector monitoring and reporting turns out to be successful, this model could potentially be applied by other Pacific island countries. Lessons learnt will also allow for continuous improvement of the system.

Source: UNICEF, Suva

4.3.2 Sustainable Development Goals (SDGs) targets for drinking-water and sanitation

In September 2015, the UN General Assembly adopted a framework of 17 SDGs covering a range of drivers across the three pillars of sustainable development (UN, 2015). Of direct interest to this document is Goal 6, which is formulated as follows: Ensure availability and sustainable management of water and sanitation for all.

The following targets were ratified by the UN General Assembly to monitor **SDG Goal 6:**

Target 6.1: By 2030, achieve universal and equitable access to safe and affordable drinking-water for all.

Target 6.2: By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations.

Target 6.3: By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.

Target 6.4: By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.

Target 6.5: By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate.

Target 6.6: By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes.

Target 6a: By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies.

Target 6b: Support and strengthen the participation of local communities in improving water and sanitation management.

4.3.3 Implications of the SDGs targets and indicators to Pacific island countries

The JMP proposed several indicators to measure targets 6.1 and 6.2 and proposed definitions of targets and monitoring methods as indicated in Annex 6. Data for all indicators would be disaggregated according to the following categories for reporting: rural and urban; wealth quintiles; informal and formal urban settlements; and disadvantaged groups and the general population. The proposed targets are ambitious. It will be difficult to monitor the progress, especially given the lack of baseline data and national monitoring and reporting systems for many of the criteria. For Pacific island countries, the implications would be significant as explained below.

SDG Goal 6 Target 6.1: *By 2030, achieve universal and equitable access to safe and affordable drinking-water for all (including schools and health-care facilities)*

There are two main dimensions to this target as follows:

- a. By 2030, achieve universal coverage with “basic drinking-water”, which means that everyone will have access to an improved drinking-water source with a total collection time of no more than 30 minutes for a roundtrip including queuing.

Improved drinking-water sources (current MDG “improved” indicator) include the following types: piped water into dwelling, yard or plot; public taps or standpipes; boreholes or tubewells; protected dug wells; protected springs and rainwater.

Figure 38 indicates the enormous effort required in the Pacific region to achieve universal coverage with “basic drinking-water sources” by 2030. Rather than providing services to an additional 100 000 people annually as occurred from 1990 to 2015, achieving

universal coverage will require that this number is quintupled to 500 000 additional people served annually from 2015 to 2030.

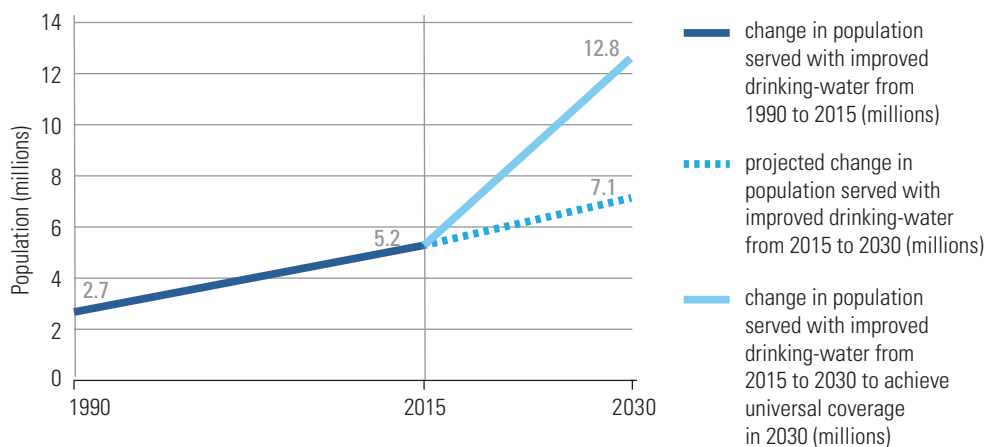
b. By 2030 achieve universal coverage with “safely managed drinking-water services”
SDG target 6.1 aims not only to achieve universal coverage with basic drinking-water services but also to progressively improve access to ‘safely managed’ drinking-water facilities located on premises, available when needed and free of faecal (and priority chemical) contamination.

The implication to the Pacific region is huge in terms of ensuring universal coverage with basic drinking-water in the coming 15 years as well as ensuring that the services are safely managed as indicated above. Monitoring “safe management” will also be a major challenge to the JMP and Pacific island countries (see Annex 6).

Achieving universal coverage with improved drinking-water would require an increase in the population served of about 7.6 million people in just 15 years. Against this background, if the current trend is confirmed, the additional numbers of people served from 2015 to 2030, will be only 1.9 million.

Figure 38

Population served with improved drinking-water in 1990 and 2015 in the Pacific region and universal access to improved drinking-water in 2030



Source: country statistics from UNICEF and WHO (2015)

SDG Goal 6 Target 6.2: *By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations (including schools and health-care facilities)*

Similarly to drinking-water, there are two main dimensions to this target as follows:

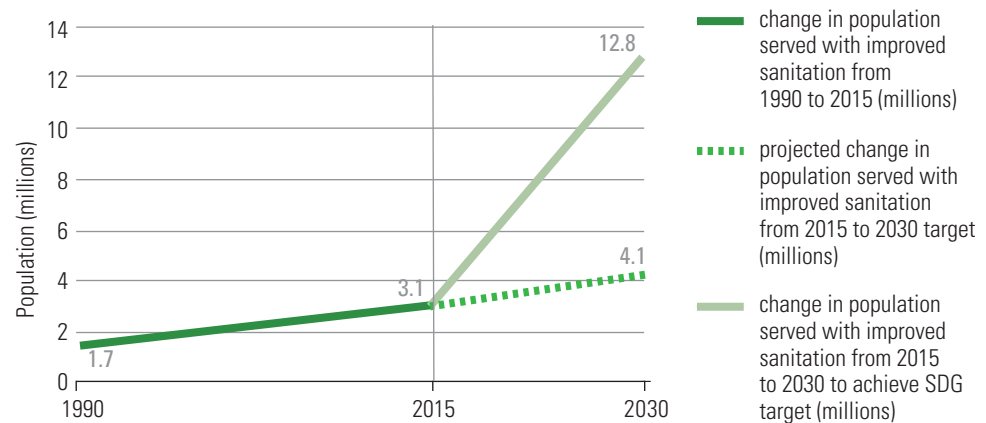
a. By 2030, achieve universal coverage with “basic sanitation”, which means that everyone will have access to a basic sanitation facility not shared with other households. Basic sanitation facilities (current MDG “improved” indicator) include the following types: flush or pour flush toilets to sewer systems, septic tanks or pit latrines, ventilated improved pit latrines, pit latrines with a slab, and composting toilets.

Figure 39 indicates that the Pacific region will need to radically increase their investment and effort to ensure universal basic sanitation coverage by 2030. The current trend will lead to a total population served in 2030 equal to one-third of the amount required to attain the universal coverage with basic sanitation. Rather than providing services to an additional 56 000 people annually as occurred from 1990 to 2015, achieving universal coverage will require that this number is increased twelve fold from 2015 to 2030 to 650 000 additional people served annually.

Achieving universal access to basic sanitation will require that the current annual level of effort in building new sanitation infrastructure is multiplied by 12 from 2015 to 2030.

Figure 39

Population served with basic sanitation in 1990 and 2015 in the Pacific region, and SDG universal basic sanitation target (2030)



Source: country statistics from UNICEF and WHO (2015)

b. By 2030 achieve universal coverage with “safely managed sanitation”

SDG target 6.2 aims at both achieving universal coverage with basic sanitation (current “improved sanitation”) but also the basic sanitation facilities should be “safely managed”. According to the JMP, safely managed facilities are those where the excreta are safely disposed in situ or transported to a designated place for safe disposal or treatment.

The implication to the Pacific region is huge both in terms of the daunting endeavour of ensuring universal coverage with basic sanitation over the forthcoming 15 years but also ensuring that the services are safely managed as indicated above. Monitoring “safe management” will also be a major challenge to the JMP and Pacific countries (see Annex 6).

Achieving the SDG target 6.2 implies also eradicating open defecation. The statistics in this publication indicate that about 1.26 million people practise open defecation in the Pacific region. Eradicating open defecation in the region requires the provision of sanitation facilities (improved or not) to about 84 000 people annually from 2015 to 2030, and preventing any new citizens from practising open defecation. This means a drastic change is required to address the current widespread practice of open defecation. This practice increased in the region from 827 000 in 1990 to 1.26 million people in 2015.

Achieving such a target for Pacific island countries will require sustained substantive financial effort and a change in priorities and behaviours involving governments, international agencies and civil society.

4.3.4 Financial challenges

Achieving the new targets requires increased government and development partner resources, as well as new sector policies and service-delivery strategies. Limited data are available on water and sanitation sector investments. It is fundamental that the post-2015 monitoring and planning mechanisms in the Pacific region include information on past expenditures and future national needs to finance and institutionalize strategies.

The infrastructure cost of achieving universal coverage of basic drinking-water supply by 2030 is about US\$ 83 million per annum. This is approximately 0.35% of the region's GDP. The infrastructure cost of achieving universal coverage of adequate sanitation by 2030 is about US\$ 80 million per annum, representing 0.33% of the region's GDP. Hutton (2012) indicates that the economic losses associated with lack of improved drinking-water and sanitation services represent about 1.6% of the region's GDP. In the absence of data on sector investments, this report estimates the capital investments based on approximate costs of infrastructure in the Pacific region derived from Hutton (2012), which found these to be US\$ 163 per person for basic drinking-water supply and US\$ 123 per person for adequate sanitation.

The cost of inaction is significant. A recent study on the costs of inadequate drinking-water, sanitation and hygiene in South Tarawa, Kiribati, found an economic cost per annum equivalent to 2–4% of the 2013 GDP (Box 3).

BOX 3. Poor drinking-water and sanitation impose high costs on Kiribati

A report prepared by the Asian Development Bank (ADB, 2014) demonstrated that inadequate water supply, sanitation and hygiene in South Tarawa, Kiribati's main urban centre, cost between US\$ 3.4 million–US\$ 6.8 million per year, equivalent to 2% – 4% of the 2013 GDP. South Tarawa's population of around 50 000 occupies an area of just over 15 km². This low-lying atoll, has limited freshwater resources, which are easily contaminated because of the high water table and soil characteristics. Kiribati is also highly vulnerable to climate change. Residents receive piped water for only two hours every two days because of high leakage from the system and limited freshwater supplies. Poorly functioning sanitation systems and inadequate sanitation practices among the local population contribute to groundwater and marine environment pollution.

The annual health costs from poor water supply and sanitation alone (not considering environmental deterioration and tourism) were found to be substantial, equivalent to between US\$ 500–1000 per household in South Tarawa. The study shows that vulnerable groups have the most to gain from improvements, as they are more likely to suffer from illnesses including diarrhoeal diseases.

The report notes the role of the public and private sectors in reducing the economic burden of poor water and sanitation services. Priorities include the need to increase government investment, improve cost recovery and enhance community understanding of the links between water, sanitation, hygiene and health.

A major finding of this report is that an integrated approach to improve water supply and sanitation infrastructure, hygiene behaviour, water storage practices at the household and village levels would have the greatest impact in reducing the burden of disease and stimulating economic development in South Tarawa.

Source: ADB (2014)

SECTION 5

Sanitation and drinking-water: powerful determinants of health

Safe drinking-water, adequate sanitation facilities and good hygiene are the most effective measures to prevent deaths and illnesses from diarrhoea and other water- and sanitation-related diseases in the 20th century. These diseases continue to inhibit the learning abilities of millions of school-aged children in the Pacific region. This section provides an overview of the status of water, sanitation and health-related issues in the region.

5.1 Health

5.1.1 Water-, sanitation- and hygiene-related diseases

Fewtrell et al. (2007) categorize water- and sanitation-related diseases as follows:

Drinking-water, sanitation and hygiene:

- Infectious diarrhoea
- Intestinal nematode infections (ascariasis trichuriasis, hookworm disease, other)
- Schistosomiasis
- Trachoma
- Lymphatic filariasis
- Malnutrition and consequences of malnutrition on most infectious diseases

Water resources management:

- Malaria
- Onchocerciasis
- Dengue
- Japanese encephalitis

Safety of water environments:

- Drowning

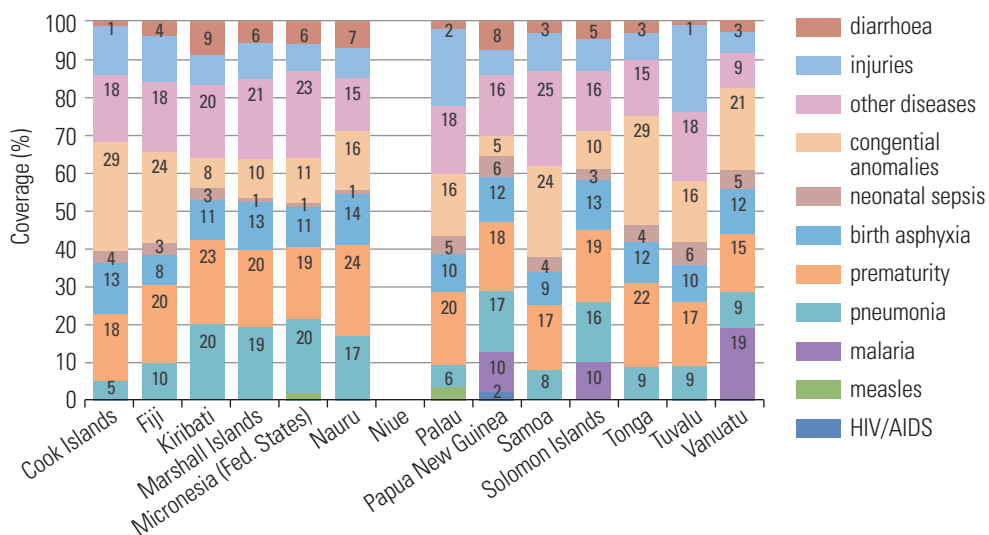
5.1.2 Diarrhoeal diseases

Diarrhoeal diseases, which are largely attributable to unsafe drinking-water, unsanitary excreta disposal facilities and inadequate hygiene, are still a major cause of child deaths in Pacific island countries (Fig. 40).

Water-related diseases including diarrhoeal diseases and malaria are a significant cause of death in under-5 children in the region. Many other causes of death are indirectly influenced by lack of basic sanitation, hygiene and safe drinking-water.

Figure 40

Distribution of causes of death among children under-5, Pacific island countries, 2010



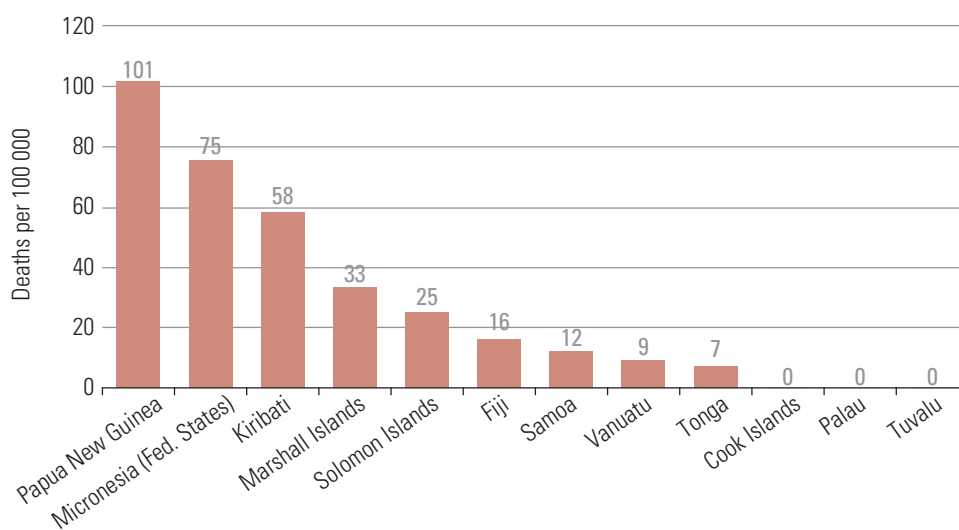
Source: WHO (2013)

Case management has improved, but high mortality rates due to diarrhoeal diseases continue in low-income countries, especially Kiribati, Nauru and Papua New Guinea (Fig. 41). More than 1000 children die from diarrhoeal disease each year in the region.

Although the treatment of diarrhoeal diseases has reduced considerably the mortality of children under-5, more than 1000 people still die from diarrhoea in the Pacific region annually. The highest rates per 100 000 children occur in Kiribati and Papua New Guinea.

Figure 41

Deaths due to diarrhoeal diseases per 100 000 population in Pacific island countries, 2010



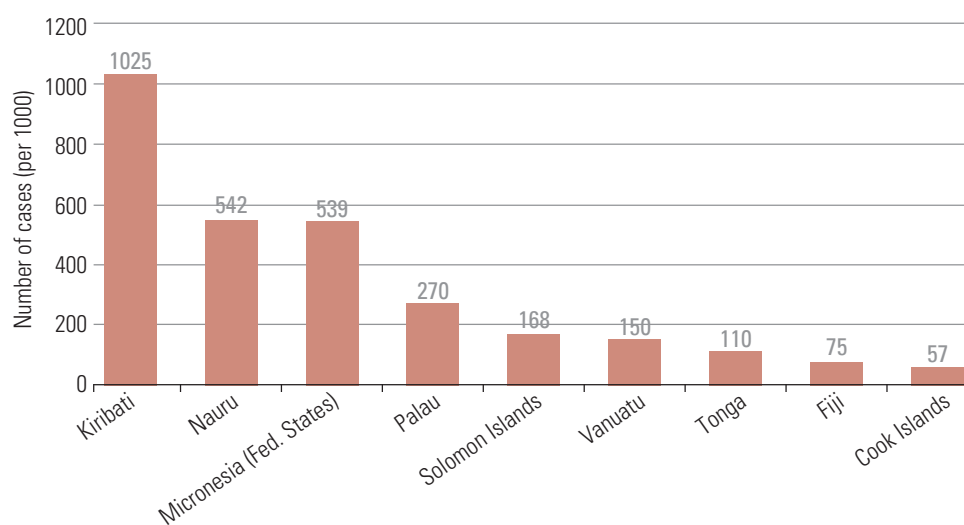
Source: country mortality figures from CHERG (2012); Population from UN (2014)

Unfortunately the data on diarrhoeal disease morbidity are unreliable for the region. Reported incidence rates from Pacific island countries to WHO (2014a) are summarized in Figure 42.

Information provided by ministries of health of the region indicates that there is a huge disparity between countries in annual incidence rates of diarrhoeal diseases per 1000 children under-5.

Figure 42

Annual incidence rates of diarrhoeal diseases per 1000 children under-5 in selected Pacific island countries, 2006–2010



Source: Country population, UN (2014)
Incidence rates of diarrhoeal diseases, WHO Regional Office for the Western Pacific (2014)

If global estimates are valid for this region, about 54% of diarrhoea cases should be attributable to unsafe water, inadequate sanitation and poor hygiene (WHO, 2014b). Use of safe drinking-water, adequate sanitation and good hygiene behaviours would prevent most diarrhoeal cases. From the primary sources of contamination (human and animal excreta and animal products), contamination cascades through different routes to humans, who contract different types of sanitation-related diseases. For each of these routes there is an opportunity to build barriers (Fig. 43).

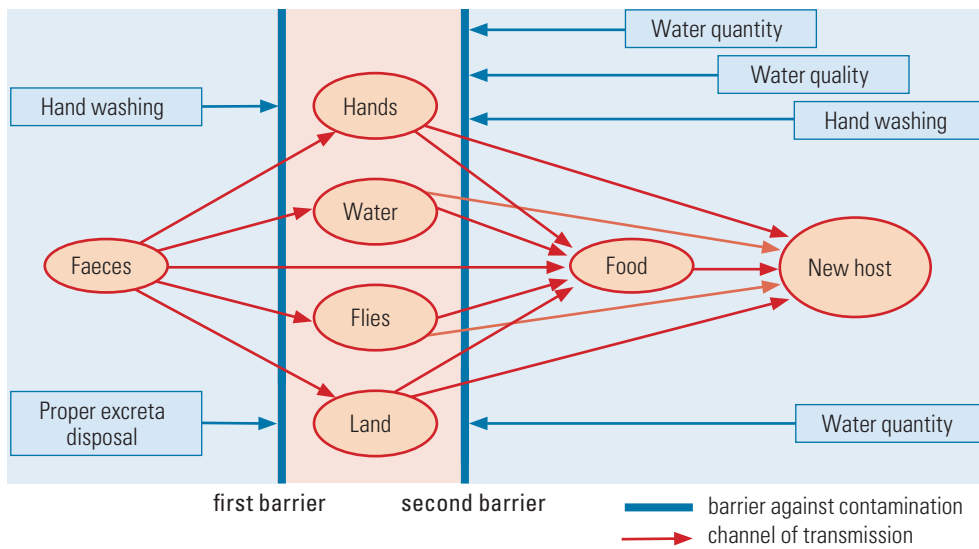
The incidence rate of diarrhoeal disease has decreased minimally over the past decades. However, the death rate has decreased consistently. This is an indication that while case management approaches and practices are improving, prevention (good sanitation, hygiene, drinking-water, food safety) is not progressing effectively (WHO et al., 2010).

5.1.3 Under-5 mortality rate

With a few exceptions (Nauru and Niue), Pacific island countries saw their under-5 mortality rates drop considerably from 1990 to 2011. Still the under-5 mortality rate of Papua New Guinea is nearly 13 times that of Australia (Fig. 44).

Figure 43

Routes of human contamination from excreta

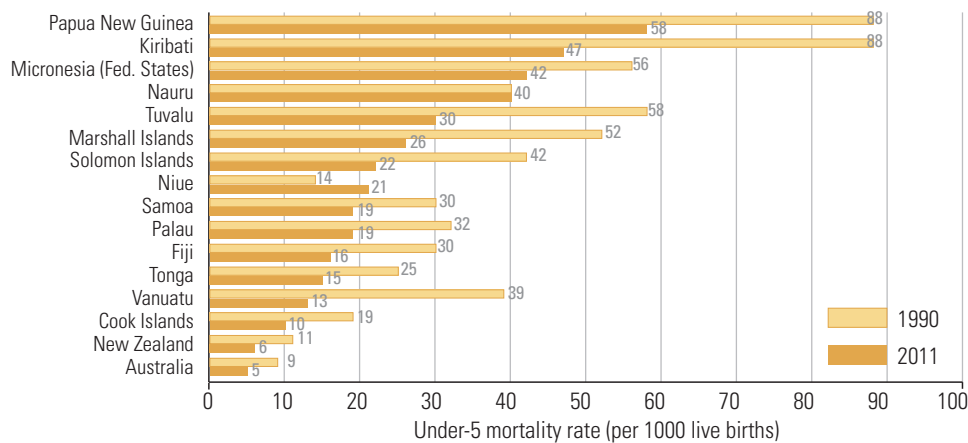


Source: adapted from Wagner E.G. and Lanoix J.N. (1958)

Under-5 mortality rates reduced remarkably from 1990 to 2011 in most Pacific island countries. Nevertheless, children in most Pacific island countries are 2 to 13 (median 5) times more likely to die before age 5 than those in Australia and New Zealand.

Figure 44

Under-5 mortality rate in Pacific island countries, 1990 and 2011

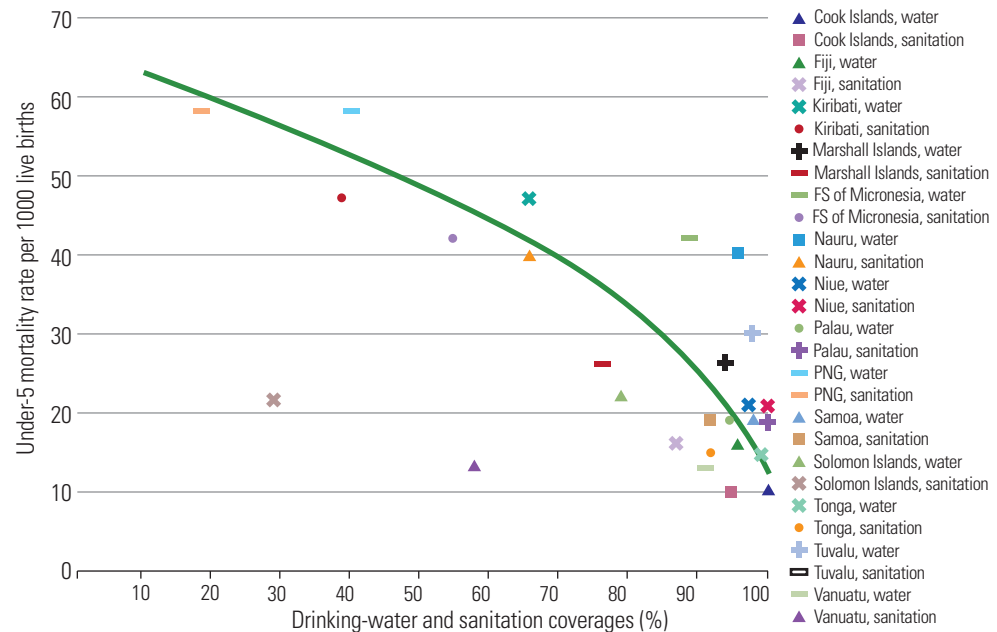


Source: WHO (2013)

Drinking-water and sanitation coverages and under-5 mortality are clearly linked. Figure 45 indicates that under-5 mortality rates per 1000 live births reduce as water and sanitation coverage increases.

Figure 45

Coverage with improved drinking-water and sanitation compared with under-5 mortality rate per 1000 live births, Pacific island countries, 2012



Source: WHO (2013) (under-5 mortality); UNICEF and WHO (2015) (coverage)

BOX 4. Drinking-Water Safety Plans making a difference in the Pacific region

The Drinking-Water Safety Plan (DWSP) approach was introduced in the region in 2006. Presently, 12 Pacific island countries have implemented DWSPs, for urban water supplies and rural and community-managed schemes. In the Marshall Islands and Tonga a simplified version DWSPs, called sanitary surveys, have been developed and implemented for rainwater harvesting systems at the household level.

The Australian Government Department of Foreign Affairs and Trade is working with WHO to expand the DWSP approach to rural and community-run water-supply schemes in four countries: Cook Islands; Samoa; Tonga; and Vanuatu until 2016.

The benefit of developing and implementing a DWSP has been demonstrated by Palau through a cost-benefit analysis conducted by SOPAC, which estimates a return of US\$ 6 for every US\$ 1 invested in DWSP implementation (Hasan and Gerber, 2010), including clear health-related benefits such as reduced incidence of gastro-intestinal disease from unsafe drinking-water and reduced health-care costs.

DWSPs are influencing national drinking-water policies. In Fiji for example, the Constitution acknowledges the value of the DWSP approach and encourages community-run schemes (especially all new drinking-water scheme development) to implement a water safety management plan. The Water Authority of Fiji (WAF) is rolling out DWSPs for all its supplies after DWSPs developed for the Tamavua and Waila treatment plants in 2008 led to 100% and 95% (WAF, 2014) compliance respectively with the National Drinking-water Standards in 2012 and 2013. This achievement is linked to the improvements identified by the DWSPs which were implemented through an upgrade programme. WHO is also supporting WAF to monitor and evaluate DWSPs by linking them with goals, objectives, targets and indicators, and improving WAF's water quality monitoring programme.

Source: Hasan, T and Gerber, F. (2010). Economics of Drinking-water Safety Planning: An Advocacy Tool. SOPAC Miscellaneous Report 714, SOPAC Secretariat, Suva, Fiji; Kamal Singh, Supervisor Production, Water Authority of Fiji. Personal communication. 5 March 2014.

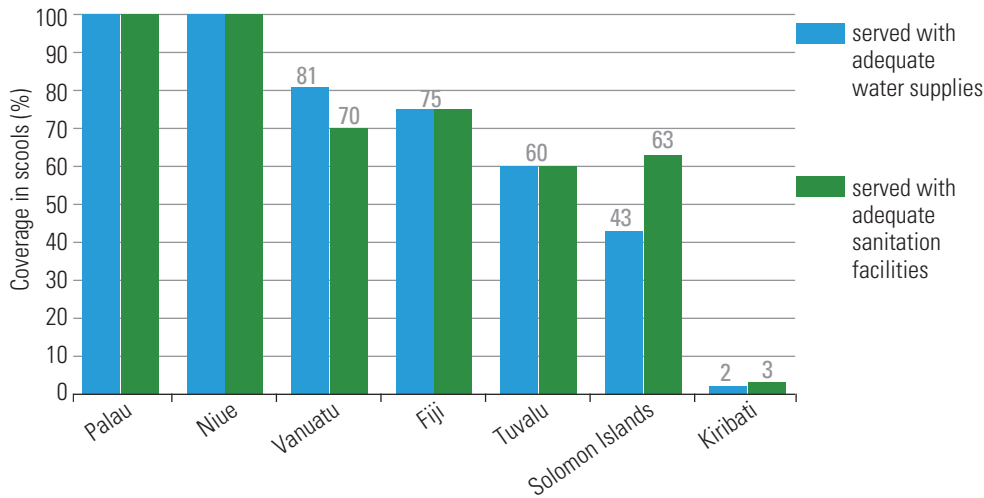
5.2 Water and sanitation in schools

Poor sanitation, water scarcity, poor water quality and inappropriate hygiene behaviours are major contributors to under-5 mortality. Disease spreads quickly where handwashing facilities are not available, and where toilets are in disrepair. Too often, schools are places where children become ill (UNICEF, 2012).

Fulfilling every child’s right to water, sanitation, hygiene facilities and health education remains a challenge for policy-makers, school administrators and communities in many Pacific island countries. This is true even for countries that made good progress in national water and sanitation coverage, such as Fiji and Vanuatu.

The availability of safe drinking-water and adequate sanitation in schools varies widely in Pacific island countries, ranging from 2% coverage in Kiribati to 100% coverage in Niue and Palau (Fig. 46). Data are not available for all countries and no data are available on access to handwashing facilities with soap in the schools of Pacific island countries.

Figure 46
Sanitation and water in schools in selected Pacific island countries



Source: statistics from UNICEF Fiji (unpublished)

In most countries, schools report data on their access to water and sanitation through national Education Management Information Systems (EMIS). These information systems have enabled annual facility tracking by ministries responsible for education and drinking-water. As data are mostly self-reported, reporting standards vary and cannot be compared across the region. In Kiribati, for example, only facilities that meet the minimum standards set by the Ministry of Education and Ministry of Public Works and Utilities are included, resulting in their comparatively low school access rates of 2% for drinking-water and 3% for sanitation.

In contrast, access rates in Solomon Islands consider any type of drinking-water or sanitation facility at schools, as minimum standards have not yet been approved nationally. Of those schools reporting the availability of water and sanitation facilities, some may not meet the needs of children because they do not provide a sufficient or regular quantity of water; have poor water quality; lack cleanliness or privacy in toilets; are designed inappropriately for young children or girls; or have other defects that compromise the ability of all students to make use of these facilities and safeguard their health. The data reported through the Solomon Islands Education Management Information System (SIEMIS) show that the average toilet-to-student ratio for all schools was 1:63 in 2012, with community high schools reporting a ratio of 1:94.

To ensure that all students and teachers can use improved drinking-water and sanitation facilities and benefit from hygiene education, the Solomon Islands Ministry of Health and Medical Services and Ministry of Education and Human Resources Development worked together to draft minimum standards for water and sanitation in schools. Both ministries have developed the draft standards in partnership with UN agencies and NGOs in the WASH Stakeholders Group and based on UNICEF (UNICEF, 2012) and WHO (Adams et al., 2009) guidelines.

Solomon Islands has focused on making WASH facilities available to young children, children with disabilities and menstruating girls by guiding inclusive designs and management strategies. Both ministries plan to develop specific guidance for menstrual hygiene management in schools, making Solomon Islands the only country in the region to dedicate resources to addressing the needs of late primary and secondary girls. Once the minimum standards are approved, schools will need guidance and support to upgrade facilities, improve school facility management and report accurately through SIEMIS.

Mounting pressures on fragile environments, including climate change, pose emerging threats to school drinking-water systems. In Tuvalu, most schools depend on rainwater harvesting, making them vulnerable to drought. In Kiribati, schools with wells are highly vulnerable to contamination from toilets and animals. Building resilience into school systems and managing risks to drinking-water quality is crucial to safeguard child health. Box 5 describes water and sanitation facilities in schools in Malaita Province, Solomon Islands.

BOX 5. Water and sanitation in Malaita Province, Solomon Islands

In Malaita Province, Solomon Islands, not all schools have toilet facilities. In some schools toilets for girls and boys are too close together, leading girls to avoid them if boys are inside or nearby. Ensuring safe water and sanitation facilities is even more critical at boarding schools in Malaita Province. For example, at one high school boarding students do not have private bathing facilities. The students bathe behind a makeshift screen before or after daylight.

Design and construction of high quality ablution blocks with flush toilets at schools may seem beneficial to students. However, in Malaita Province, some of these facilities ended up locked and unused when water was not available for flushing. These donor-funded ablution blocks had not been open to students since construction.

Source: UNICEF Fiji (unpublished)

5.3 Water and sanitation in health facilities

Health-care associated infections contribute to morbidity and mortality, and to a loss of health-sector and household resources worldwide. A considerable proportion of patients develop one or more preventable infections during a stay in hospital. In crisis situations, the number of infections worsens. In some circumstances, people may choose not to seek care because the available health-care facilities are not functioning or because treatment is uncertain due to shortages of water, electricity or supplies (Adams, J. Bartram, J. Chartier, Y, 2008). Health-care facilities include referral hospitals to village health posts, residential care accommodation and dental facilities. An example of good practices is provided in Box 6. Actions to improve health-care facilities in emergencies are indicated in Box 7. Health-care facilities require: use of safe drinking-water; low risks to health from microorganisms that grow in the environment; and physically clean and disinfected surfaces and tools (WHO, 2014).

The results of a WHO assessment in 2002 conducted in 22 developing countries showed that 18% to 64% of health-care facilities do not use proper waste disposal (WHO, 2014). The development of national policies, guidelines on safe practices, training and effective messaging can decrease the number of health-care associated infections. This will also impact visitors and communities through safe WASH practices.

For Pacific island countries, the evidence base on the status of drinking-water and sanitation facilities in health-care facilities needs to be improved to advocate investment in quality services.

BOX 6. WASH in health facilities in Fiji

Improved sanitation and water supply are essential to prevent infections and outbreaks in health facilities. The Fiji Ministry of Health and Medical Services adopted a WASH policy in health facilities in 1996. The policy has led to significant procedural and infrastructure changes. Infection control units were established in the three divisional hospitals and all sub-divisional hospitals to ensure health workers follow WASH principles.

An estimated 95% of health facilities in Fiji have flush toilets with piped water supply. Some isolated health centres and nursing stations, where piped systems are unavailable, use flush toilets operating on a water seal system.

Sanitation and hygiene practices are incorporated in all medical and nursing training courses and in-house trainings, and further advocated and monitored by the Ministry of Health and Medical Services-appointed infection control officers on a daily basis. Audits are conducted regularly and these are reported to management. As a result, no major hospital-based infections or outbreaks have been reported since the WASH policy was implemented.

Source: Fiji Ministry of Health and Medical Services

BOX 7. Essential temporary drinking-water, sanitation and hygiene interventions in health-care facilities

Where adequate long-term conditions may not be available, temporary measures can be implemented in health-care facilities to protect health:

- Provide safe drinking-water from a protected groundwater source (spring, well or borehole), or from a treated supply, and keep it safe until it is drunk or used. Untreated water from unprotected sources can be made safer by boiling, filtering and disinfection.
- Provide water for handwashing after going to the toilet and before handling food, before and after performing health care. This may be done using simple and economical equipment, such as a pitcher of water, a basin and soap, or wood ash in some settings.
- Provide basic sanitation facilities that enable patients, staff and carers to go to the toilet without contaminating the health-care setting or resources such as water supplies. This may include providing simple pit latrines with reasonable privacy. Note that the risk of transmission of soil-based helminths is increased with the use of defecation fields. The use of shoes or sandals provides protection from hookworm infections.
- Provide cleaning facilities so that staff can routinely clean surfaces and fittings to ensure that the health-care environment is visibly clean and free from dust and soil. Approximately 90% of microorganisms are present in visible dirt – cleaning can eliminate this dirt.
- Ensure that eating utensils are washed immediately after use. The sooner utensils are cleaned the easier they are to wash. Hot water and detergent, and drying on a stand are required.
- Reduce the population density of disease vectors. Proper waste disposal, food hygiene, wastewater drainage, and a clean environment are key activities to control the presence of vectors.
- Provide information about, and implement hygiene promotion so that staff, patients and carers are informed about essential behaviours to limit disease transmission in health-care settings and at home.

Source: Adams, J. Bartram, J. Chartier, Y, 2008

5.4 Gender, sanitation, hygiene and drinking-water

Pacific women in rural areas are often responsible for household drinking-water management, sanitation and health promotion. As such, women have often accumulated considerable knowledge on water-source location, water quality and storage methods. However, Government efforts geared towards improving the management of water resources and ensuring access to safe drinking-water and adequate sanitation, often overlook the central role of women.

The importance of involving women in the management of water and sanitation has been recognized by stakeholders globally. For example, the resolution establishing the International Decade for Action, “Water for Life” (2005–2015), calls for women’s participation in water-related development efforts.

In Tonga, efforts to strengthen the role of women in the provision of domestic drinking-water through rainwater harvesting have resulted in guidelines and a specific participa-

tory manual used by the Tonga Community Development Trust to support communities (SOPAC, 2004). Through the Village Women's Development Program, village operation and maintenance funds are managed by women to strengthen the sustainability of rainwater harvesting systems.

A research consortium in the Pacific, involving the Institute for Sustainable Futures at the University of Technology of Sydney, the International Women's Development Agency, Live and Learn Environmental Education, and World Vision Vanuatu, studied how gender equality can be supported and evaluated within the context of water, sanitation and hygiene.

Selected communities in Vanuatu identified far-reaching gender equality outcomes of their community WASH projects. Women reported positive changes in gender relations in their families, households and communities, and greater inclusion of women in community decision-making processes beyond WASH issues. Women also reported a reduction in violence at the household level and were able to reduce their labour in collecting water and meet their own needs for WASH facilities, saving them time and improving their health and dignity.

The GEF-funded Pacific IWRM Programme has advocated mainstreaming gender into Integrated Water Resources Management (IWRM) with recommendations: for future projects to commission project-specific gender analysis and gender action plans; strengthen gender-disaggregated data collection including qualitative and quantitative data; encourage the adoption of gender champions within national committees; support gender training and capacity-building at all levels; and ensure the continuous provision of gender inputs (GEF, 2012).

The Asian Development Bank has prioritized gender equality as a driver of change in their 2020 Strategy. A gender checklist on water and sanitation has been developed to provide guidance at all stages of ADB's programme cycle in determining access to resources, roles and responsibilities, constraints, and priorities and in designing appropriate gender-sensitive strategies, components and indicators to respond to gender issues (ADB, 2006).

SECTION 6

The challenge of urbanization in Pacific island countries

“The urban water challenge must be recognized for what it really is – a crisis of governance, weak policies and poor management, rather than a scarcity crisis. We need to shore up water security against added problems of pollution, and climate change. We need innovative ideas and good practices to implement.”

Joan Clos, Executive Director of UN-Habitat
Keynote address at World Water Day 2011, Cape Town, South Africa

6.1 Urbanization in Pacific island countries

The Pacific region is rapidly urbanizing. About 1.7 million people are estimated to live in urban areas in the Pacific region, representing one in every five Pacific islanders (UN, 2014a) (see Section 3). Urban permanence is evident in third and fourth generation urban families. Towns and cities continue to attract people with employment opportunities and services including schools and health facilities.

Urban lifestyles are significantly different to outer-island or rural life, which is often dominated by subsistence livelihoods. Pacific urban centres produce approximately 60–80% of the region’s GDP, largely through the (tertiary) services sector employing the majority of people in the formal employment sector. The rural-urban interface is important for the maintenance of social and cultural linkages and market and livelihoods relationships.

Urban areas can be small, both in terms of population size and land area. “Urban” can refer to groups of connected villages stretching along the coastline (e.g. Apia in Samoa) or villages on one island (e.g. Rarotonga in Cook Islands, Tarawa in Kiribati, Nauru, Koror in Palau, Funafuti in Tuvalu, Majuro in the Marshall Islands). Ebeye Atoll, in the Marshall Islands stands out as an entire island which is 100% urban and the most densely populated in the Pacific region. Fiji, the Federated States of Micronesia, Papua New Guinea, Solomon Islands, Tonga and Vanuatu each have distinct urban centres on large islands (Wilkinson, 2011).

6.2 Common challenges for managing urban growth

Rapidly increasing population densities, low government/technical capacities, unplanned settlement growth and complex land tenure systems all contribute to the challenges of managing urban growth and the provision of access to improved drinking-water and sanitation services for urban dwellers of Pacific island countries.

As towns grow, the only land available to accommodate urban expansion is predominately customary-owned land which is statistically reported as rural, thus influencing analysis on responses to changing population distribution and density. Traditional land tenure arrangements present significant challenges for governments to secure areas for new urban development or for new settlers to buy or lease serviced housing plots.

The result has been a rapid growth in informal and squatter settlements, particularly in Melanesian countries, in response to the housing demand. Many of these informal communities are located in hazard vulnerable areas often on the peripheries of urban centres, such as exposed coastlines, mangroves and watersheds, which are often the “flash-points” for the spread of communicable and water-borne diseases.

Both national and local government authorities grapple within institutional frameworks that are not well designed. There is also an absence of a framework for urban infrastructure management and coordination.

Access to basic services (including WASH and education), solid waste management and traffic management often head the list of local government challenges. The Pacific Urban Agenda recognizes the unique challenges faced by Pacific island countries and the particular social and cultural settings within which planning must be approached (UN ESCAP, 2010).

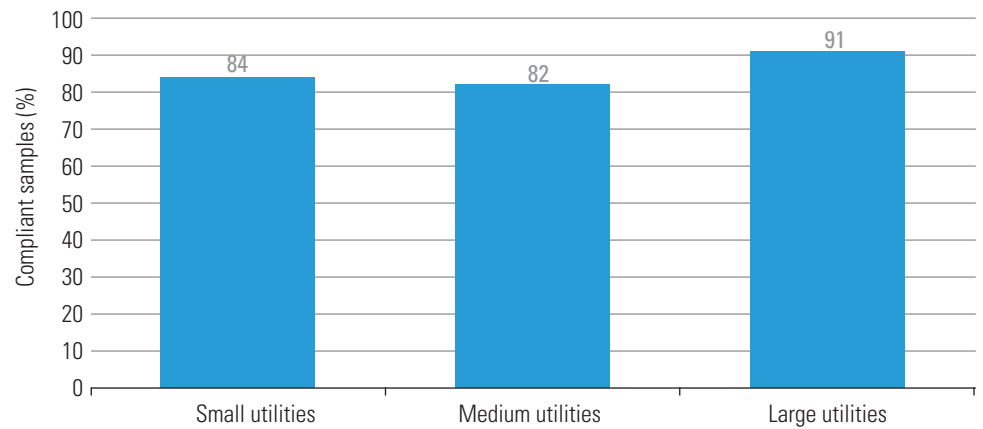
6.3 Urban access to drinking-water and sanitation

While urban coverage is reported as high, this does not account for informal settlements technically classified as rural. According to JMP statistics (UNICEF and WHO, 2015), about 93% of the urban population in Pacific island countries uses improved drinking-water and 67% uses piped water into the household. The “unseen” in these statistics are those who reside in informal or under-served settlements located within urban and peri-urban locations. Peri-urban locations are politically classified as rural and do not contribute to the formal urban statistics. In terms of service provision, these are economically viable communities who, for the most part, are willing to pay affordable and fair rates for access to safe drinking-water.

What also remains hidden under statistics is the safety of water distributed through piped systems. According to PWWA (2012), 14% of the tested samples from (urban-serving) utilities are still non-compliant for microbiological water quality standards (Fig. 47).

Figure 47

Proportion of samples compliant for microbial water quality standards, Pacific Island utilities, 2012



Source: PWWA (2012)

The low efficiency of drinking-water systems in the Pacific region means that non-revenue water in urban centres is more than half the water produced. Limited progress was made in the last decade to improve access to basic sanitation in most major urban centres. About 71% of the region's urban population use improved sanitation facilities with 48% use toilets flushing to conventional sewerage systems. Notable efforts to improve sanitation facilities include Fiji's city-wide settlement-upgrading partnership between national government and NGOs. However, significant improvements are needed in underserved urban communities.

6.4 Urban water and sanitation post-2015

Urbanization can improve livelihoods for urban residents. The World Bank (2010) noted that "there is a need, therefore, to clearly define the relationship between key urban management stakeholders and to better engage urban and peri-urban communities in the development discourse". The 2030 Agenda for Sustainable Development included target 6.3 "By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally" which is crucial for sustainable urban development. SDG 11 deals with "making cities and human settlements inclusive, safe, resilient and sustainable" and SDG target 11.1 is, "by 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums." In rapidly growing Pacific urban areas, achieving this SDG target would require political will, multi-level governance, private investment and territorial coordination and development, and to keep pace with the dynamic nature of urban development.

SECTION 7

Climate and disaster risk

7.1 Mounting pressures

In its Fifth Assessment Report (AR5), the Intergovernmental Panel on Climate Change (IPCC) concluded that there is unequivocal evidence of rising temperatures world-wide (IPCC, 2013 and IPCC, 2014). Since the 1950s, the atmosphere and oceans have warmed, snow and ice have diminished and sea levels have risen. AR5 emphasized changes in the oceans: ocean warming dominates the increase in energy retained at the Earth's surface by the lower atmosphere, accounting for more than 90% of the solar energy accumulated from 1971 to 2010. This, and the accelerating melting of landed ice-sheets and glaciers, has increased the average annual rate of sea-level rise over several decades. In the Pacific region, virtually all human settlement is coastal and exposed directly to storm activity, sea-level rise and changes in marine ecosystems.

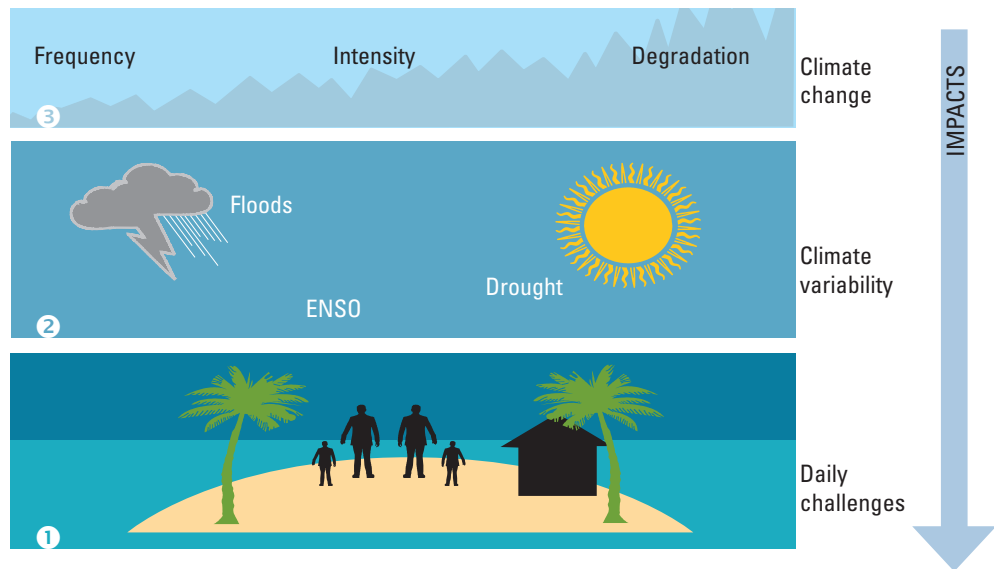
The IPCC predicts that the rise in average global surface temperature by the end of the 21st century, relative to 1850–1900, will exceed 1.5°C; patterns of energy use and GHG emissions may lead to warming of 3–4°C. Warming will not proceed uniformly; there will be variability between years, decades, and geographic regions.

In the Pacific region, water is the primary medium through which climate variability, climate change and natural hazards influence livelihoods and wellbeing. Better management of water and sanitation is key to effective adaptation responses.

Pacific island countries will need to manage issues related to population growth, limited and ephemeral water resources, incomplete and eroding infrastructure, limited institutional capacity, thinly spread human resources and inadequate and irregular funding sources. The uncertainty and extremes of climate variability and natural hazards compound and exacerbate these management challenges. These impacts are mounting pressures on Pacific island countries seeking safe and sustainable water and sanitation for their populations.

Figure 48

The mounting pressures of climate change and climate variability on the day-to-day water and sanitation challenges faced by Pacific island countries



Water – Security – Health – Sanitation – Sustainability – Pollution – Infrastructure
Information – Governance – Capacity – Finance

Source: based on SPC, 2011

Most Pacific island countries remain largely unprepared for the floods and droughts that are an ongoing feature of the region. The serious and emerging impacts of climate change add a new dimension to the problem: threatening resources; increasing uncertainties; and intensifying the extremes of climate variability.

Across the Pacific region, the impacts of climate change are predicted to vary widely but are expected to affect all aspects of the hydrological cycle. Some subregions are likely to become wetter and some drier, while all are expected to experience an increase in rainfall intensity and seasonal variability (IPCC, 2007). An increase in average temperatures occurred throughout the region during the second half of the 20th century, accompanied by a trend towards more frequent hot days and nights and fewer cool days and nights. Changes in rainfall over recent decades are more varied. Some areas have experienced increased rainfall. In other areas rainfall has decreased. However, these recent regional trends are small compared to the year-to-year variability associated with El Niño-Southern Oscillation (ENSO) events (SPC, 2011).

Recent sea-level changes have also varied across the region, being strongly influenced by ENSO patterns. Globally, satellite data indicate the average sea level has risen at a rate of about 3.2 mm/year since 1993. The IPCC projects a rise of 18–80 cm by 2100, and potentially more, with the most significant impacts likely to occur in the latter half of the 21st century.

Much work is needed to translate global climate change projections to local impacts, and improve the collection and use of observational records. These are crucial steps to understanding the nature and impacts of climate change on individual Pacific island

countries. However, it is likely the key climate challenges facing Pacific communities will be driven by (SPC, 2011):

- **climate variability:** through variations in the ENSO pattern and in seasonality of annual rainfall;
- **climate extremes:** particularly through storms and ENSO-driven drought;
- **temperature rise:** impacting biodiversity, water resources and crop yields; and
- **sea-level rise:** contributing to the salinization of water resources and an amplification of the impacts of storm surges.

Pacific island countries are among the most vulnerable in the world to natural hazards. These hazards can result in disasters that affect economic, human, and physical environments and severely affect long-term national development agendas. Since 1950, natural disasters have directly affected more than 3.4 million people and led to more than 1700 reported deaths in the Pacific region. The consequences of natural disasters are especially dire for those with low socioeconomic status who often live in higher-risk areas, and typically have fewer options in terms of protection or risk mitigation. Population pressure, compounded by the effects of climate change, is likely to increase this vulnerability (World Bank, 2013). Box 8 describes a risk-mapping approach for water and sanitation in Solomon Islands.

BOX 8. Child-centred risk mapping for WASH in Solomon Islands

Pacific island countries are exposed to geophysical and weather-related hazards, including earthquakes, tsunamis, tropical cyclones, floods, drought and landslides. Solomon Islands has high relative disaster risk because almost all its population and assets are exposed to natural hazards while the economy is concentrated in a few climate-vulnerable sectors.

Many resources have gone into understanding risk from hazards and climate change in Pacific island countries, resulting in a high-quality regional information base. Disaster risk modelling and assessment tools for the Pacific island countries were developed in 2011 through the Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI), a joint initiative of SPC, World Bank, Asian Development Bank, Japan, and the Global Fund for Disaster Risk Reduction. PCRAFI produced high-resolution disaster risk maps for each country based on hazard assessments of earthquakes and tropical cyclones. The Pacific Climate Change Science Program (PCCSP), funded by AusAID from 2009 to 2011, was a partnership between the Australian Bureau of Meteorology and Commonwealth Scientific and Industrial Research Organisation. The PCCSP provided regional and national analysis of current and potential future conditions against indicators such as sea-level rise, rainfall, extreme weather events and ocean acidification.

Despite the wealth of risk information available nationally, many governments and organizations still find it challenging to move to risk-informed planning and programming. In the case of UNICEF, more analysis was needed to understand where the impact of disasters on children is the highest in order to adjust their geographic and strategic focus for more equitable, effective, and sustainable programming. With regard to water and sanitation, a better information base was required to inform decisions to improve policy, planning and coordination.

Risk mapping can support risk reduction by showing where decreasing vulnerability and exposure, or increasing capacity will have the biggest impact. WASH sector partners can decrease vulnerability by investing in sustainable WASH infrastructure, and assuring quality standards and regular monitoring. Governments can decrease exposure by engaging in improved

catchment management and better locating infrastructure away from hazards. Similarly, governments can increase capacity by ensuring WASH preparedness at the national, provincial and community levels. National WASH clusters with good coordination, sound national and provincial preparedness plans, and adequate contingency stock are another way to reduce risk. Countries can also build community resilience through institutionalizing WSPs and strengthening WASH committees.

Source: UNICEF Fiji

7.2 The role of water and sanitation

The region's response to climate and disaster risk must address the underlying challenges for water and sanitation. By strengthening the capacity of Pacific communities to better deal with these challenges, adaptation strategies can improve responses to climate variability, natural hazards and the impacts of climate change.

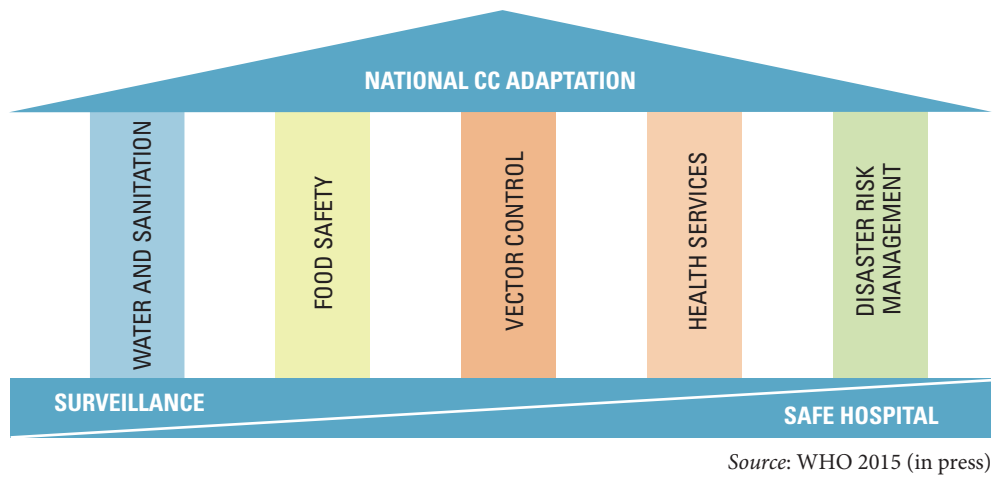
Pacific island countries acknowledge the critical importance of water and sanitation in disaster response, as demonstrated in recent disasters such as tropical cyclone Pam in Kiribati, Solomon Islands, Tuvalu and Vanuatu and super typhoon Maysak in the Federated States of Micronesia in 2015. However, countries also recognize that more needs to be done to move from a paradigm of disaster response to one of hazard assessment and risk management (Pacific RAP, 2003). In this regard, the role of the water and sanitation sector is crucial.

Dialogue between the region's water and disaster managers has confirmed the critical role of the water and sanitation sector in assisting countries to assess, manage and adapt to the impacts of climate variability, climate change and natural hazards. Managing the water-related impacts of natural disasters, climate variability and climate change requires a risk-based approach, and integration of effective risk-reduction strategies across all sectors.

Dedicated efforts are needed to ensure water and sanitation is reflected in national climate change adaptation plans. Together with food safety, vector control, health services and disaster risk management, water and sanitation is a pillar of climate-resilient health systems supporting national climate change adaptation (Fig. 49).

Figure 49

A climate-resilient health system in national climate change adaptation



BOX 9. Emergency preparedness and response through national WASH Cluster arrangements in Fiji

Fiji's population of nearly 900 000 is scattered across 333 islands. The statutory Water Authority of Fiji (WAF) oversees all reticulated water in towns and cities and the Water and Sewerage Department administers the Rural Water and Sanitation Policy to support drinking-water access in rural areas. A sector reform process and increased investments over the past 10 years, along with several nongovernmental organizations to support the WASH capacity of rural communities, have led to investments in water and sanitation infrastructure, establishment of village water committees and water supply management plans.

With increasing urbanization, informal settlements in flood plains and densely populated coastal areas, the proportion of Fiji's population affected by emergencies caused by flooding and cyclones is increasing, as is the frequency and severity of these natural hazards. Stakeholders must incorporate disaster risk resilience and climate change adaptation in all WASH activities. Preparedness is a priority, including building capacity to deal with disasters, providing safe and sustainable water supply and sanitation systems and effective hygiene promotion.

Modelled after global best practice, the cluster approach for humanitarian response in emergencies was endorsed by the Government of Fiji following Cyclone Evan in 2012. The cluster ensures better coordination of partner efforts to deliver WASH interventions during disasters and emergencies. The objectives of the WASH cluster are:

- Better response and preparedness to ensure a quicker return to normalcy and prevent the spread of WASH diseases, while preparedness increases the capacity of communities and individuals to withstand changes in climate and disasters.
- Better coordination of WASH activities in Fiji to ensure all communities benefit from international and local resources provided. Identifying those communities in most need and aligning activities to increase their capacity for resilience.
- Strengthen cooperation between WASH agencies to ensure resources and information sharing to best implement projects and activities for more efficient actions.
- Introduce drinking-water safety planning to address risk resilience and water security. This includes disseminating information on RWSP and the WSMP to WASH stakeholders and convening dialogue on how best to improve policies and regulations.

Source: Fiji Ministry of Health and Medical Services, UNICEF

7.3 Impact of climate change on water and sanitation

The Pacific SIDS are particularly vulnerable to environmental natural hazards such as tropical cyclones, typhoons and earthquakes turning into disasters. One major tsunami or tropical cyclone can destroy years of development effort.

Water resources in the Pacific region are extremely vulnerable to changes and variations in climate because of their limited size, availability and geology and topography, especially in rainfall. An increase of 2–4°C is estimated to result in economic losses amounting to US\$ 1 billion in damages to water resources. Water stresses caused by climate change will affect rural communities with low socioeconomic status reliant on water resources for their livelihoods. Major impacts are related to changes in temperature, rainfall and sea-level rise including accelerated coastal erosion, saline intrusion into freshwater lenses and increased flooding from the sea which cause serious harm to human settlements. Less rainfall coupled with accelerated sea-level rise would compound this threat. Lower rainfall typically leads to a reduction in the amount of water that can be harvested and river flow, and to a slower rate of recharge of the freshwater lens, which can result in prolonged drought impacts (UNCCD, IFAD, 2013). Box 10 provides an example of climate adaptation and resilience in Tuvalu.

BOX 10. Sanitation solutions building climate resilience in Tuvalu

The atoll nation of Tuvalu has demonstrated that innovative sanitation solutions can contribute significantly to climate change adaptation efforts.

The successful implementation of “eco-sanitation” in the capital Funafuti has demonstrated significant reductions in sewage pollution to groundwater and coastal waters, reduction in the use of fresh water for toilet flushing, and the generation of organic matter in a country devoid of agriculturally productive soils. Each household that adopted this innovative waterless solution has eliminated their sewage load to groundwater and reduced their use of fresh water by approximately 30% - equivalent to eight to ten 10 000 litre rainwater tanks per household per year.

Social and design lessons learnt from this demonstration have made eco-sanitation a key part of Tuvalu’s response to climate change. Tuvalu is now a centre of regional expertise on eco-sanitation, and in the Pacific way has been active in sharing its findings with other atoll countries struggling with the pollution impacts and water demand associated with flush toilets.

Source: SPC (2014)

SECTION 8

Integrated Water Resources Management

There is a growing recognition globally of the role of integrated water resources management (IWRM) in enabling communities to achieve and maintain safe and sustainable drinking-water and sanitation. The Global Water Partnership has defined IWRM as “a process which promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems” (GWP, 2000). The concept of IWRM recognizes that water is everybody’s business, from ridge to reef and from community to cabinet and that the collaboration of all stakeholders is required to achieve sustainable management of land and water resources.

SDG 6 includes targets 6.4 to 6.6 which address issues such as the increase of water-use efficiency; sustainable withdrawals and supply of freshwater; water scarcity; implementation of integrated water resources management; and to protect and restore water-related ecosystems.

Water connects and links many sectors and interest groups. It is therefore important that national development planning involves and coordinates all these sectors and groups to avoid duplication of effort and to ensure that all aspects of water and sanitation management are covered in a cost-effective manner. This can be facilitated by IWRM planning processes, where representatives from various sectors and stakeholder groups can together progress plans, strategies, policies and legislation to enable more effective management of water resources, drinking-water supplies, and sanitation facilities.

Common strategies and planning can help governments to better coordinate institutions and external contributions and collaboration with nongovernmental organizations and other stakeholders (SPC, 2007).

The IWRM approach aims to (SPC, 2007):

- Take into account the links between water and the environment, communities and industries, to manage it as part of a larger water cycle that moves from raindrop to ocean;
- Balance different water demands for human health, the environment and economic development by allocating water in a fair way that prevents conflict between different users and takes into account the needs of all members of society;

- Recognise that water is a finite resource and ensure that it is used in an efficient and sustainable way to provide the greatest possible benefit to as many people as possible both now and in the future;
- Bring together government and stakeholders from different sectors and interest groups, to plan and manage water in a coordinated and strategic way that links national and local management efforts.

IWRM approaches have been successful in tackling some of the region's most difficult water and sanitation challenges. Since 2009, the Pacific IWRM programme has supported 13 countries to reduce stress on vulnerable freshwater and coastal resources, strengthen the national coordination of water and sanitation, and reform national water and sanitation policy and planning.

Knowledge sharing between countries has resulted in an active regional IWRM network that has potential to progress innovative solutions to the region's water and sanitation challenges. Additional information on Pacific island countries' experience in implementing IWRM approaches can be found at the website: pacific-iwrm.org. Box 11 provides a sound example of subregional cooperation and collaboration in IWRM.

BOX 11. A Micronesian approach to IWRM

In 2011, the Marshall Islands, the Federated States of Micronesia and Palau agreed to develop a collaborative, sub-regional solution to address fragmented water and sanitation efforts. The idea was that national water summits would facilitate the discussion of water and sanitation needs and would serve to benchmark the state of water and sanitation management, identify policy gaps, and be a first step towards developing national water policies in each of the three countries.

The nations agreed to each hold National Water Summits on World Water Day to discuss priority issues, and possible solutions and policies. Summit participants included traditional leaders, community representatives, civil society and government representatives. The National Water Summits engaged leaders at the highest level, and secured commitments to the development of solid policy platforms and investment plans for water and sanitation.

The successful sub-regional approach is continuing beyond the national summits, with a Micronesian Water Committee established as a permanent working group of the Micronesian Chief Executives Summit (MCES). With the support of the Pacific IWRM programme, MCES established Micronesia's "Water for Life Campaign", including the "Pacific Blue Water Ribbon" and "Blue Ribbon Day" to be celebrated each world water day.

The sub-regional approach along with country specific programmes for the North Pacific has been very successful in mobilizing IWRM solutions through a process that sustains country motivation and enthusiasm in an atmosphere of Micronesian camaraderie and achievement at all levels, from "Community to Cabinet".

Source: SPC (unpublished)

SECTION 9

Conclusions

While all Pacific island countries have made some progress in water and sanitation, many of these efforts are not keeping up with population growth. The sheer magnitude of the task at hand requires renewed efforts and reenergised partnerships to help secure our region's water and sanitation future."

Dr Colin Tukuitonga, Director General of the Pacific Community, at the Third International Conference on Small Island Developing States, Apia, Samoa, 4 September 2014.

9.1 The Human Rights to safe drinking-water and adequate sanitation

In 2010, the General Assembly of the United Nations recognized "the right to safe and clean drinking-water and sanitation as a human right that is essential for the full enjoyment of life and all human rights" (Resolution A/RES/64/292). The resolution also "calls upon States and international organisations to provide financial resources, help capacity-building and technology transfer to help countries, in particular developing countries, to provide safe, clean, accessible and affordable drinking-water and sanitation for all".

Following this decision, in 2010 the Human Rights Council unanimously adopted a resolution (A/HRC/15/L.14) affirming that "the rights to water and sanitation are part of existing international law and confirms that these rights are legally binding upon States". The resolution also calls upon countries to develop appropriate tools and mechanisms to ensure access to safe drinking-water and sanitation, including in unserved and underserved areas.

These resolutions are a major achievement, as all UN Member States now affirm the right to water and sanitation under international law. The United Nations human rights system will be used to monitor progress in realizing the right to water and sanitation.

Formally acknowledging water and sanitation as a human right is a major commitment towards achieving universal access.

9.2 Targets of the 2030 Agenda for Sustainable Development

The Pacific region's MDG sanitation target of 65% of 2015 has not been reached. Regional sanitation coverage is only 31% in 2015. Similarly, the Pacific region (at 53%) has not reached the MDG drinking-water target of 73%. Considered individually, most countries achieved the MDG drinking-water target.

Meaningful progress towards the 2030 Agenda for Sustainable Development targets of universal access to drinking-water, sanitation and hygiene will require a fundamental recalibration of efforts by Pacific island countries and development partners. Achieving such targets will require that the commitments made by Pacific island countries from 1990 to 2015 be converted into serious and sufficient investments beyond 2015.

9.3 The road ahead

Some countries have made commendable progress towards extending sanitation and drinking-water services to their citizens, and towards meeting the MDG water and sanitation targets. Other governments, however, still struggle to fulfil their commitment to basic service provision.

The general lack of development of the water and sanitation sector in the Pacific region can be attributed to complex water governance and a lack of prioritization of sector investments. Water governance is highly complex due to the specific socio-political and cultural structures of traditional community, tribal and inter-island practices, rights and interests. Sector policies and approaches have generally been fragmented and often lacked ownership. Competing priorities have often won out over investments in drinking-water and sanitation, though this appears to be changing.

Pacific island countries recognize the constraints on water and sanitation sector development and are committed to sustainable management. The recommendations made in the *Pacific Regional Action Plan on Sustainable Water Management* (RAP) remain valid, and provide a useful framework towards post-2015 targets (SOPAC & ADB, 2003). The RAP includes key messages, supporting elements, actions required and responsible parties. The key messages, in the form of recommendations, organized around six main themes are shown in Annexes 3 and 4.

BOX 12. Building better governance in Nauru

for freshwater and pollution threats to the groundwater supply. Added to this is Nauru's reliance on ageing infrastructure and energy-intensive desalination, the challenge of securing sustainable funding sources, and coping with the projected impacts of climate change. These are all issues that the Government of Nauru hopes to overcome through applying an integrated approach to managing its scarce water resources. The endorsement of Nauru's first National Water and Sanitation Policy is sound basis to move forward.

Haseldon Buraman, Nauru's National IWRM Coordinator, was instrumental in the development of the policy, and in the subsequent drafting of an implementation plan to turn the policy into action. "The scale of the problem and the issues we need to deal with go beyond traditional infrastructure interventions. Developing the policy has shown that we need to improve governance, capacity and community participation and ensure that water and sanitation issues are tackled by all of government not just the agencies traditionally associated with water resources management," Mr Buraman said. "The fact that we have formed a whole-of-government Water Technical Committee is testament to just how seriously we in Nauru take this problem."

Nauru's policy addresses 38 priority issues over the next 15 years, covering seven key themes: climate variability and change and water resource vulnerability; water quality and supply; sanitation and environment; demand; governance; capacity; and community awareness and participation. A range of short-, medium- and long-term activities have been selected. The agencies responsible for carrying out these activities have been identified, along with time lines for completion.

Nauru's water and sanitation challenges remain significant, but Nauru's response to these challenges will ensure combined efforts are targeted to achieve outcomes sought by all.

Source: SPC (2014)

The status of Pacific island countries with regard to water, sanitation and health shows:

- Water security is a critical sustainable development issue for Pacific island countries, with profound implications for livelihoods, economic growth, public health, the environment and human rights.
- While all Pacific island countries are improving access to safe water and sanitation, these efforts are often not keeping pace with population growth. As a result, the Pacific region has made very poor progress in meeting the MDG drinking-water and sanitation target.
- The 2030 Agenda for Sustainable Development includes targets for universal equitable access to safe and affordable drinking-water, adequate and equitable sanitation and hygiene for all and end open defecation. Making meaningful progress towards these goals will require a fundamental recalibration of efforts by Pacific island countries and development partners, particularly in light of projected population increases.

The challenges in Pacific island countries vary from other countries in important ways, and these differences need to be considered when discussing how Pacific SIDS might progress towards SDGs drinking-water and sanitation targets.

In particular, the following factors are critical:

1. The challenge of ensuring drinking-water quality

The quality of drinking-water has an important impact on health. Poor-quality water may cause disease outbreaks and can contribute to high rates of child morbidity and mortality. Sound measures should ensure that water safety leads to public health and socioeconomic development.

In the Pacific region, although several countries have achieved high levels of coverage with improved drinking-water sources, there is little information about the quality and safety of the water delivered to the population. A crucial aspect of efforts towards water sector development is the preparation and implementation of drinking-water safety plans (DWSPs). Several Pacific island countries have developed and implemented DWSPs, for urban water supplies and rural and community-managed schemes. Thus, ensuring better quality drinking-water requires the enhancement of actions to promote, implement and monitor DWSPs in the region.

Promoting and implementing DWSPs will ensure that health benefits accrue from the efforts to achieve universal drinking-water coverage in Pacific island countries.

2. Protecting limited and fragile water resources

For many Pacific communities, the availability of freshwater resources is confined to small and fragile groundwater lenses, streams and/or rainwater collected from roofs. These scarce resources are vulnerable to overexploitation and contamination, particularly in atoll environments, where limited potable groundwater sources can be threatened by over-pumping, land use activities, and inappropriate sanitation facilities. Efforts to achieve SDGs water and sanitation targets in the Pacific must consider the water cycle as a whole, and use IWRM approaches from “ridge to reef” to protect the sustainability of fresh water resources (measures include water demand management, watershed management and pollution control).

Water and sanitation solutions need to be sustainable, safe and not adversely impact limited and fragile water resources (noting that this may add to the cost of these solutions).

3. Supporting small, isolated and informal communities

Pacific island countries are home to growing communities with minimal access to government and private-sector services. For these communities drinking-water, sanitation and hygiene are primarily managed at the household, village or settlement level. These communities face significant disparities in access to safe water and sanitation, and are expected to experience relatively high population growth rates. To meet SDGs water and sanitation targets, significant support will be required to better equip small communities to establish, operate and maintain appropriate water and sanitation facilities, while also maintaining safe drinking-water and hygiene practices in homes, schools and health facilities.

More needs to be done to empower small, isolated and informal communities to safely and sustainably manage their own drinking-water, sanitation and hygiene.

4. Coping with limited human and financial resources

A significant acceleration of efforts is required to meet SDGs water and sanitation targets. Pacific island countries are generally constrained by small economies, relatively high costs of materials and services, and serious challenges in building and retaining human resources. Meaningful progress towards SDGs water and sanitation targets will require a programmatic approach to strengthen and maintain capacity at local, national and regional levels. This requires a recalibration of government priorities and investments, along with increased development partner cooperation, for the additional infrastructure, services and planning needed to cater for the projected increases in urban and rural populations.

Significant increases in cooperation are required to strengthen the capacity of Pacific governments, utilities and communities to provide and manage sustainable water and sanitation services in the face of human and financial resource constraints.

5. Increasing resilience to climate variability, climate change and natural hazards

Pacific island countries are particularly vulnerable to the impacts of climate variability and change, and are subject to a relatively high frequency of natural hazards such as cyclones, floods and drought. Achieving water security through varying climatic conditions, natural hazards and climate change requires the use of all available water sources, including rainwater, groundwater, surface water, and in some cases desalinated supply. The resilience of Pacific communities relies on maintaining the sustainability of a variety of water sources in the face of ongoing climate and disaster challenges.

Safe and sustainable water and sanitation solutions are vital to strengthening and maintaining the resilience of Pacific communities to the increasing threats of climate variability, climate change and natural hazards.

Each of the above considerations will be important in determining Pacific island countries approaches to meeting the SDGs for water and sanitation and will likely result in additional logistical and cost burdens unique to the region, requiring significant and sustained national and partner cooperation.

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Annex 2

Country and regional estimates of improved drinking-water coverage in Pacific island countries

Country	Year	Urban population (thousands)	Rural population (thousands)	Total (%)				Urban (%)				Rural (%)				Change in proportion of population that gained access to improved drinking-water into the household from 1990 to 2015 (% points)	Change in proportion of population that gained access to improved drinking-water from 1990 to 2015 (% points)
				Improved		Unimproved		Improved		Unimproved		Improved		Unimproved			
				Total improved	Piped onto household	Unimproved	Surface water	Total improved	Piped onto household	Unimproved	Surface water	Total improved	Piped onto household	Unimproved	Surface water		
Cook Islands	1990	10	7	100	0	0	0	100	0	0	0	0	0	0	0	0	NA
	2000	12	6	100	0	0	0	100	0	0	0	0	0	0	0	0	NA
	2015	16	5	100	0	0	0	100	0	0	0	0	0	0	0	0	NA
Fiji	1990	303	425	86	57	3	94	92	6	80	32	15	5	5	10	11	11
	2000	389	423	91	63	7	2	97	85	34	11	4	4	4	17	9	9
	2015	480	412	96	68	2	2	100	91	36	5	4	4	4	17	9	9
Kiribati	1990	25	46	50	26	74	43	43	36	16	16	16	16	16	17	9	9
	2000	36	47	59	31	80	54	43	36	16	16	16	16	16	17	9	9
	2015	47	59	67	35	87	67	51	94	0	0	0	0	0	3	0	0
Marshall Islands	1990	31	17	92	3	94	4	92	0	0	0	0	0	0	3	0	0
	2000	36	16	93	3	94	4	92	0	0	0	0	0	0	3	0	0
	2015	43	16	95	3	94	4	92	0	0	0	0	0	0	3	0	0
Micronesia, Federated States of	1990	25	71	91	2	7	94	3	3	90	2	8	8	8	NA	NA	NA
	2000	24	83	90	3	7	94	3	3	89	3	8	8	8	NA	NA	NA
	2015	24	80	89	37	7	95	42	2	3	87	36	5	8	NA	NA	NA
Nauru	1990	9	0	93	0	0	0	93	0	0	0	0	0	0	NA	NA	NA
	2000	10	0	97	0	0	0	97	0	0	0	0	0	0	NA	NA	NA
	2015	11	0	97	68	97	68	99	98	98	98	98	98	98	NA	NA	NA
Niue	1990	1	2	99	98	99	98	99	99	98	98	98	98	98	-1	-1	-1
	2000	1	1	99	98	99	98	98	99	98	98	98	98	98	NA	NA	NA
	2015	1	1	99	98	98	98	98	98	98	98	98	98	98	NA	NA	NA
Palau	1990	11	5	90	90	98	98	97	97	80	80	80	80	80	NA	NA	NA
	2000	13	6	92	92	97	97	97	97	80	80	80	80	80	NA	NA	NA
	2015	19	3	97	97	97	97	97	97	84	84	84	84	84	NA	NA	NA
Papua New Guinea	1990	623	3534	34	12	23	43	87	61	7	6	27	49	49	6	-3	-3
	2000	710	4669	35	11	22	43	88	59	7	5	27	3	24	6	-3	-3
	2015	976	6656	40	9	18	42	88	55	9	3	33	3	19	6	-3	-3
Samoa	1990	35	128	89	74	11	0	97	82	3	0	87	13	13	0	11	11
	2000	38	136	93	80	7	0	97	87	3	0	92	8	8	0	10	10
	2015	37	156	99	85	0	1	97	91	2	1	99	84	0	1	11	11
Solomon Islands	1990	43	280	65	23	13	7	93	61	6	1	77	16	14	9	NA	NA
	2000	65	347	80	23	12	7	93	61	6	1	77	16	14	9	NA	NA
	2015	130	454	81	26	12	7	93	61	6	1	77	16	14	9	NA	NA
Tonga	1990	22	74	89	89	97	97	97	97	97	97	97	97	97	1	NA	NA
	2000	23	75	99	99	97	97	97	97	97	97	97	97	97	1	NA	NA
	2015	25	81	100	78	100	73	100	80	80	80	80	80	80	1	NA	NA
Tuvalu	1990	4	5	90	90	92	92	92	92	95	95	95	95	95	8	7	7
	2000	4	5	94	94	97	97	97	97	97	97	97	97	97	8	7	7
	2015	5	5	98	97	98	97	98	97	97	97	97	97	97	8	7	7
Vanuatu	1990	27	119	62	18	31	7	94	49	6	0	55	11	37	8	17	17
	2000	40	145	76	25	17	7	96	54	4	0	70	17	22	8	17	17
	2015	69	195	94	35	1	5	99	61	1	0	93	25	0	7	17	17
Region	1990	1169	4702	46	21	20	34	90	69	6	4	35	9	23	42	6	-2
	2000	1401	5859	49	20	18	33	91	69	6	3	39	9	21	40	6	-2
	2015	1883	8123	52	20	14	34	93	67	5	2	43	9	17	41	6	-2

Annex 3

Key recommendations from the Pacific Regional Action Plan on sustainable management

Water resources management

- Strengthen the capacity of small island countries to conduct water resources assessment and monitoring as a key component of sustainable water resources management.
- Implement strategies to utilize appropriate methods and technologies for water supply and sanitation systems and approaches for rural and peri-urban communities in small islands.
- Implement strategies to improve the management of water resources, and surface and groundwater catchments (watersheds) for the benefit of all sectors including local communities, development interests, and the environment.

Island vulnerability

- There is a need for capacity development to enhance the application of climate information to cope with climate variability and change.
- Change the paradigm for dealing with Island Vulnerability from disaster response to hazard assessment and risk management, particularly in Integrated Water Resources Management.

Awareness

- A high quality participatory framework should be adopted at the national level to allow for open participation of communities in sustainable water and wastewater management.
- Access to, and availability of information on sustainable water and wastewater management should be provided to all levels of society.
- Water and sanitation education should be mainstreamed into the formal education system.
- Improve communication and coordination of all stakeholders in sustainable water and wastewater management including government, civil society, and the private sector.

Technology

- Appropriate institutions, infrastructure, and information will support sustainable water and wastewater management.
- Utility collaboration and regional partnership to reduce unaccounted-for water will significantly improve the sustainability of utilities and reduce the need for developing new water resources.
- Island specific regional training programmes should be developed, resulting in sustainable levels of skilled and knowledgeable people and communities within the water and wastewater sector.

Institutional arrangements

- Work together through a comprehensive consultative process, encompassing good governance, to develop a shared national vision for managing water resources in a sustainable manner.
- Develop national instruments including national visions, policies, plans, and legislation appropriate to each island country taking into account the particular social, economic, environmental, and cultural needs of the citizens of each country.
- Promote and establish appropriate institutional arrangements resourced sufficiently to enable effective management of water resources and the provision of appropriate water services.
- Recognize and share the water resources management knowledge and skills of all stakeholders at a national and regional level in the process of developing and implementing the national vision.
- National and regional leadership in water resources management should be recognized and encouraged.

Finance

- Create a better and sustainable environment for investment by both the public and private sector, by developing and implementing national, sector, and strategic plans that identify the economic, environmental, and social costs of different services and develop pricing policies, which ensure the proper allocation of resources for the water sector.
- Establish financially-viable enterprises for water and sanitation that result in improved performance by developing appropriate financial and cost-recovery policies, tariffs, billing and collection systems, and financial and operating systems.
- Reduce costs through improved operational efficiency, using benchmarking, development of water-loss reduction programmes, and improved work practices.
- Ensure access for the poor to water and sanitation services by developing pro-poor policies that include tariffs with lifeline blocks and transparent and targeted subsidies.
- Achieve sustainable rural water and sanitation services at the community level through developing strategies that incorporate mechanisms for appropriate financing and capacity building.

Source: SOPAC & ADB (2003)

Annex 4

The Chiang Mai Declaration

The Chiang Mai Declaration is the final outcome from the Second Asia-Pacific Water Summit that took place in Chiang Mai, Thailand, on 19–20 May 2013. It calls on Heads of State, Governments and high-level representatives to:

- Renew the commitment made at the First Asia-Pacific Water Summit (Beppu, Japan, 2007), to accord high priority to water and sanitation in national agendas and to allocate resources to water and sanitation sectors;
- Encourage the inclusion of disaster risk reduction in the United Nations development agenda beyond 2015 to address the common challenges to reduce deaths and economic losses from floods, droughts and other natural disasters;
- Accelerate the progress of incorporating integrated water resources planning and management, as appropriate, in the framework of the national socio-economic development planning process while supporting the best practices and traditional treatment of water resources;
- Enhance regional and international cooperation on sharing, exchange and dissemination of scientific and technical knowledge, as well as best practices, related to integrated water resources management;
- Promote efficient use of water resources while taking into account basic human needs including domestic, industrial and agriculture water uses and balancing preservation of ecosystems;
- Improve irrigation systems in agricultural sector which consume a huge volume of water resources as a part of the plans to promote water use efficiency;
- Increase transfer of technology, enhance capacity building and knowledge sharing to optimize manifold use of water and minimize adverse impacts from water-related risks and disasters on people's livelihood, economy and environment;
- Accord priority to effective use of information and communication technology towards development of water-related disaster risk reduction and relief systems, including for early warning, and build resilient communities through capacity development, responsive governance, and innovative sources of finance;
- Encourage the adoption of policies and measures to reduce water pollution, combat desertification, improve water quality and protect wetlands, rivers and the other source of fresh water which are among the basic needs of human being and nature;

- Further encourage better networking and partnerships, where appropriate, between governments and other stakeholders, on activities related to the management, protection and rational utilization of water resources, including through strengthened public-private partnership;
- Encourage appropriate consideration of water issues in the discussion of the United Nations development agenda beyond 2015;
- Invite the Asia-Pacific Water Forum to mobilize initiatives in support of all these recommendations, and to encourage consideration, as appropriate, of green economy policies in the context of sustainable development and poverty eradication, as well as the establishment of the Asian Water Information System;
- Encourage all governments to make all efforts to implement these recommendations with a will and courage to realize our vision.

Source: APWS (2013)

Annex 5

Working together to improve sanitation and drinking-water in Pacific island countries

World Health Organization (WHO)

The WHO Representative Office in the South Pacific in Suva, Fiji, operates under the WHO Regional Office for the Western Pacific, acting as a catalyst and advocate for action at all levels, from local to global, on health issues of public concern. WHO works together with a broad spectrum of partners from all sectors of society, WHO is involved in a host of closely related public health activities; including research, evaluation, awareness raising and resource mobilization.

The WHO Representative Office in the South Pacific leads the regional response to public health issues on all fronts – medical, technical, socio-economic, cultural, legal and political – towards the achievement of WHO's global health mission which is to support all countries and peoples to achieve the highest attainable level of health. This is defined in the WHO Constitution as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."

With regard to water, sanitation and hygiene, the WHO Representative Office in the South Pacific focuses on:

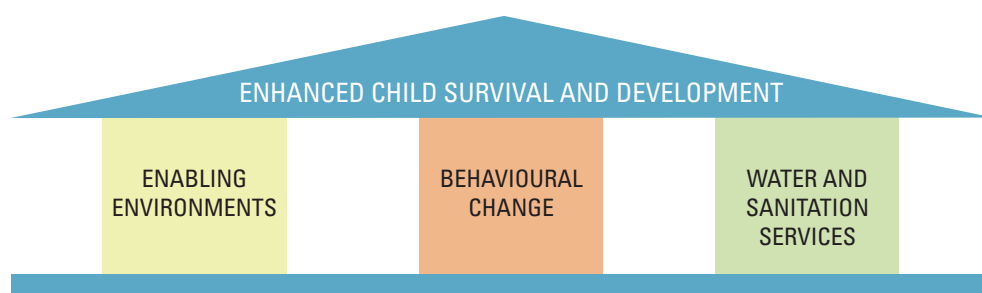
- Promotion of and advocacy for access to drinking-water and sanitation services: the main focus is to highlight the basic right of all citizens to health protection through access to safe drinking-water, basic sanitation, and good hygiene behaviours.
- Drinking-water quality standards: support to countries in training and preparation of their drinking-water quality standards in light of the WHO Guidelines for Drinking-Water Quality.
- Drinking-Water Safety Plans (DWSPs): support to countries in training, preparation and implementation of DWSPs.
- Household Water Treatment and Safe Storage (HWTS): promotion, training and support to formulation and implementation of HWTS plans at country level.
- National sector information and sector assessments: support countries in establishing national sector assessment processes and preparing national sector assessment reports especially with a view to collect and analyse information within the context of the Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS);
- National sector monitoring: support to the implementation of national information systems aimed at collecting, analysing and disseminating drinking-water and sanitation coverage data according to the JMP methodology;

- Health care waste: guidance and support to countries in managing health care waste. This is crucial to Pacific islands, where aquifers are highly susceptible to contamination by chemicals or micro-organisms from inadequate management of hazardous waste:
- Drinking-water and sanitation in emergencies and disasters: focused mainly on preparedness and prevention, support to drinking-water quality improvement in emergency areas and technical advice during and after emergencies;
- Normative aspects and training: dissemination of WHO norms and guidelines and training in the different drinking-water, sanitation and hygiene areas.

The United Nations Children’s Fund (UNICEF)

UNICEF Pacific’s Programme¹ in water, sanitation and hygiene (WASH) contributes to the rights of children to survival and development through the provision of drinking-water and sanitation services that are complemented by the promotion of improved hygiene behaviour and supported by an enabling national policy environment.

Three pillars for effective and sustainable WASH programmes



The overall objective of the UNICEF Pacific WASH Programme is to provide children and families with equitable and sustainable access to safe drinking-water, improved sanitation and hygiene within communities that are increasingly resilient to the impact of climate change and natural disasters. UNICEF’s Pacific WASH Programme covers 14 countries in the region, but focuses on three countries with high child mortalities and low water and sanitation coverage: Kiribati, Solomon Islands, and Vanuatu. UNICEF supports all countries during emergencies to ensure that access to WASH services that will prevent the death and suffering of children.

The UNICEF Pacific WASH Programme focuses on six inter-related areas:

- Increasing access to drinking-water and sanitation: UNICEF works with Governments and nongovernmental organizations to support the construction of water and sanitation facilities for communities, schools, and health centres in the three priority countries of Kiribati, Solomon Islands, and Vanuatu.
- Community approaches to total sanitation: In collaboration with all sector partners, UNICEF supports communities to achieve total sanitation coverage and eliminate open defecation

1. UNICEF sector strategies are based on the UNICEF WASH Strategy Paper approved by the UNICEF Executive Board in 2006.

in the three priority countries. UNICEF programmes use Community Led Total Sanitation (CLTS) and Participatory Hygiene and Sanitation Transformation (PHAST) methods to triggered demand for sanitation and achieve behaviour change in priority countries. A framework for up-scaling rural sanitation is being developed that considers sanitation technology options and the enabling environment of sanitation-related legislation and policy.

- WASH sector policy, institutional capacity and donor coordination: In priority countries, UNICEF supports the development of WASH sector policies and strategies, and their implementation. These include the development of the Solomon Islands Rural WASH Policy, implementation of the Vanuatu National Water Strategy, and implementation of the Kiribati Sanitation Policy.
- WASH in schools: UNICEF supports the construction of WASH facilities in schools in Fiji, Kiribati and Solomon Islands, and supported the development of minimum standards for WASH in schools.
- WASH emergency preparedness and response: UNICEF has supported the establishment and development of national WASH Clusters in Fiji, Marshall Islands, Solomon Islands, and Vanuatu. During emergencies, UNICEF provided WASH assistance for the emergency responses to Fiji, Marshall Islands, Tonga, Solomon Islands, and Vanuatu. UNICEF is the Cluster Lead Agency for the Pacific WASH Cluster, coordinated through the Pacific Humanitarian Team, and facilitates exchange of lessons learnt on preparedness and response through SPC.
- Water, climate and disaster risk resilience: UNICEF programmes assist governments and communities to build resilience to hazards and climate variability through better information, improved planning, and smarter investments. UNICEF supports data analysis to inform planning and decision making, such as through spatial child-centered risk assessments², and community-level planning such as drinking-water safety and security plans.

Besides regular UNICEF resources and emergency financing programme funding is made available through the European Union, New Zealand Aid Programme, and the United Nations Trust Fund for Human Security.

The Pacific Community

The Pacific Community (SPC) is a regional organization assisting Pacific island countries to achieve their development goals by delivering technical, scientific, research, policy and training services. SPC is owned and governed by the 26 members of the Pacific Community, which include 22 Pacific island countries and territories. Services delivered by SPC include building and supplementing capacity, and on occasion providing complete services in areas where a member country has no capacity of its own. The SPC Water and Sanitation Programme works across the region to assist member countries to: monitor, assess and manage their fresh water resources; improve access to safe drinking-water and sanitation facilities; and better manage vulnerability and risks.

The regional programme Coping with climate change in the Pacific Island Region (CCCP-IR) is implemented jointly by SPC and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH³ in partnership with the Secretariat of the Pacific Regional Environment

2. UNICEF EAPRO (2013) Child-centered risk assessment. Regional Synthesis of UNICEF Assessments in Asia.
3. GIZ is a German federally owned agency that implements technical cooperation projects on behalf of the German Government and other donors

Programme (SPREP) in 12 Pacific island countries.⁴ CCCPIR aims to strengthen the capacities of Pacific member countries and regional organisations to cope with the impacts of climate change. Changing rainfall patterns, longer drought periods, increased cyclone intensity and rising sea levels are likely to affect all communities and key economic sectors such as agriculture, forestry, fisheries and tourism. Addressing climate change is therefore an urgent priority in the Pacific and countries have consistently highlighted their needs at regional and international fora. The programme is funded through the German Federal Ministry for Economic Cooperation and Development (BMZ) with additional funds from USAID.

The United Nations Habitat (UN-Habitat)

UN-Habitat is mandated to promote socially and environmentally sustainable communities, towns and cities with the goal of providing adequate shelter for all.

By working at all levels and with stakeholders and partners, UN-Habitat builds the capacity of local governments and national partners to better manage urban development, linking city and national policy frameworks to promote cohesive and mutually reinforcing social, economic and environmental development programmes in human settlements in conformity with international practices and covenants.

As the technical agency for managing urbanization and city development, UN-Habitat has access to global and regional experience in the sustainable development of towns and cities such as toolkits, guidelines and processes that can be customized to the Pacific setting in the context of improving access to safe water and helping provide adequate sanitation to millions of low-income urban dwellers (MDG Goal 7 C/D).

UN-Habitat strengthened its engagement in the Pacific from the early 2000s to better support countries to achieve their commitments under the Pacific Urban Agenda through targeted capacity development and institutional building projects and programmes.

UN Habitat's water and sanitation programme goals include the promotion of the human settlement dimension in the World Water Development Reports; enhance awareness of water and sanitation issues (particularly for informal and squatter communities); form strategic partnerships among key water and sanitation stakeholders; encourage water and sanitation institutions to replicate local initiatives as a consequence of increased investment flows and with the involvement of local communities; and to work with water and sanitation institutions in participating countries to develop enhanced capacity to track progress towards internationally agreed targets based on improved information systems and enhanced monitoring frameworks.

4. Fiji, Kiribati, Marshall Islands, Federated States of Micronesia, Nauru, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu

Annex 6

Proposed indicators to measure progress of SDG Goal 6, targets 6.1 and 6.2

Proposed indicators for monitoring drinking-water services

Drinking-water service ladder	Proposed indicator	Definition	Data sources and measurability
Sustainable drinking-water	Percentage of population using sustainable drinking-water sources.	Percentage of population using a safely-managed drinking water source that reliably provides expected levels of service and is subject to robust regulation and a verified risk management plan.	Currently not considered as a feasible global indicator. Nonetheless, many countries will have or strive to develop monitoring systems which go well beyond the elements considered in 'safely managed drinking water services'.
Safely managed drinking-water services	Percentage of population using safely managed drinking-water services.	Population using a basic drinking-water source which is located on premises and available when needed and free of faecal (and priority chemical) contamination.	Household surveys can provide data on basic water on premises as well as availability when needed and freedom from contamination via direct water quality testing. Administrative sources (utilities, government offices, etc.) can provide data on freedom from contamination, regulation of water safety and risk management.
Basic drinking-water services	Percentage of population using basic drinking-water services.	Percentage of population using an improved drinking-water facility ^a with a total collection time of no more than 30 minutes for a roundtrip including queuing.	Household surveys

Proposed indicators for monitoring drinking-water services (continued)

Drinking-water service ladder	Proposed indicator	Definition	Data sources and measurability
Unimproved drinking-water	Percentage of population using inadequate sources of drinking-water.	Percentage of population using a drinking-water source that does not adequately protect the source from outside contamination ^b , particularly faecal matter or is not easily accessed (> 30 minutes collection time).	Household surveys
No service	Percentage of population using surface water sources.	Percentage of population using water directly from surface water sources ^c .	Household surveys

Source: WHO and UNICEF (2015b)

Proposed indicators for monitoring sanitation services

Sanitation service ladder	Proposed indicator	Definition	Data sources and measurability
Sustainable sanitation	Percentage of population using a safely-managed sanitation facility.	A safely-managed sanitation facility reliably provides expected levels of service, and is subject to robust regulation and a verified risk management plan.	Household surveys, administrative, population and environmental data. Currently not considered as a feasible global indicator.
Safely managed sanitation	Percentage of population using a basic sanitation facility ^a .	Population using a basic sanitation facility which is not shared with other households and where excreta is safely disposed in situ or transported to a designated place for safe disposal or treatment.	Household surveys can provide data on types of sanitation facilities and disposal in situ. Administrative, population and environmental data can be used to estimate safe disposal/transport of excreta, when no country data are available.
Basic sanitation	Percentage of population using a basic sanitation service.	Percentage of population using an improved sanitation facility ^b not shared with other households.	Household surveys
Shared sanitation	Percentage of population using a shared sanitation facility.	Percentage of population using an improved sanitation facility shared with other households.	Household surveys
Unimproved sanitation	Percentage of population using an unimproved sanitation facility ^c .	Percentage of population using a sanitation facility that does not hygienically separate human excreta from human contact or is shared with other households.	Household surveys
No service (open defecation)	Percentage of population practising open defecation.	Percentage of the population practicing open defecation (defecating in bushes, fields, open water bodies or other open spaces).	Household surveys

Source: WHO and UNICEF (2015b)

- a. A basic sanitation facility is an improved sanitation facility that is not shared among households.
- b. Improved sanitation facilities include the following: flush or pour flush toilets to sewer systems, septic tanks or pit latrines, ventilated improved pit latrines, pit latrines with a slab, and composting toilets.
- c. Unimproved sanitation facilities (MDG 'unimproved' indicator) include: flush/pour flush not going to sewer/septic/pit, pit latrines without a slab, hanging and bucket latrine.

Proposed indicators for monitoring drinking-water, sanitation and hygiene in schools and health establishments

Hygiene indicators	Proposed indicator	Definition	Data sources and measurability
Basic drinking-water in schools	Percentage of primary and secondary schools with an improved drinking water source on or near premises and water points accessible to all users during school hours.	Water from an improved source on or near premises capable of delivering sufficient water at all times for drinking, personal hygiene and, where appropriate, food preparation, cleaning and laundry. Five litres per capita per day (lpcpd) are available for non-residential schoolchildren and staff in non-residential and day schools; and 20 litres per capita/day are available for all residential schoolchildren and staff in boarding schools. Additional quantities of water may be required depending on sanitation facilities (e.g. pour flush or flush toilets). Drinking water points are accessible to all users, including those with disabilities, throughout the school day.	Institution surveys, administrative data, Education Management Information Systems
Basic drinking-water in health care facilities	Percentage of health facilities with an improved drinking water source on premises and water points accessible to all users at all times.	Water from an improved source on premises capable of delivering the minimum quantity of water that is required for different situations in the health care setting as defined by WHO. Drinking water points are accessible to all users, including those with disabilities, throughout the day.	Institution surveys, administrative health management, Information Systems
Basic sanitation in schools and health facilities	Percentage of primary and secondary schools with basic sanitation facilities. Percentage of health facilities with improved sanitation facilities.	Basic sanitation services in schools and health facilities: are those that effectively separate excreta from human contact, and ensure that excreta do not re-enter the immediate environment. This means improved sanitation facilities which: <ul style="list-style-type: none"> • are located in close proximity to the school or health facility; • are accessible to all users, including adults and children, the elderly, and those with physical disabilities; • provide separate facilities for males and females (boys and girls at school), and for adults and children; 	Institution surveys, administrative data, Education and health management Information Systems

Proposed indicators for monitoring drinking-water, sanitation and hygiene in schools and health establishments (continued)

Hygiene indicators	Proposed indicator	Definition	Data sources and measurability
Basic sanitation in schools and health facilities (continued)		<ul style="list-style-type: none"> • at schools, provide at least one toilet per 25 girls and at least one toilet for female school staff, as well as a minimum of one toilet plus one urinal (or 50 cm of urinal wall) per 50 boys, and at least one toilet for male school staff; • at in-patient health centres, include at least one toilet per 20 users; • at out-patient health centres, include at least four toilets – one each for staff, female patients, male patients, and child patients. 	
Basic handwashing facilities in schools and health facilities	<p>Percentage of primary and secondary schools with a handwashing facility with soap and water in or near sanitation facilities.</p> <p>Percentage of primary and secondary schools with a handwashing facility with soap and water near food preparation areas.</p>	<p>Basic handwashing facilities in schools and health facilities. Handwashing facilities, with soap and water, available in or near sanitation facilities, where food is prepared or consumed, and in patient care areas.</p>	<p>Institution surveys, administrative data, Education and health management Information Systems</p>
Basic menstrual hygiene management facilities in schools and health facilities	<p>Percentage of primary and secondary schools with basic menstrual hygiene management facilities.</p> <p>Percentage of health establishments with basic menstrual hygiene management facilities.</p>	<p>Basic menstrual hygiene management facilities in schools and health facilities: Separate sanitation facilities for females that provide privacy; soap, water and space for washing hands, private parts and clothes; and places for changing and disposing of materials used for managing menstruation.</p>	<p>Institution surveys, administrative data, Education and health management Information Systems</p>

Source: WHO and UNICEF (2015b)

Proposed indicators for monitoring hygiene in the household

Hygiene in the household	Proposed indicator	Definition	Data sources and measurability
Basic handwashing facilities	Percentage of households with soap and water at a handwashing facility commonly used by family members.	Basic handwashing facilities are those where handwashing facilities, with soap and water, are available in or near sanitation facilities and where food is prepared or consumed.	Household surveys
Unimproved handwashing facilities	Percentage of hand washing facility without soap or water.	Handwashing facilities are those without either soap or water.	Household surveys
No facility	Percentage of households without handwashing facilities.	Absence of handwashing facilities used by family members.	Household surveys

Source: WHO and UNICEF (2015b)

