Integrating Poverty and Gender into Health Programmes

A Sourcebook for Health Professionals

Module on Water, Sanitation and Food

World Health Organization
Western Pacific Region
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ABBREVIATIONS

ADB  Asian Development Bank
AMC  Ahmadabad Municipal Corporation
CEDAW  Convention on the Elimination of All Forms of Discrimination against Women
DALY  Disability-adjusted life year
FAO  Food and Agriculture Organization
HDI  Human development index
MDG  Millennium Development Goal
NGO  Nongovernmental organization
PCB  polychlorinated biphenyl
PRSP  Poverty Reduction Strategy Paper
SEWA  Self-Employed Women’s Association
SOPAC  Pacific Islands Applied Geoscience Commission
UN  United Nations
UNDP  United Nations Development Programme
UNICEF  United Nations Children’s Fund
WHO  World Health Organization

Note: In this publication, $ means US dollar.
PREFACE

Over the past two to three decades, our understanding of poverty has broadened from a narrow focus on income and consumption to a multidimensional notion of education, health, social and political participation, personal security and freedom, and environmental quality. Thus, poverty encompasses not just low income, but lack of access to services, resources and skills; vulnerability; insecurity; and voicelessness and powerlessness. Multidimensional poverty is a determinant of health risks, health seeking behaviour, health care access and health outcomes.

As analyses of health outcomes become more refined, it is increasingly apparent that the impressive gains in health experienced over recent decades are unevenly distributed. Aggregate indicators, whether at the global, regional or national level, often mask striking variations in health outcomes between men and women, rich and poor, and across and within countries.

An estimated 70% of the world’s poor are women. Similarly, in the Western Pacific Region, poverty often wears a woman’s face. Indicators of human poverty, including health indicators, often reflect severe gender-based disparities. In this way, gender inequality is a significant determinant of health outcomes in the Region, with women and girls often at a severe societal disadvantage.

Although poverty and gender significantly influence health and socioeconomic development, health professionals are not always adequately prepared to address such issues in their work. This publication aims to improve the awareness, knowledge and skills of health professionals in the Region on poverty and gender concerns.

The modules that comprise this Sourcebook are intended for use in pre-service and in-service training of health professionals. It is expected that this publication will also be of use to health policy-makers and programme managers as a reference document, or in conjunction with in-service training.

All modules in the series are linked, though each one can be used on a stand-alone basis if required. Two foundational modules, of which this is one, set out the conceptual framework for the analysis of poverty and gender issues in health. Each of the other modules is intended for use in conjunction with these two foundational modules. The Sourcebook also contains a module on curricular integration to support health professional educational institutions in the process of integration of poverty and gender concerns into existing curricula.

All modules in the Sourcebook are designed for use through participatory learning methods that involve the learner taking advantage of his or her experience and knowledge. Each module contains facilitators’ notes and suggested exercises to assist in this process.

It is hoped that the Sourcebook will prove useful in bringing greater attention to poverty and gender concerns in the design, implementation and monitoring and evaluation of health policies, programmes and interventions.
Introduction
The Western Pacific Region has made great strides in improving access to clean water and sanitation in recent years. On average, the Region is making significant progress towards meeting the Millennium Development Goal for clean water and adequate sanitation. However, these averages mask striking inequalities in access to clean water and adequate sanitation across and within countries in the Region. Evidence shows that poor individuals and households in rural and remote communities and urban poor areas are significantly less likely to enjoy access to sufficient amounts of secure and affordable clean water and adequate sanitation than those who are better-off. In addition, men and women’s needs, access to and use of adequate water and safe sanitation tend to differ.

With regard to food safety, the Western Pacific Region has made progress in establishing and strengthening national food safety systems, and responding to outbreaks of foodborne diseases. However, there is some evidence to suggest that poor households are more vulnerable to foodborne pathogens than are wealthier counterparts. As is the case with water and sanitation, gender roles accord a more significant role to women than to men in handling and preparing food.

The knowledge and tools needed to drastically improve the coverage of clean water, adequate sanitation and safe food largely exist. Mobilizing support for these interventions in developing countries will improve the health of millions, thereby contributing to poverty reduction and gender equality.

This module is designed to improve the awareness, knowledge and skills of health professionals regarding poverty and gender concerns in actions to improve access to clean water, adequate sanitation and safe food.

The module is divided into six sections:

- **Section 1** defines clean water, adequate sanitation and safe food, as well as waterborne and foodborne hazards and diseases. It also describes the distribution of clean water, adequate sanitation and safe food globally and within the Western Pacific Region specifically.
- **Section 2** examines WHAT the links are between poverty, gender and clean water, adequate sanitation and safe food.
- **Section 3** discusses WHY health professionals should address poverty- and gender-related concerns with reference to clean water, adequate sanitation and safe food, from efficiency, equity and human rights perspectives.
- **Section 4** discusses HOW health professionals can address poverty and gender concerns in policies, plans, programmes and services to expand access to clean water, adequate sanitation and safe food. Examples of good practice are presented to illustrate potential interventions.
- **Section 5** provides notes for facilitators.
- **Section 6** is a collection of tools, resources and references to support health professionals in their work in this field.
1. What are safe food and water and adequate sanitation?
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Clean water, adequate sanitation and safe food are essential for life. The body needs a constant supply of clean water and a range of safe and nutritious foods to function properly. Without these, humans cannot survive. Similarly, clean and safe environments with adequate sanitation protect people from degrading surroundings that can cause disease and death.

**Safe food and water**

According to the World Health Organization (WHO), “safe water” is water that does not pose any significant risk to health over a lifetime of consumption. Safe water is suitable for domestic use, is free of objectionable tastes and odours and is available in sufficient quantities for hygiene purposes. Similarly, “safe food” is defined as food that will not cause harm to the consumer when it is prepared and/or eaten according to its intended use. The Codex Alimentarius defines a “hazard” as a biological, chemical or physical agent in, or condition of, food with the potential to cause adverse health effect. To be safe, both food and water should not contain any biological, chemical or physical agents at concentrations directly detrimental to health. Safe food is achieved when all conditions and measures necessary to ensure the safety and suitability of food at all stages of the food chain are present and being applied.

This understanding of safe food and water takes into account the varying vulnerabilities that may occur as people move through different stages of the life-cycle. For example, infants and young children, as well as the elderly, are more vulnerable to the effects of unsafe food and water—often suffering greater adverse consequences—compared to young or middle-aged adults. People who are malnourished or living in unsanitary conditions are also more vulnerable than those who are well-nourished and/or living under hygienic conditions. People living with AIDS, who may be more susceptible to waterborne and foodborne organisms than healthy individuals, must take additional precautions. Pregnant women and their fetuses are also more vulnerable to hazards in the food consumed during pregnancy and need to take greater caution in their food choices and food handling practices.

Rather than specifying an international standard for safe drinking water, WHO recommends setting drinking water standards at national or regional levels. WHO argues that acceptable levels of risk are best determined by societies that are able to weigh the benefits of higher drinking water standards against the increased costs of implementing those standards. However, continuous efforts are required to maintain the highest possible standards over time. In relation to food safety, the Codex Alimentarius specifies international standards, codes of practice and guidelines so that governments worldwide can harmonize their standards to facilitate trade in safe and suitable food.

**Adequate sanitation**

Access to basic or adequate sanitation is vital for human health, while having a safe, convenient and private place to defecate is essential for human dignity. Adequate sanitation refers to the use of a “sanitary facility” in a dwelling or immediate vicinity. A sanitary facility is a unit for the disposal of human excreta that isolates faeces from contact with people, animals, crops and water sources. The World Summit on Sustainable Development in 2002 proposed a much broader definition of basic sanitation that focused on the links between access to sanitation and human health.

Building on this broader definition, experts recently proposed to define basic sanitation as comprising the “lowest-cost option for securing sustainable access to safe, hygienic and convenient facilities and services for excreta and sullage disposal that provide privacy and dignity while ensuring a clean and healthful living environment both at home and in the neighbourhood of users.” This definition captures the relationship between sanitation and human health and highlights that dignity and privacy are important elements of basic sanitation, as these promote the use of sanitary facilities. This approach demands a...
more nuanced and context-specific understanding of basic sanitation than those that focused on sanitary facilities alone.

**Measuring safe food and water and adequate sanitation**

The Millennium Development Goals (MDGs) recognize the importance of safe water and adequate sanitation for improved health and development. Implicit in the MDGs is also a concern for food safety. The MDGs are a series of time-bound and measurable targets that United Nations Member States committed themselves to realizing by signing the Millennium Declaration in 2000. The MDGs reflect a multidimensional understanding of poverty; thus, progress towards any one of the goals contributes towards the achievement of the other goals.

Under Goal 7 (to ensure environmental sustainability), world leaders have committed themselves to Target 10: to halve the proportion of people without sustainable access to safe drinking water and sanitation by 2015. Reaching this target requires addressing both the quantity (access) and quality (safety) aspects of providing drinking water and sanitation.5

Goal 4 aims to reduce child mortality, with the target to reduce by two thirds, between 1990 and 2015, the under-five mortality rate. It is generally accepted that efforts to achieve this goal must focus on reducing diarrhoeal disease in children. Consumption of unsafe food and limited access to clean water and adequate sanitation are among the key causes of diarrhoeal disease. Progress towards this MDG thus requires improved access to clean water and adequate sanitation, along with efforts to ensure that all individuals consume safe food.

However, operationalizing the definitions of safe food and water and adequate sanitation outlined above has proven to be challenging. In practice, it is difficult to assess safe food and water and adequate sanitation at the national and local levels with confidence and accuracy.

Efforts to analyse access to safe drinking water and adequate sanitation tend to rely on household surveys or other measurements that do not easily capture the notion of “safety” and “quality” implicit in the definitions outlined above.6 In the case of drinking water, assessing safety would require physical, chemical and microbial testing and sanitary inspection of water sources. Those who conduct household surveys, however, rarely have the level of expertise and sophisticated equipment required for such an undertaking.

In response to the challenges related to water and sanitation, analysts tend to identify particular

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**Box 1: What “no access to basic sanitation” means in practice**

Early in the morning, Vidya slips out of his shack on the banks of the Sabarmati River in India carrying a precious lota (vessel) of water and hurries down to the dry riverbed. Weaving between the excrement and rubbish he finds an “open” space and, in company with hundreds of other men from his community, he defecates. The space is a bit smelly and not very private, but he is considered lucky. For a start, his walk is short and safe, and his destination has a breeze—even at the height of summer. Others are far less fortunate.

When day breaks across the world, precious hours are wasted as men, women and children search for a safe and secluded spot. Women—walking farther than men and often running the risk of attack, ridicule and shame—pass young boys and girls who will miss school today because there are no toilets. In the cities, working women are gearing up for a day with no chance of a “toilet break,” while men will have to find any available open space, to the disgust of passing observers. All of them face repeated cases of diarrhoea, schistosomiasis, trachoma, and other water-related diseases. In essence, they have no sustainable access to basic sanitation.

types of technologies to determine whether areas covered by water supplies and sanitation facilities are “safe” and of a given “quality”. Analyses that assess the coverage of “safe water” and “adequate sanitation” by the types of technology employed tend to refer to “improved” water supply or source and “basic” or “improved” sanitation. The information needed to measure access to improved or unimproved drinking water sources and sanitation facilities can be easily collected from households.

The types of technologies described as “improved” water sources are those that greatly increase the likelihood that the water supply is safe. More specifically, WHO defines improved water supply sources as those characterized by (1) a significantly increased probability that the water is safe, (2) a significantly increased probability that it is more accessible, and (3) some measures being taken to protect the water source against contamination. Table 1 provides examples of “improved” and “not improved” water supply sources. Notably, “unimproved” sources are those that are considered not only unsafe, but also unnecessarily costly, such as the water provided in bottles or by tanker truck. In addition, the United Nations defines “access to water” as availability of at least 20 litres of clean water per person per day from a source within 1 kilometre from the place of residence.

As with improved water supply, “improved” sanitation facilities are those that are more likely to prevent human contact with human excreta than unimproved facilities. Improved sanitation facilities include simple but protected pit latrines or flush toilets with sewerage or septic system connections. Table 2 lists “improved” and “not improved” sanitation facilities. To be effective, all facilities must be correctly constructed and properly maintained.

Notably, data collected from service providers on the coverage of improved drinking water sources and basic or improved sanitation facilities do not indicate whether such facilities are actually being used. Such data are thus likely to present a brighter picture of progress on improved sanitation than may be warranted. For this reason, the WHO-UNICEF Joint Monitoring Programme seeks to measure the population using improved drinking water sources and improved sanitation facilities by analysing data from surveys that ask people about their use of water and sanitation facilities, rather than relying on data collected from service providers.

For example, the indicators used to measure progress towards MDG Target 10 are: (1) proportion of population with sustainable access to an improved drinking water source; and, (2) proportion of population with access to improved sanitation. In practice, these indicators are analysed as the percentage of people using improved drinking water sources or delivery points and improved sanitation facilities.

While this approach constitutes an important advance in our understanding of access to these basic services, it provides few insights into other relevant indicators, such as the reliability of

| Table 1: Examples of water supply technologies considered to be “improved” and “unimproved” |
|----------------------------------------|----------------------------------------|
| Improved                              | Unimproved                             |
| Household connection                   | Unprotected well                       |
| Public standpipe                       | Unprotected spring                     |
| Borehole                               | Vendor-provided water                  |
| Protected spring or well               | Bottled water                          |
| Collected rainwater                    | Tanker truck provision                 |
| Water disinfected at the point-of-use  | of water                               |


| Table 2: Examples of sanitation technologies considered to be “improved” and “unimproved” |
|----------------------------------------|----------------------------------------|
| Improved                              | Unimproved                             |
| Sewer connection                      | Service or bucket latrines             |
| Septic tank                           | Public latrines                        |
| Pour-flush latrine                    | Latrines with an open pit              |
| Simple pit latrine                    |                                        |
| Ventilated improved pit latrine       |                                        |

What are safe food and water and adequate sanitation?

Water supplies, the distance to water or sanitation facilities, and the actual level of hygiene of sanitation facilities. "Improved" sources may, in fact, not be functioning properly because of deficits or decay. Intermittent supply can be a real problem, particularly in areas that experience a prolonged dry season. Analysis shows that, in reality, households often rely on both improved and unimproved water sources, suggesting that the picture is much more complex and dynamic than that presented by global monitoring data.

In addition, poor populations tend to be underrepresented in national household-based surveys and, as the sections below argue, these populations are the ones that experience the most constrained access to safe drinking water and improved sanitation. For example, an analysis of national data from Indonesia shows that the coverage rate for improved water in Jakarta is above 90%. However, surveys that include large numbers of informal residents conclude that less than 25% of the urban population is served by improved water sources, while the remaining population depends on rivers, lakes, private water vendors, and other sources.

Assessing food safety requires the monitoring of food hygiene and the presence of hazards in food along the entire food chain, including in the home. Because it is innately difficult to do this, food regulatory authorities commonly monitor only parts of the food chain, with food hygiene in the home rarely being assessed. Where attempted, an assessment of food hygiene in the home might involve a simple questionnaire, self-monitoring by food handlers through a diary or other record, or a brief inspection of the home for particular technologies or practices associated with good hygiene in food handling, such as water supply, sanitation, refrigeration, cooking capacity and food temperature. For street-vended food, accessibility to these technologies is also commonly assessed. In addition, testing for the presence of hazards in food also requires methodologies, equipment and expertise that are often absent at local, provincial and national levels, particularly in developing countries.

Bearing these points in mind, the next section reviews the use of safe food and drinking water and adequate sanitation globally and in the Western Pacific Region.

### The distribution of safe water and adequate sanitation

An estimated 5.3 billion people, or 83% of the world’s population, had access to water from an improved source in 2004. While this is a significant increase from 1990, when the proportion was 78%, the rate of increase has just barely kept up with population growth (Table 3). As a result, the proportion of people without access to improved water sources has not substantially decreased. An estimated 1.1 billion people, roughly one-sixth of the world’s population, still do not have access to improved drinking water. Of these people, 84% live in rural areas. The global population without access to improved drinking water is largely concentrated in three regions: Sub-Saharan Africa (322 million), Eastern Asia (302 million) and South Asia (226 million). Overall, the coverage of improved drinking water is above 78% in all regions of the world, except Sub-Saharan Africa and Oceania, where the coverage levels are 56% and 50%, respectively (Figure 1).

<table>
<thead>
<tr>
<th>Year</th>
<th>Total population</th>
<th>Population served</th>
<th>Population unserved</th>
<th>% population served</th>
<th>% house connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>5280</td>
<td>4092</td>
<td>1187</td>
<td>78</td>
<td>49</td>
</tr>
<tr>
<td>2004</td>
<td>6389</td>
<td>5320</td>
<td>1069</td>
<td>83</td>
<td>54</td>
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In contrast to the situation regarding coverage of improved drinking water, only 59% of the global population had access to any type of improved sanitation facility in 2004 (Figure 2). In other words, 2.6 billion people did not have access to improved sanitation facilities; the majority of these people (2 billion) lived in rural areas. Table 4 shows the increase in access to improved sanitation since 1990. As is the case with improved drinking water, the lowest coverage rates were found in sub-Saharan Africa, (37%), South Asia (38%) and Eastern Asia (45%). The gap between the coverage of clean water and improved sanitation ranges from 50% in South Asia to 18% in sub-Saharan Africa. Overall, there is little evidence to suggest that the gap between the provision of clean water and improved sanitation is narrowing. Such gaps diminish the positive impact clean water can have on the health of men and women, boys and girls, as use of clean water and improved sanitation are mutually reinforcing.

In the Western Pacific Region, access to improved sources of drinking water increased remarkably from 1990 to 2002. During this period, an additional 300 million people gained access to improved drinking water. However, roughly 415 million people, about 20% of the population in the Region, continue to lack access to improved sources of drinking water. The proportion of population without access to improved sources of drinking water tends to vary greatly across countries in the Region (Figure 3).

Table 4 shows the increase in access to improved sanitation since 1990. As is the case with improved drinking water, the lowest coverage rates were found in sub-Saharan Africa, (37%), South Asia (38%) and Eastern Asia (45%). The gap between the coverage of clean water and improved sanitation ranges from 50% in South Asia to 18% in sub-Saharan Africa. Overall, there is little evidence to suggest that the gap between the provision of clean water and improved sanitation is narrowing. Such gaps diminish the positive impact clean water can have on the health of men and women, boys and girls, as use of clean water and improved sanitation are mutually reinforcing.

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As is the case globally, the coverage of improved sanitation lags behind that of improved sources

<table>
<thead>
<tr>
<th>Year</th>
<th>Total population</th>
<th>Population served</th>
<th>Population unserved</th>
<th>% population served</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total population</td>
<td>5280</td>
<td>6389</td>
<td>2569</td>
<td>3777</td>
</tr>
</tbody>
</table>

of drinking water in the Region. From 1990 to 2002, roughly 426 million people gained access to improved sanitation, thereby increasing coverage in the Region to 50%. This leaves an estimated 1 billion people without access to improved sanitation. The magnitude of this challenge is illustrated by the fact that two out of five people who lack access to improved sanitation worldwide reside in the Western Pacific Region.17

Variations in the use of improved sanitation facilities between countries in the Region are larger and more striking than those for use of improved drinking water. While people largely have access to improved sanitation facilities in developed countries in the Region, they rarely have such access in developing countries. For example, only 17% of the population in Cambodia and 31% of the population in the Solomon Islands have access to improved sanitation (Figure 4).

Water-related hazards and waterborne diseases

Unsafe water and inadequate sanitation are of great concern because they increase exposure to water-related hazards that can be detrimental to health. The majority of water-related health problems are caused by microbial hazards, while the number of chemical hazards is also appreciable.18 The concentration of microbial hazards in water is wide-ranging and often varies rapidly. Rapid shifts in intensity can lead to sudden outbreaks in waterborne diseases. While microbial hazards may be present in the environment naturally, contamination of water with human and animal faeces is the greatest concern. Human and animal
faeces can be the source of pathogenic bacteria, viruses, protozoa and helminths. The links between faecal contamination of food and water and inadequate sanitation facilities and poor personal hygiene are shown in Figure 5. When sanitary facilities are not available, people defecate in the open, and their faeces, contaminated with bacteria, viruses and parasites, come in contact with water sources, food, other people, animals, etc. When people drink the contaminated water, eat the contaminated food or ingest contaminants from other sources, such as fingers, diseases may spread. Diarrhoea is the most common disease.

Water can also be contaminated with chemical hazards, including: (1) naturally occurring chemicals such as arsenic, fluoride and mercury; and (2) chemicals introduced through agro-industrial and processing practices. In the past decade, arsenic found in tube wells in Bangladesh has been associated with skin lesions, cardiovascular lesions and bladder and kidney cancer. Arsenic has also been reported in Chile, India and Mexico. With increased use of pesticides and chemicals from manufacturing, water supplies are becoming contaminated with a wide variety of chemicals. The starkest episodes of such contamination occurred in Bhopal, India (1984), and Chernobyl, Ukraine (1986). High levels of chemical contamination can cause

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**Figure 4: Population (%) using improved sanitation in selected countries in the Western Pacific Region, 2004**


**Figure 5: Common pathways for infections that cause diarrhoea**

What are safe food and water and adequate sanitation?

Immediate problems, although the more likely scenario is for chemical contamination to cause long-term problems including cancer.

Waterborne diseases are closely linked with the low availability of adequate quantities of safe water and basic sanitation. That is, the burden of waterborne diseases is highest in areas with the lowest access to safe water and basic sanitation. In these areas, water quality may be a concern, with high levels of bacterial or chemical pollutants, or the quantity of water may be limited. In many urban areas, for example, water is rarely supplied 24 hours a day. Box 2 describes some significant water-related diseases.

WHO estimates that 1.7 million deaths worldwide are attributed to ingestion of unsafe water, inadequate water for hygiene, lack of sanitation and unsafe food (as discussed below). These factors also contribute to 1.5 million child deaths and account for 88% of deaths from diarrhoea.

The distribution of safe food and the public health impact of foodborne diseases

WHO defines foodborne illnesses as “diseases, usually either infectious or toxic in nature, caused by agents that enter the body through the ingestion of food”. Since food is essential for humans, enormous quantities of food are produced, harvested, processed, distributed, sold and consumed daily. Much of this food is safe for human consumption. However, a small percentage is either accidentally or intentionally contaminated and can contribute to foodborne illness.

Although determining the true extent of foodborne diseases is difficult, data from surveillance systems and sentinel sites indicate a high disease burden. The data, however, may not fully measure the true disease burden. To be counted in such health statistics, affected persons must seek medical care, test positive on
laboratory tests and be reported to the relevant health authorities. Medical care is not always sought when the case of foodborne disease is mild or contained. However, in many cases, foodborne illnesses can have significant health consequences, ranging from loss of appetite to more severe medical complications, such as reactive arthritis, haemolytic uraemic syndrome and sepsis. These complications depend upon the disease, duration and stage of treatment and vulnerability of the individual. As noted above, certain groups of people, particularly infants and young children, pregnant women, the elderly and those living with HIV/AIDS, may experience more severe health effects, which may, in some cases, be chronic or life threatening. For example, in pregnant women, listeriosis may lead to abortion, stillbirth or malformation of the fetus, while contaminated foods account for a substantial proportion of diarrhoea among infants and young children.\(^{24}\)

Parasites, too, can cause a variety of foodborne illnesses, ranging from diarrhoea to liver cancer. Infection with diarrhoeagenic protozoa such as *Giardia lamblia* and *Entamoeba histolytica* is normally the result of faecal contamination of a food or water source. Other protozoa, such as *Toxoplasma gondii* and *Sarcocystis hominis*, can infect the tissues of meat animals and be transmitted by undercooked meat. Worms are also foodborne parasites. Pork tapeworms (*Taenia solium*) and beef tapeworms (*T. saginata*) are widely distributed.

Food hazards may be biological, chemical or physical. Biological hazards include bacteria, viruses and parasites such as helminths and protozoa. Bacteria are generally the most important agents of foodborne illness. *Salmonella*, *Campylobacter*, *Escherichia coli* and *Listeria* are bacteria that are commonly considered to have public health significance. Certain species of *Campylobacter* bacteria present in foods (e.g. raw milk, raw or undercooked poultry) and drinking water cause campylobacteriosis. This foodborne illness causes severe abdominal pain, fever, nausea, diarrhoea and—in 2% to 10% of cases—chronic health problems, such as reactive arthritis and neurological disorders. In some countries, the reported number of cases of campylobacteriosis surpasses that of salmonellosis. Pathogenic *Escherichia coli* strains, such as *E. coli* O157, can cause haemorrhagic infections in the colon, resulting in bloody diarrhoea or life-threatening complications such as kidney failure. *E. coli* O157 outbreaks have been mainly related to beef, although sprouts, lettuce and juice have also caused outbreaks. *Listeria monocytogenes* causes listeriosis, which has a fatality rate of up to 30%. The most frequent effects are meningitis and miscarriage or meningitis of the fetus or newborn. Many types of food have been implicated in listeriosis. Salmonellosis, a major problem in most countries, is caused by the *Salmonella* bacteria, commonly resulting in fever, headache, nausea, vomiting, abdominal pain and diarrhoea. Examples of foods involved in outbreaks of salmonellosis are eggs, poultry and other meats, raw milk and chocolate.

Food and water can, however, be the vehicle for transmission of a number of different viruses that infect humans via the gastrointestinal tract. These include hepatitis A, hepatitis E, noroviruses and possibly rotaviruses. The extent of viral foodborne diseases is only beginning to be understood.

Chemical hazards in foods arise from various sources. Chemical products and by-products from modern industries can contaminate the environment, food chain and, ultimately, the human food supply. In this regard, attention has been focused mostly on heavy metals such as mercury, cadmium and lead, and organics such as polychlorinated biphenyls (PCBs). All of these chemicals are now widespread in the environment. Concentrations are usually low, except in cases of industrial accidents and environmental disasters. Mercury has toxic effects on animals and humans, particularly pregnant women, nursing mothers and children. Its most toxic form, methylmercury, damages the central nervous system. When industrial effluents containing mercury are discharged
into rivers or seas, bacteria convert the mercury into methylmercury, which then moves up the food chain and concentrates in the bodies of fish. Contamination of edible oil with PCBs has caused large-scale poisonings in Japan and elsewhere. Exposure to PCBs in the workplace is associated with an increased risk of cancer.

Foods can also carry residues of pesticides and veterinary drugs. Organochlorine pesticides such as DDT, aldrin and dieldrin were identified as problems in the early 1970s since they persist in the environment, accumulate in the fatty tissues, and increase in concentration as they pass up the food chain. Contamination is especially associated with foods such as milk, animal fats, fish and eggs. Organochlorine pesticides have increasingly been replaced by organophosphorus compounds, which do not persist in the environment or animal tissues for long periods and are seldom present in foods. However, they pose a serious health risk if ingested at high concentrations. Residues of veterinary drugs

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**Box 3: The risk of avian influenza from production to consumption**

Ongoing outbreaks of avian influenza (H5N1) in Asia since 2003, and more recently across the globe, have raised fears about risks to humans and questions about how to ensure that food is produced, prepared, stored and distributed appropriately in an era of increasing globalization. Due to the nature of avian influenza, risks to humans may occur at multiple points in the food chain.

Avian influenza is an infectious disease in birds caused by the influenza A virus. Migratory waterfowl are the natural reservoir for this virus. Of the 16 main subtypes of this virus, only the H5 and H7 subtypes are highly pathogenic. Chickens and turkeys are especially susceptible to epidemics, through contact with wild fowl or in live bird markets.

Avian influenza normally infects only birds, although it has been known to infect pigs, cats and other animals. Cases of humans infected with the H5, H7 and H9 subtypes have also been recorded. Of these subtypes, only H5 has caused severe disease with high fatality rates. H5N1 seems to have become hardier over time, surviving several days in the environment.

Evidence shows that infection with H5N1 occurs in humans through direct contact with infected live or dead poultry. In practice, this mode of transmission creates risks for humans at many points in the food chain because of how poultry is handled, slaughtered and marketed in many Asian countries.

Backyard poultry-raising, a source of income for many poor households in Asian countries, can create an opportunity for exposure to H5N1. The virus can be inhaled through dust or contracted through contact with contaminated surfaces. The virus can survive on surfaces, such as those in poultry houses and farms, for several weeks. Poultry infected with H5N1 can excrete the virus in their saliva and faeces. Home slaughtering, defeathering and eviscerating create opportunities for the virus to spread, as do practices around the marketing of live birds.

Studies show that, unlike other subtypes of avian influenza, H5N1 spreads to most parts of infected birds, including meat. The virus thus survives in contaminated raw poultry meat and can be found on the surface of and inside eggs. Common marketing and distribution practices of fresh and frozen meat and eggs can result in the spread of the virus.

To date, there is no evidence of human infection from eating eggs or properly cooked foods. Some cases of human infection, however, have been linked to the consumption of raw poultry products. Normal cooking has been found to inactivate the virus.

such as antibiotics can also find their way into milk or meat. In many cases, their long-term effects on human health are not known. However, they can, for example, provoke strong allergic reactions in sensitive people and encourage antibiotic resistance in bacteria, making treatment of human infection more difficult. Therefore, antibiotics used in human medicine should not be used for animals.

Chemical contaminants may be introduced as a result of food processing and storage. In addition, many plants that serve as staple human foods contain a range of secondary compounds that can be toxic. For example, legumes contain protease inhibitors and haemagglutinins (lectins) which, if ingested, can inhibit growth and sometimes cause illness; cassava cultivars contain the cyanogenic glucosides linamarin and lotaustralin; and several plants, including mustard, cabbage, broccoli, turnip and watercress, produce glucosinolates that have been associated with hypothyroidism, endemic goitre, and growth impairment in farm animals. Further, some moulds can produce toxic substances, known as mycotoxins, leading to a range of disorders from gastroenteritis to cancer. More than 300 mycotoxins have been identified, but only a few occur in human and animal foods at levels sufficient to cause concern.

The Food and Agriculture Organization (FAO) estimates that up to 25% of the world’s foods are significantly contaminated with mycotoxins. Also, transmission of algal toxins to humans is often associated with the consumption of shellfish.

Food hygiene recognizes the risks of contamination throughout the food chain and creates the conditions and measures necessary to ensure safety and sustainability of food at all stages of this process.25

Several innovative approaches have been used in recent years to circumvent the difficulties arising from under-reporting and to measure the disease burden of various foodborne diseases more adequately. These approaches include active surveillance, field studies, risk assessment, and epidemiological disease modelling. However, for many other foodborne diseases, including some zoonoses and diseases caused by chemical hazards, data or studies do not exist. To move beyond merely counting morbidity and mortality and to provide more complete information for policy-makers, it is important to develop a summary measure—such as the disability-adjusted life year (DALY) measure, which includes elements of severity and duration of disease, as well as resulting disability.
2. What are the links between safe food, clean water, adequate sanitation and poverty and gender?
2. What are the links between safe food, clean water, adequate sanitation and poverty and gender?

As the preceding section demonstrates, great strides have been made in improving access to clean water and adequate sanitation for populations in the Western Pacific Region. In addition, food safety systems are operational in many countries in the Region. In spite of this progress, the effect of these initiatives is difficult to ascertain, given the lack of regular reporting. Access to basic necessities remains severely constrained for many population groups throughout the Region. In many countries, these constraints are increasing because of population growth, industrialization and urbanization. Indeed, limited or no access to clean water, adequate sanitation and safe food remain striking elements of poverty in many countries in the Region.

The idea that water, sanitation and safe food are necessary for a healthy, active and dignified life is captured in the very notion of what it is to be poor. While earlier definitions of poverty tended to focus more on income; more recent conceptualizations of poverty also encompass a lack of access to clean water, adequate sanitation and consumption of safe and nutritious foods. For example, the Human Development Index captures the most basic human capabilities—good health, knowledge and access to private and public resources. The last of these variables is measured by: access to health services, clean water and sanitation and the percentage of malnourished children under 5 years. Box 4 discusses how poverty is conceptualized in this module.

Women within poor households tend to be particularly disadvantaged and lag behind men in almost every social and economic indicator of well-being. This is illustrated by the differential impact of limited access to clean water, adequate sanitation and safe food on men and women, boys and girls.

Poverty and water, sanitation and food

The effect of poverty on access to clean water, improved sanitation and safe food

Inequalities in the coverage of improved drinking water, improved sanitation and safe food

Impressive improvements in access to clean water, adequate sanitation and safe food have been witnessed throughout the Western Pacific Region. While such improvements at the regional level, as at the global level, tell a promising story, these data tend to mask variations between countries with respect to access to these basic services.

The coverage of improved water and sanitation tends to be positively correlated with levels of development, both among countries in the Region and across the globe. Worldwide, a significant positive association exists between access to water supply and per capita national...
What are the links between safe food, clean water, adequate sanitation and poverty and gender?

Income (see Figure 6). This association is replicated within the Western Pacific Region. An analysis of the coverage of improved water and sanitation sources reveals continued inequalities between countries in the Region, with low-income countries having achieved dramatically lower rates of coverage of improved water and sanitation than high-income countries. Overall, for countries in the Region with available data, improved drinking water coverage rates of less than 100% tend to be found only in developing countries. High-income countries have achieved full coverage of both improved drinking water and improved sanitation. The notable exception is French Polynesia, where coverage of improved sanitation is 97%.

Figure 7 presents the coverage of improved drinking water for selected countries in the Region by level of development. As the figure shows, the coverage of improved drinking water tends to increase with the level of a country’s development. The variations within this overall trend point to the fact that level of development is only one among many factors that influence the coverage of improved drinking water. Another factor, for example, is the effectiveness of public policies. These issues are discussed in more detail in Section 4.

In many countries in the Region, the coverage of improved sanitation is even lower than that achieved for improved drinking water. Four countries in the Region, namely, Cambodia, the Lao People’s Democratic Republic, the Federated States of Micronesia and Solomon Islands,
rank among the 27 countries worldwide where coverage of improved sanitation was one third or less in 2002. By 2004, levels of coverage still remained below one third in these countries. The trend outlined in Figure 8 suggests not only that coverage of improved sanitation tends to be much lower than that of improved drinking water among countries in the Region, but also that the generally positive association between coverage rates and level of development is less consistent.

Box 5 highlights some of the unique challenges for Pacific island countries.

Inequalities in access to clean drinking water and improved sanitation between countries in the Region are reproduced within many countries as well: a growing body of analysis using disaggregated data reveals that poor communities and households are often disadvantaged with regard to access to improved drinking water and improved sanitation, compared to those that are better-off. For example, an analysis of data from 20 developing countries found that a household water connection, which is the highest level of service, was closely associated with household income: the households in the richest income quintile were twice as likely to use drinking water from an improved source than those from the poorest income quintile in 2002 (Figure 9). This rich–poor gap almost doubles when use of improved sanitation is considered (Figure 10).
What are the links between safe food, clean water, adequate sanitation and poverty and gender?

The positive association between household income and access to clean water and adequate sanitation arises for a number of reasons that may vary among countries. In general, a number of structural factors tend to disadvantage poor households relative to those that are better-off. To begin with, many countries have relied on utilities to deliver water and sanitation over large areas at a low price. In many areas, water utilities supply cheap, often reliable water to households that are connected to the network. Sewage utilities provide similarly cost-effective services. Patterns of investment, and in some cases underinvestment, in these systems have left rural areas and poor urban communities unconnected and thus dependent upon other technologies and systems to access clean water and improved sanitation. Functioning sewage utilities tend to be even rarer than water utilities. Where utilities are present and well functioning, the pricing systems, especially those for water, can be barriers to access for poorer households.

Box 5: Water and sanitation challenges in the Pacific

Reaching the MDG for clean water and improved sanitation is particularly challenging for Pacific island countries for a number of reasons, including: their small size, densely populated urban settlements with strained infrastructure, rapid urbanization, high levels of tourism, and vulnerability to weather patterns and climate change.

Groundwater resources are scarce in many Pacific island countries. A number of countries in the Pacific, such as Kiribati, contain small outer islands and atolls. In such settings, rainwater collected or groundwater pumped from basal aquifers may be the main source of water. Other island nations, such as Fiji, rely mainly on surface water to meet their water needs.

Water supplies may also be intermittent. For example, an estimated 37% of households in Fiji reported that their “water does dry up sometimes or every year”. In remote areas, this proportion increased to over 80%. During periods of drought, water supplies may shrink to very low levels.

Given their small size, some island communities face difficulties ensuring that sanitation systems remain separate from water supplies. Polluted water supplies are endemic in many low-lying coral islands due to the short travel time from sanitation facilities to freshwater facilities through groundwater. This leads to an increasing risk of waterborne disease.

In addition, the general lack of information is a challenge in enabling water resources development and protection. Awareness of the health- and hygiene-related problems associated with contaminated water is also generally lacking.

Climate change is expected to put additional stress on already scarce water resources, amplifying the challenges of ensuring a continued water supply in the Pacific. Safeguarding these fragile resources is essential to the survival of these communities.


The Figure 10: Share of the population using improved sanitation in 20 developing countries, by wealth quintile, 2002

Source: UN Millennium Project, 2005a.
Households that are not connected to a utility, or supported through community-based water and sanitation systems, tend to rely on a variety of unimproved water and sanitation sources. With regard to water sources, many supply water at high costs, are located far from the household and are of dubious quality and reliability. As a result, low-income households tend to use less water than those who are better-off and must contend with greater exposure to waterborne hazards and diseases. These issues are explored in greater depth in the following sections. Households that are not connected to a sewage utility can sometimes rely on other improved sanitation facilities, but often the cheapest form of sanitation is open defecation or using a plastic bag that is later thrown away. Box 6 discusses some of the reasons why efforts to extend the coverage of adequate sanitation have lagged behind those for clean water.

The burden of foodborne diseases tends to vary across countries. Globally, low-income countries tend to experience a higher incidence of foodborne diseases than higher-income countries. Such inequalities are likely to be found in the Region as well because developed countries have set up comprehensive food safety systems that are functioning well. This is evidenced by advances in food hygiene, food protection and food control.

Box 6: The sanitation deficit: public versus private goods and the challenge of stigma

The health benefits of improved water and sanitation are most effective for poor households when both of these services are available together. In spite of the well-documented synergy between improved water and improved sanitation, a huge gap in the coverage of sanitation exists at the global and national levels. At the international level, improving sanitation coverage has not always received the same priority as efforts to improve the coverage of improved water. This is evidenced by the late addition of a target on increasing access to improved sanitation to the MDGs. While the reasons for this may be complex, some important insights can be gained by exploring attitudes towards water and sanitation at the household and community levels.

Among households without access to clean water or adequate sanitation, the demand for clean water is often stronger and more clearly vocalized than that for sanitation. This may be the case for a number of reasons.

First, perceptions about the private and public benefits of the two types of facilities differ. For example, the benefits of a sufficient amount of clean water are primarily private—safe water protects the health and well-being of individuals and households. In contrast, adequate sanitation is perceived to protect the health and well-being of neighbours, thus having a primarily social benefit. Similarly, improved sanitation among a community protects downstream communities. Therefore, these public benefits of adequate sanitation do not always translate into effective demand at the private (individual or household) level.

Second, experience shows that the private benefit associated with adequate sanitation, namely, having a private, convenient and safe place to defecate, can be met quite cheaply by defecating in open spaces away from the house or defecating into a plastic bag and throwing it away. In addition, this private benefit is valued more highly by women than by men. Unfortunately, women’s voices are not always heard in community and national planning. As a result, the recent move towards service fees as a vehicle to extend access to clean water has not been successful for sanitation, as there is low willingness to pay for this service in many communities.

Third, demand for sanitation is further muted by the strong stigma associated with sanitation in many communities. Open and frank discussion on faecal mater and defecation is rare and these topics continue to be taboo. This can affect the willingness of community-leaders and politicians to mobilize support for the issues.

Similarly, developed countries in the Region often have surveillance systems that track food safety issues and quickly report outbreaks and epidemics. These and other systems are not always replicated in developing countries, where food safety systems tend to be weak and under-funded. As a result, data on food safety from developing countries remain scarce and food safety issues are not well studied in the Region, making it difficult to assess the relative impact of unsafe food on poor and non-poor communities (see Box 27).

Overall, however, it has been well established that a polluted environment, lack of safe water supply and poor sanitation increase the likelihood of food contamination. A study in Thailand, for example, established a significant correlation between the risk of shigellosis, low socioeconomic status and faulty hygiene behaviours, such as not regularly washing hands, having an unclean environment surrounding the household, not having water to flush the toilet, and having a high density of flies in the kitchen. In general, poorer households are likely to be more vulnerable to the effects of unsafe food (from production to consumption) because they are less able to adopt protective technologies, such as refrigeration and adequate clean water, owing to their lower income and generally more limited knowledge and education. Lower levels of education can hinder one’s ability to read warning labels or access safety information disseminated in print media, for example. In addition, poor populations often live in the most polluted areas, where it can be difficult to apply basic hygiene standards and practices. In many countries, poor households purchase food from street vendors because it is readily available and at a relatively low cost. For households that lack access to refrigeration, clean water and adequate cooking facilities, street food can be a relatively cheap and convenient alternative to food prepared in the home. The issue of street food is discussed in more detail in later sections.

Overall, data on the burden of foodborne illness in the Region remain limited. Similarly, evidence on how the prevalence of unsafe food may affect poor households as compared with those that are better-off, or men compared to women, is scarce. Notwithstanding the data limitations, issues related to safe food and poverty are discussed in the following sections, where possible.

**Inequalities in geographical access**

In many countries, urban areas are often favoured over rural areas in public resource allocation. This pattern is mirrored in the way resources are allocated for improved water and sanitation. For example, 60% of investments in improved water and sanitation in Nepal benefit an estimated 6% of the population, who largely reside in the Kathmandu valley. This tendency can lead to skewed development, with poverty falling more slowly in rural areas. In 1999, for example, the three richest metropolises in China—Shanghai, Beijing and Tianjin—dominated the top of the country’s HDI ranking, while the bottom comprised rural provinces from the western part of the country. Throughout the Region, poor households are concentrated largely in rural areas. In Cambodia, 90% of the poor reside in rural areas, while 94% and 74% of the poor in the Philippines and Viet Nam live in rural areas, respectively. An estimated 80% of the population in Vanuatu subsists in rural areas. The poverty rate in the Lao People’s Democratic Republic is estimated at 27% in urban areas, while it is 41% in rural areas.

Globally, access to improved water and sanitation is almost always significantly higher in urban areas than in rural areas. The notable exceptions to this general rule are those industrialized countries that have achieved full coverage of improved drinking water and improved sanitation.

Inequalities between urban and rural areas in the Region are particularly striking. For example, 86% of the urban population in Vanuatu has access to improved water in comparison with 52% of the rural population. In Viet Nam, the proportion of the population without access to safe drinking water is only 1.2% in Ho Chi Minh City; however,
in Dong Thap, a rural province with a lower level of development than Ho Chi Minh City, 86.6% of the population is without access. More generally, the coverage of improved drinking water in rural areas of Viet Nam is 59%, compared with 90% in urban areas. The percentage of households with piped water or a protected well in the Lao People’s Democratic Republic ranges from 77% in urban areas to 45% in rural areas. In 2002, 66% of the rural population in Mongolia used water from unprotected sources; only 9% of the urban population relied on unprotected sources for their water. Moreover, in urban areas of Mongolia, access to piped water from a central source is associated with higher income: 25% of the poor and 50% of the non-poor have access to piped water. This is a particular problem among urban settlements. Figure 11 shows the urban-rural gap in access to an improved drinking water source in selected countries in the Region.

Urban-rural inequalities are especially stark for the coverage of improved sanitation facilities, as seen in Figure 12. Significant differences in the coverage of improved sanitation between rural areas/outer islands and urban areas are found in many Pacific island countries. In Solomon Islands, for example, improved sanitation facilities reach 98% of the urban population, compared to only 18% of the rural population.

Similarly, food safety challenges may be more acute in rural areas than in urban areas. Safe food consumption practices may be constrained in rural areas for a number of reasons, such as generally lower levels of access to water and electricity, both of which are necessary for refrigeration. Agricultural and livestock production, generally concentrated in rural areas, may expose rural households to pathogens from crops, vegetables or fruits, or to zoonotic infections from livestock.
What are the links between safe food, clean water, adequate sanitation and poverty and gender?

Some agricultural practices, which are often more prevalent in poorer households, can increase the risk of contamination by *Salmonella* and *E. coli* through all stages of food handling. These practices include the use of manure rather than chemical fertilizer, untreated sewage, contaminated irrigation and surface run-off water, and contaminated wastewater. For example, studies have shown that irrigation with polluted water or inadequately treated wastewater can result in the presence of pathogens on raw vegetables or fruits.48

**Urban poor communities:** Although the majority of people who lack access to improved water and sanitation live in rural areas in developing countries, a significant and rapidly rising number of urban households are also without such access.49 As of 2007, the global population has become predominantly urban and rates of urbanization are increasing in many countries.50 Figure 13 shows...
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Module on Water, Sanitation and Food

Box 7: Ethnicity and inequalities in access to improved water and sanitation

In the Western Pacific Region, income poverty often overlaps and reinforces social exclusion based on ethnicity. The social exclusion of ethnic minorities in the Region is reflected in their concentration in rural, remote and isolated areas and their over-representation among the poor. For example, the 1999 census showed that although ethnic minorities in Viet Nam accounted for 14% of the total population, they represented 29% of the population living below the national poverty line. Further, ethnic minorities in Viet Nam must cope with isolation (an estimated 75% live in mountainous areas), limited participation in government structures and public life, low levels of education and poor health outcomes. In the Philippines, the incidence of poverty is highest in the Autonomous Region of Muslim Mindanao, a predominantly Muslim region.

Disparities in access to clean water and adequate sanitation mirror the general exclusion of ethnic minorities in the Region from a proportionate share of the benefits of development. For example, the proportion of households with access to safe water in the Philippines ranges from 97% on the island of Luzon, the largest and most economically and politically important island in the Philippines, to 29% in the Autonomous Region of Muslim Mindanao. In China, improvements in the coverage of safe drinking water have progressed more rapidly in urban and coastal areas than in rural areas and those populated by minority groups.

Analysis of household data in Viet Nam revealed that coverage of clean water was 32% in the 12 least developed provinces, as compared with 97% in the most developed provinces. Coverage of improved sanitation was 12% and 75%, respectively. The study noted that the 12 least developed provinces were predominantly remote and mountainous, with large concentrations of ethnic minorities. Overall, the analysis concluded that ethnic minorities in Viet Nam have benefited less from investments in improved water and sanitation than the Kinh majority. From 1993 to 2002, the gap between ethnic minorities and the Kinh majority, in terms of proportion of population with access to clean water, has almost doubled. In 2002, an estimated 87% of ethnic minorities lacked access to clean water.


the level of urbanization for selected countries in the Region from 1985 to 2005. At the same time, a growing proportion of the world’s poor lives in cities. An estimated 43% of the urban population in developing countries lives in slums or urban poor communities. Currently, China and the Philippines are among the 10 countries with the largest numbers of slum dwellers worldwide.

In many countries, urbanization is viewed as a largely unwelcome phenomenon and few cities provide adequate services to their growing populations, particularly the poor. In urban areas, water is often delivered by a water utility through an extensive network of pipes. This type of formal water system can be the least expensive and most effective method for delivering water to large numbers of users. However, as the analysis above shows, poorer households are less likely to be connected to safe water sources than those that are better-off because, over time, investment levels have not always kept pace with rapid urbanization and growth of urban poor communities. In many cities, migration of rural people to cities has led to the formation of unplanned, peri-urban shanty towns, which often lack access to drinking water and sanitation. In these areas, water utilities may not offer connections to households that lack formal property titles.

For example, the centralized sewer system in Metro Manila covers 20% of the population, while 60% of the population is directly connected to the central water system. In other urban areas in the Philippines, the proportion of the population connected to the central water utility drops to 47%. Data from 1992 suggest that roughly 70% of households living in squatter communities in Metro Manila had no means of accessing clean water other than purchasing it at a public faucet.
What are the links between safe food, clean water, adequate sanitation and poverty and gender?

More recent estimates show that 4 million people in Metro Manila, comprising about 40% of the city’s population, obtain their water through kiosks, pushcart vendors or tanker deliveries. Similarly, in Mongolia, ger residents in urban areas have severely limited access to improved water and sanitation. In urban areas, 50% of non-poor households have access to piped water from a central source, compared with only 25% of poor households. Poorer residents must fetch water from sources outside their gers, which are often located at substantial distances. In India, a community survey revealed a ratio of 800 people per toilet in Dharavi, one of Mumbai’s largest slums.

The food available in urban poor communities is often of poor quality. Food is often purchased from local suppliers because access to central markets—sources of cheap, varied and nutritional foodstuffs—can be difficult. While the impact of restricted access to central markets on poor populations has not been fully studied, it has been identified as a core element of poor nutritional outcomes among low-class households in developed countries. Many urban poor households lack the time, suitable facility and access to fuel to permit the adequate preparation of safe food. Among children (3–37 months) living in urban slum settlements, risk factors observed for diarrhoeal frequency and duration include lack of maternal hygiene in cooking and in child-feeding practices, e.g. administration of contaminated and diluted cow’s milk.

Low coverage levels of improved drinking water and sanitation and the low quality of food available in urban poor communities will likely become more pressing concerns in many countries in the Region as population growth and rapid urbanization lead to growing numbers of people living in these communities.

**Inequalities in the prices of clean water, adequate sanitation and safe food**

Many countries have historically depended upon utilities to provide access to clean water and adequate sanitation to their populations. Often, these utilities were financed through public investments with tariff systems that encouraged universal access. In most cities, a household connection to a water utility is by far the cheapest method for accessing clean water (as measured by unit price), due to a combination of the low cost of delivering additional units of water once the network is established and the tendency for water utilities to receive subsidies. Yet, in many cases, these benefits do not reach poor households. The sewage utility networks tend to be even more limited than those for water utilities.

Besides the geographical barriers discussed above, the pricing systems adopted by many water utilities may limit the access of poor households to such connections. Few poor households can afford more than a minimal connection fee. Yet, in some settings, this fee can exceed US$ 100. In Metro Manila, Philippines, the fee for connecting to the water utility is equivalent to approximately three months’ income for the poorest 20% of households.

The pricing policies of water utilities can add to the problem. The “rising block tariff” system is an increasingly popular pricing method. This method charges progressively higher rates as the volume of water used rises. While in principle this pricing system combines equity with efficiency goals, in practice, poor households that are not connected to water utilities are often forced to pay much higher prices for water supplied by a multitude of other improved and unimproved sources. For example, vendors or other intermediaries serving poor households buy water in bulk at the highest rate and then pass on the extra charges to their customers. Estimates suggest that urban poor communities in Asian cities pay 20 to 40 times more for water per litre than users connected to water utilities. The same estimates suggest that water vendors distribute up to one quarter of the total volume of water in the cities and generate as much as three quarters of the total revenue.

Research shows that in Dhaka, Bangladesh, for example, households that use standpipes pay 3.5 times more than low-income families connected to the water network. In Metro Manila, Philippines,
Integrating Poverty and Gender into Health Programmes: A Sourcebook for Health Professionals

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urban poor households that are not connected to the water utility spend roughly US$ 15 per month on water, while households directly connected to the water utility pay on average US$ 5, per month yet the latter consume five times more water than their urban poor counterparts. In Pune, India, low-income households that purchased water from vendors were found to pay up to 30 times more than middle- and high-income households that paid for metered water.

Analysts argue that poor households tend to pay a relatively higher price for water than better-off households because of the frequently greater distances of poor households from the central utility. In urban areas, transportation into slums or informal settlements can be costly; transporting water into peri-urban communities can also be expensive. Rugged terrain and long distances have been found to increase the price of delivering water in rural areas. In both rural and urban areas, vendors reach unconnected poor households by purchasing water from the utility and reselling it through a network of intermediaries. The price of water has been found to rise with the number of intermediaries that link a household to the main water source: the price rises as each seller adds a profit margin.

In some poor areas, the cost of water amounts to more than 20% of household income. In 2000, poor households in the Philippines, on average, have been found to allocate 9% of their monthly expenditure to vended water, while wealthier households spend 5%. In Jakarta, Indonesia, over 40% of households surveyed spent 5% or more of their income on water.

The cheapest method for accessing water may not be the cheapest method for disposing of faeces. As argued above, in many contexts, water utilities’ network of pipes is usually the most cost-effective method for supplying clean water to households. However, in the case of sanitation, open defecation or defecating into a plastic bag and disposing of it as solid waste is often far cheaper than a network of pipes. The costs of other forms of adequate sanitation may likewise be out of the reach of poor households.

Table 5: Type of sanitation facility by cost

<table>
<thead>
<tr>
<th>Type of sanitation facility</th>
<th>Cost of facility per household (US$)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>A water closet connected to a sewer or septic tank within each home plus piped water to the home for personal hygiene</td>
<td>400–1500</td>
<td>Unit costs rise markedly if provision is made for sewage treatment using conventional treatment plants and with high level of treatment.</td>
</tr>
<tr>
<td>Condominial sewers</td>
<td>40–300</td>
<td>With high densities and strong community organization and input, unit costs per household can compete with those of pit latrines.</td>
</tr>
<tr>
<td>An ‘improved’ latrine or pour-flush toilet within each home</td>
<td>40–260</td>
<td>No need for sewer. These control odour better than conventional pit latrines and limit or prevent insect access to excreta.</td>
</tr>
<tr>
<td>A basic latrine</td>
<td>10–50</td>
<td>No need for sewers. If well managed, it can be as healthy as more expensive options; unit costs may be lower than US$ 10 in some rural contexts.</td>
</tr>
<tr>
<td>A public or communal toilet/ latrine (assuming 50 people to each toilet)</td>
<td>12–40</td>
<td>Effectiveness depends on whether it is close to its users, safe to use at night, well maintained and affordable to the poorest groups.</td>
</tr>
<tr>
<td>Open defecation or defecation into waste materials</td>
<td>0</td>
<td>Numerous health problems are associated with this method.</td>
</tr>
</tbody>
</table>

20 days to purchase a simple pit latrine. Table 5 outlines the costs associated with different forms of sanitation.

Few urban poor areas enjoy easy access to central food markets due to the limited availability of affordable public transportation. Instead, many urban poor households purchase their food from local shops in small quantities and at high prices. The ability of many urban poor households to respond to changes in food prices is limited because their income is dedicated to meeting other basic needs, such as transportation to work and housing, the costs of which are largely fixed, or to sending remittances to relatives in rural areas. This means that the remaining budget for food must be stretched further when food prices rise.

In addition, rapidly rising global food prices erode the ability of poor households to purchase varied and nutritious foods. Poor households may also be forced to stretch their food supply over multiple meals, which may increase the risk of food hazards, as many poor households lack appropriate storage and cooking facilities.

**Inequalities in water use**

People in developed countries use an estimated 30–50 times more water than people in developing countries. In high-income areas in the Region, men, women, boys and girls enjoy access to several hundreds of litres of water that are delivered into their households on a daily basis at a low price by public utilities. In contrast, individuals residing in urban poor communities or rural areas tend to have access to far less than 20 litres a day, which is the minimum estimated amount needed to meet a person’s basic needs. Notably, households that lack access to clean water tend to use roughly 5 litres per person a day. In Mumbai, India, per capita water usage has been estimated to be 15 times higher among high-income areas linked to water utilities than in slum areas. An average apartment dweller in Ulaanbaatar, Mongolia, uses 240 to 450 litres of water a day, compared to 8 to 10 litres used by ger dwellers. Besides water availability, studies show that distance and time also influence water use. In general, the further the water source is from the home and the longer it takes to collect water, the less water is used.

Poor households depend on a range of improved and unimproved sources to meet their water and sanitation needs. Among the poor, household members, usually women and girls, must travel long distances and/or devote a lot of time to fetching water. The amount of time required to collect water can vary significantly between rainy and dry seasons. In urban areas, though water sources may be located in close proximity to houses, the time required to collect the water may still be significant because of the paucity of water points or availability relative to the population served. For example, a study of squatter communities in Metro Manila found that, on average, household members spent between three and seven hours a day collecting water at public faucets.

Research shows that once the time needed to collect water exceeds roughly five minutes or the distance exceeds 10 metres, the quantity of water a household collects falls dramatically (Figure 14). After reaching this threshold, the amount of water collected remains largely constant until 30 minutes (or 1 kilometre), when it falls further to the bare minimum required for consumption.

Evidence from other studies shows that the quantity of water used is highest among households...
with piped-in water that is available through multiple taps. The amount of water used by these households is significantly higher than that used by households with water taps on their plots of land. For example, a study in Uganda observed that households with water piped into their homes used 155 litres per capita per day as compared to 50 litres among households with a tap in their yard. A similar relationship was observed in the amount of water used for consumption, bathing (including hand-washing), laundry and washing dishes among households in East Asia.82

In many cities in the Region, water is available only intermittently. For example, while Bangkok and Beijing enjoy 24-hour water supply, water is available for an estimated 12 hours per day in Phnom Penh and 18 hours in Manila.83 Many secondary cities in the Lao People’s Democratic Republic do not have a continuous supply of water and the water systems lack the pressure required to service the entire network. In addition, some distribution networks are in decay or disrepair.84 Roughly 1% of households connected to the water supply system in Delhi enjoy 24-hour service.85 People without access to water sometimes use illegal connections to tap into municipal water pipes. If many of these connections are made, water may be scarce for paying customers located further along the pipeline.86 Households with irregular water supply may store water in and around the house, although households in urban poor communities may not have sufficient space to store adequate amounts of water, while rural poor household may lack the needed storage containers or equipment.

Box 8 discusses the inequalities in the use of clean water, adequate sanitation and safe food associated with emergencies and disasters, as these events pose unique challenges.

<table>
<thead>
<tr>
<th>Box 8: Safe water, safe food, hygiene and sanitation in emergencies and disasters</th>
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</table>

People exposed to emergencies and disasters, refugees and residents of resettled communities are particularly vulnerable to water-, food- and fuel-poverty because of the lack of, or breakdown in, infrastructure elements, such as the provision of electricity, water supply and sanitation services. Further, when consumers are malnourished or immuno-compromised, which often happens when people are displaced or become refugees, they become more susceptible to disease. The resultant illness may also be more severe.

After a natural disaster, such as a flood, hurricane, cyclone or earthquake, raw materials may become contaminated with bacteria, viruses or parasites carried in water, which itself may be contaminated with human and animal faeces. In addition, after heavy rainfall or flooding, the soil releases many pathogens into groundwater and run-off. As a result, food may become contaminated with soilborne pathogens such as *Bacillus* and *Clostridium*. Dead animals and human bodies resulting from the disaster or emergency may also contaminate waterways, the water supply, and subsequently food, with a variety of pathogens. In a disaster situation, it cannot not be assumed that water is safe to use in food production, even if it is piped water normally considered potable. Damage to pipes, leakage of contaminated water into pipes and failure of disinfection units are all possibilities.

While the risk of contamination will vary from situation to situation, health workers must assume the presence of hazards. By undertaking a timely hazard analysis, health workers can identify and implement appropriate control measures, where necessary. The analysis will include an evaluation of whether a food is salvageable or not. Foods are classified as salvageable when they have been damaged, but the nature of the damage is such that the safety of the food is not jeopardized and/or the food can be rendered safe through remedial action. Foods are considered non-salvageable if they are likely to have unacceptable levels of contamination with microbiological, chemical or physical hazards and cannot be rendered safe; they should therefore be destroyed.

What are the links between safe food, clean water, adequate sanitation and poverty and gender?

Limited knowledge and education

Key factors in the prevalence of foodborne illnesses are the lack of knowledge on the part of food handlers or consumers and negligence in hygiene and safe food handling. Studies confirm that basic hygiene knowledge has a positive effect on hygienic practices and thereby on reducing the incidence of food-associated illnesses. In a study in the Philippines, improved water had the greatest impact for families with good sanitary conditions; improved drinking water had no effect on neighbourhoods with poor sanitation. Furthermore, hygienic practices go hand-in-hand with sanitation and water supply. Hand-washing at critical times (after defecation, before handling food, before eating and after handling children’s faeces) can reduce diarrhoeal episodes by up to 33%. Experts have identified three key hygiene behaviours to reduce diseases caused by lack of safe water and sanitation: (1) hand-washing with soap (or ash or other aid); (2) safe disposal of children’s faeces; and (3) safe water handling and storage. To accomplish these tasks, families need a sufficient amount of water to wash hands and clean food and utensils.

Proper hygiene practices can increase the benefits derived from access to improved water and sanitation, and can also, in some instances, enable households that lack access to improved water sources and sanitation to protect themselves from food- and water-related hazards and diseases. Estimates suggest that improved hand-washing may reduce by up to 35% the number of diarrhoeal cases globally. However, poorer households may have more limited knowledge or awareness of such healthy practices than their better-off counterparts.

Higher income has been found to be associated with better sanitation practices in developing countries. In poor households, knowledge can make the difference between taking advantage of piped water to wash hands and not doing so. In this manner, piped water has been found to have a larger impact on the prevalence of diarrhoea among children in better-off and educated households than among children in poorer, less-educated households. Education, specifically health-related knowledge and awareness, has been shown to contribute to better sanitary practices, among other measures that improve health outcomes. In many countries in the Region, however, educational attainment is positively associated with socioeconomic status, including level of income and housing conditions. Literacy rates also tend to be lower among ethnic minorities, compared to the general population (Table 6).

<table>
<thead>
<tr>
<th>Ethnic minorities</th>
<th></th>
<th>Total population</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
<td>Total</td>
<td>Female</td>
</tr>
<tr>
<td>Cambodia</td>
<td>17</td>
<td>26</td>
<td>55</td>
</tr>
<tr>
<td>Lao People's Democratic Republic</td>
<td>17</td>
<td>33</td>
<td>48</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>73</td>
<td>86</td>
<td>92</td>
</tr>
</tbody>
</table>

Notes: Literacy rates in Cambodia are calculated for people who are seven years and older. Literacy rates for ethnic minorities are determined for the provinces of Mondolkiri and Ratanakiri, which are 67% ethnic minority (1998 census). Literacy rates for ethnic minorities in the Lao People's Democratic Republic cover non-Lao-Phutai speakers (1995 census). Literacy rates in Viet Nam are for people over age 10 (1997–98 Viet Nam Living Standards Survey).

As a consequence, their capacity to read and understand public food safety messages and safety instructions, such as those on fertilizer products used by farmers, may be limited. This can result in unsafe food handling practices.

Knowledge of hygiene practices and the risks related to water, sanitation and food might be lower among poor households for several reasons. First, health communication materials for water, food and sanitation might not reach poor people. Second, illiterate people and those with low levels of education might be unable to understand written health education materials, such as posters and flyers. Third, poor households might not have access to newspapers or television, thereby missing health messages disseminated through these types of mass media. Among these households, women and ethnic minorities might have even less access to mass media: women tend to be less educated and literate than men, while people from ethnic minority groups may have only limited command of the majority language. Thus, although health information on the risks associated with water, sanitation and food and proper hygiene practices might be available in health centres and within villages, such information might not benefit poor and marginalized groups. Health education delivered through outreach workers likewise might not reach poor households in remote rural villages.

Even if members of poor households are aware of proper hygiene methods, they often lack sufficient quantities of water, detergent or soap to carry out hygienic practices. Research shows that poor hygiene may be caused, at least in part, by a lack of access to sufficient quantities of water. Lower water availability means there is less water for hygiene (hand-washing, cleaning surfaces, utensils and foods) and for cooking foods frequently.

**Urban poverty and street-vended food**

In urban and peri-urban areas in developing countries, selling food on the street is an important source of livelihood for many poor households. Street-vended food is also a key source of nutrition for those who cannot afford to either prepare food in their homes or eat in more elaborate food service establishments. Thus the vending of street food can improve the economic status of the sellers, many of whom belong to the poorer, less literate, less formally educated sections of the community, but also contribute to disease when proper hygiene practices are not followed.

A 1993 WHO-supported survey of more than 100 countries represents the most extensive report...
What are the links between safe food, clean water, adequate sanitation and poverty and gender?

The survey found a wide variety of arrangements with respect to the foods sold, types of preparation, facilities and infrastructure. Countries from all WHO regions reported street-vended foods to be a significant part of both the urban and rural food supply. However, reliance on such foods was clearly greater in urban areas (Figure 15) and less overall in the Eastern Mediterranean and European Regions.

Infrastructure availability for street food vending (Figure 16) was relatively limited, with restricted access to potable water, toilets (15%), refrigeration equipment, and hand-washing and waste disposal facilities. In less than 50% of countries, potable water was considered a facility normally available to street food vendors. In Africa and South-East Asia, only 30%–40% of countries reported potable water being available for street food preparation and vending.

Refrigeration was a facility normally not available in more than half of the countries participating in the survey. In Africa, less than 10% of respondents considered it to be normally available to street food vendors. While access to washing facilities was generally limited, South-East Asian countries appeared to be worse off than those in other regions.

Limited access to improved water and sanitation and safe food can lead to poverty and force already poor people into deeper poverty. Poverty affects people’s capacity to protect themselves from disease, and the poor are already ill-equipped to cope with the health impacts of reduced access to clean water, adequate sanitation and safe food.

The influence of reduced access to clean water, adequate sanitation and safe food on poverty

<table>
<thead>
<tr>
<th>Lack of safe, water, sanitation and proper hygiene</th>
<th>Poverty dimensions</th>
<th>Key effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>Water, food, sanitation and hygiene-related illnesses</td>
<td>• Water, food, sanitation and hygiene-related illnesses</td>
</tr>
<tr>
<td></td>
<td>Stunting from diarrhoea-caused malnutrition</td>
<td>• Stunting from diarrhoea-caused malnutrition</td>
</tr>
<tr>
<td></td>
<td>Reduced life expectancy</td>
<td>• Reduced life expectancy</td>
</tr>
<tr>
<td>Education</td>
<td>Reduced school attendance by children (especially girls) due to ill health, lack of available sanitation, water and/or fuel collection duties</td>
<td>• Reduced school attendance by children (especially girls) due to ill health, lack of available sanitation, water and/or fuel collection duties</td>
</tr>
<tr>
<td>Gender and social inclusion</td>
<td>Burden borne disproportionately by women, thus limiting their entry into cash economy</td>
<td>• Burden borne disproportionately by women, thus limiting their entry into cash economy</td>
</tr>
<tr>
<td></td>
<td>Pregnant women at greater risk from certain foodborne diseases</td>
<td>• Pregnant women at greater risk from certain foodborne diseases</td>
</tr>
<tr>
<td>Income and consumption</td>
<td>High proportion of budget used on food and water</td>
<td>• High proportion of budget used on food and water</td>
</tr>
<tr>
<td></td>
<td>Less access to fuel and water</td>
<td>• Less access to fuel and water</td>
</tr>
<tr>
<td></td>
<td>Reduced income earning due to ill health, time spent collecting fuel and/or water, and time spent cooking food</td>
<td>• Reduced income earning due to ill health, time spent collecting fuel and/or water, and time spent cooking food</td>
</tr>
<tr>
<td></td>
<td>High consumption risk due to seasonal and other factors</td>
<td>• High consumption risk due to seasonal and other factors</td>
</tr>
</tbody>
</table>

poor households into further destitution, through a number of pathways. Figure 17 summarizes the links between poverty, food, water, sanitation and hygiene.\(^9\)

As discussed earlier, access to improved water and sanitation and safe food protects men and women, boys and girls from water- and food-related hazards and diseases. WHO estimates that ingestion of unsafe water, inadequate water for hygiene and lack of sanitation account for 88% of the 1.8 million deaths from diarrhoeal diseases annually. An estimated 90% of these deaths occur among children under five years.\(^9\) Within the Region, however, since diarrhoea is not a reportable illness in some countries, determining the accuracy of these estimates poses a challenge.\(^9\)

Evidence indicates that diarrhoeal diseases and many other water- and food-related diseases are concentrated among poor populations, partly because of the inequalities in access to safe water, adequate sanitation and safe food discussed above. As a result, poor households are more likely to suffer from water- and food-related morbidity and mortality than better-off households. These negative health outcomes are compounded by the inability of the poor to shield themselves from these risks through the consumption of appropriate goods and services.

Periods of ill-health can further impoverish already poor households. The costs associated with ill health, e.g. payments for health care or medication or time away from work or other income-generating activities, weigh heavily upon poor households. Estimates show that in 1998, the average user charge per admission for inpatient care in a public hospital in Viet Nam was equivalent to 45% of the average non-food expenditure for households in the poorest income quintile and 4% for those in the richest quintile.\(^1\) Households in Vientiane, Lao People’s Democratic Republic, spend 1.8% of household expenditure on medical care, while those in the southern and northern regions of the country, which are predominately rural and poorer than those in Vientiane, spend 2.6% and 2.5%, respectively.\(^3\)

Further, time spent collecting water diverts household members from other productive activities and, for children, educational opportunities. Since women and girls are largely responsible for such activities, the negative effects of limited access to water and sanitation fall more heavily on them than on boys and men in the same household. Gendered impacts such as these are discussed in more depth in the next section.

When aggregated to the national level, the costs of disease and productivity losses related to water and sanitation in developing countries can be significant. Based on recent calculations, these costs are equal to roughly 2% of GDP. In sub-Saharan Africa, this estimate rises to 5% of GDP.\(^5\) Other studies have found that the costs of inadequate water management in developing countries are US$ 34 million for households and US$ 7 billion for health systems.\(^5\)

**Investments in water and sanitation are effective for poverty reduction**

Recent estimates suggest that 9% of the global burden of disease could be prevented by better management of drinking water and sanitation, in addition to improved hygiene practices.\(^6\) Evidence concludes that investments in safe water, adequate sanitation and safe food are cost-effective at both the household and country levels. For example, an eight-country study found that, when households with no sanitation moved from having no improved water source to having an “optimal” water source, they experienced a 6% reduction in the prevalence of diarrhoea in children under three years old (from a base of 25%). Similarly, households with no improved water source, moving from having no sanitation to having “optimal” sanitation, experienced a 10% drop in recent cases of diarrhoea.\(^7\) Interventions to reduce diarrhoeal disease have been found to be cost-effective in developing countries.\(^8\) An analysis of the 1992 China National Health Survey suggests that, in rural China, policies designed to achieve universal access to safe drinking water would make the most significant contribution to reducing under-five mortality.\(^9\) The analysis also
suggests that poor households and communities would derive greater benefits from improved access to safe drinking water than non-poor household and communities.

**Gender and water, sanitation and food**

*The effect of gender on access to clean water, improved sanitation and safe food*

Across countries, men and women are responsible for different social and economic activities, and enjoy different access to resources and decision-making authority. These differences arise from the socially constructed notion of gender. Box 9 discusses how gender is defined in this module. Importantly, as gender roles are socially constructed, they tend to vary across societies and over time. Further, gender interacts with other social factors, such as class or ethnicity, resulting in differences in the gender roles and status of men and women across social groups.

Women's experience of poverty is shaped by locally constructed gender roles, and poverty has been identified as a key determinant of women's health. For example, an estimated two thirds of the illiterate adult population are women and, although women often live longer than men, they are sick and disabled more often. Local notions of masculinity and femininity tend to shape men's and women's economic and productive capabilities, social roles and decision-making opportunities. These aspects of gender inequality are central to understanding how men and women have differing experiences with respect to access to and use of safe water, adequate sanitation and safe food. These are analysed in more detail below.

**Gender roles and the gender-based division of labour**

The social norms that ascribe gender roles to men and women usually give rise to a clear division between the activities, tasks and responsibilities of men as compared with women. This demarcation is known as the gender-based division of labour. In many societies, men are primarily responsible for productive work, while women are assigned both production- and reproduction-related tasks. Worldwide, women carry a double burden by combining productive and reproductive activities, such as childrearing and other household duties. Although the gender-based division of labour may be expressed differently across societies, this pattern tends to extend from the household to the public sphere and be reproduced within larger social institutions, too, with an over-representation of women among caring professions, such as health care and teaching in some countries, for example. This further reinforces gender-based divisions in society, thereby creating a recurring cycle.

In contrast to productive work, reproductive work consists of all household responsibilities, caregiving and nutrition-related work that are required to keep people alive. These tasks include breastfeeding, raising children, taking care of domestic tasks such as cleaning and cooking, feeding household members and animals, caring for the sick and elderly, watering the garden.

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**Box 9: Defining gender**

Gender refers to the differences and inequalities in the situations and needs of men and women that are based, not on biological differences, but on societal understanding of being male or female. Gender dynamics are understood as the different roles, expectations, identities, needs, opportunities and obstacles that society assigns to women and men based on sex. While sex is biologically determined, gender is socially ascribed. It determines how individuals and society perceive what it means to be male or female and influences how roles, attitudes, behaviours and relationships are enacted. While girls and boys, women and men, may have the same rights, potential and capacities, discrimination against girls and women based on socio-cultural norms often relegates them to lower status and value. This often places them at a considerable disadvantage with respect to access to resources and goods, decision-making power, choices and opportunities across all spheres of life.
collecting fuel and sewing, and many others. In poorer communities, much of reproductive work is labour-intensive and time-consuming. These tasks are predominantly carried out by women and girls. This is illustrated by the findings of a time-use survey from Mongolia that reports the share of time men and women spent on paid and unpaid activities in 2000 (Table 7). In this study, compared with men, women spent significantly more hours on unpaid work or household maintenance, shopping and management, and caring for children, elders and other family members. Focus group discussions in Cambodia revealed that Cambodian gender norms discourage men from performing household tasks. When men engage in such activities, they seek to ensure that their neighbours do not see them.112

Water, sanitation and food are closely tied to reproductive work. For example, women and girls are usually assigned the primary role in collecting, storing, managing and using household water. In areas without piped water or home-based wells, water collection alone can take hours. For example, a study carried out in the semi-arid state of Gujarat, India, found that women spend three to four hours a day, on average, collecting water. The duration increased by two hours during the summer months.113 In Nepal, women were found to collect a total of 80 litres of water four or five times a day. When an improved water source became available closer to their homes, women reported that they began collecting water 10–15 times a day, which was equivalent to 200–300 litres per day.114 Collecting water is hard physical work. Under normal circumstances, hauling water can use up 12% of a woman’s energy intake; if the water source is far from the home, or in a mountainous area, it can use as much as 25%.115

Hauling water over long distances can lead to back and neck problems. Travelling to remote water holes can also put women and girls at risk of harassment and assault.116 Among their other reproductive or household tasks, women and girls are usually responsible for food handling and preparation for household consumption. As this task is essential to household food safety, women are usually recognized as the main lines of defence against foodborne illnesses of their families.117 Women and girls are also typically responsible for collecting fuel for cooking and reheating food. Most households in developing countries burn unprocessed biomass fuels, such as dried animal dung, agricultural waste, wood or charcoal for cooking daily meals. As areas become deforested, the time that women and girls have to travel to collect firewood increases. Where fuel is scare or expensive, cooking times may be reduced to conserve unprocessed biomass fuels, thus increasing the risk of foodborne diseases. In addition, because women and girls are often responsible for many productive and reproductive tasks, they may lack the time to cook and reheat foods thoroughly.

As the major caregivers of children, women are responsible for cleaning children or clearing up their faeces. As the main food preparers as well as child handlers, women can spread disease if proper hand-washing is not a common practice. Lack of clean water can also limit hygienic childbirth techniques used by skilled birth attendants, which might otherwise increase protection from the likelihood of all infection-related deaths by 50%.118 Street food vending is a source of income for many women from low-income households in the

| Table 7: Percentage of time men and women spent on paid and unpaid work in Mongolia, 2000 |
|---------------------------------|-----|-----|-----|-----|
| Unpaid work | Urban areas | Rural areas | Urban areas | Rural areas |
| Men | Women | Men | Women |
| 37.9 | 54.3 | 86.6 | 89.5 |
| 62.1 | 45.7 | 13.4 | 10.5 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 |

What are the links between safe food, clean water, adequate sanitation and poverty and gender?

Region. Because food preparation is traditionally the responsibility of women, transforming this task into income-generating activity does not challenge the gender division of labour. Because street vending is part of the burgeoning informal sector, data on the number of street vendors in general, and women’s participation in particular, are scarce. However, studies from various countries have shown that large numbers of women are active in this sector. In the Philippines, for example, one study found that women in Iloilo owned or operated 63% of all street food enterprises. In addition to those elements of street vending discussed above, female street vendors are often vulnerable to exploitation and abuse because of the informal and often unregulated nature of the sector.

Gender norms

In many societies, strict gender norms control the behaviour of men and women with regard to hygiene. Limited access to safe, hygienic and private sanitation facilities can severely affect the dignity of women in these circumstances. For example, social norms may dictate that women should not be seen defecating. As a result, women and girls may venture out of the house to relieve themselves only after nightfall. This means that, unlike men, women may have to hold in their urine and faeces for many hours, a daily reality in the lives of many women, which can lead to complications such as urinary tract infections, chronic constipation and psychological stress. A case study in Nepal reported that when water sources were located along roads or in other public places, women might wait until night to bathe. Going out at night, often alone, also places women at risk of harassment, attack or rape.

Gender norms that control the cultural behaviour of women as mothers, sisters, daughters-in-law, wives and daughters, relative to men as fathers, husbands and sons, determine their access to sanitation, washing and bathing facilities. Issues of private and personal hygiene with regards to menstruation and pregnancy may be equal challenges. For example, in some societies, pregnant women are prohibited from using latrines. In others, daughters may not use the same latrine as their fathers or fathers-in-law after puberty. The social seclusion of women in many societies also prevents them from having access to public and communal facilities. Schools may not have facilities for menstruating girls or may expect girls to share latrines with boys, which may contravene existing gender norms. Thus, once they reach puberty, girls may be kept from schools if they lack facilities for basic sanitation and hygiene. Such problems are compounded in schools that lack water for hygiene and sanitation purposes.

Table 8: Street food enterprises, by women’s involvement (%)

<table>
<thead>
<tr>
<th>City</th>
<th>Owner or operator</th>
<th>Enterprise with female assistants</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Woman</td>
<td>Man</td>
</tr>
<tr>
<td>Bogor, Indonesia</td>
<td>16</td>
<td>60</td>
</tr>
<tr>
<td>Chonburi, Thailand</td>
<td>78</td>
<td>22</td>
</tr>
<tr>
<td>Ile-ife, Nigeria</td>
<td>94</td>
<td>6</td>
</tr>
<tr>
<td>Iloilo, Philippines</td>
<td>63</td>
<td>10</td>
</tr>
<tr>
<td>Kingston, Jamaica</td>
<td>44</td>
<td>46</td>
</tr>
<tr>
<td>Manikganj, Bangladesh</td>
<td>1</td>
<td>99</td>
</tr>
<tr>
<td>Minia, Egypt</td>
<td>17</td>
<td>83</td>
</tr>
<tr>
<td>Pune, India</td>
<td>13</td>
<td>87</td>
</tr>
<tr>
<td>Ziguinchor, Senegal</td>
<td>77</td>
<td>23</td>
</tr>
</tbody>
</table>

Gender-based inequalities in access to and control over resources

Gender analysis of the roles men and women traditionally hold in terms of water, sanitation and food preparation illustrates that while women typically use and manage the water, men usually make the decisions for water and sanitation programmes, investment, repair and maintenance, and sit on water users committees. Evidence from a number of countries demonstrates the importance that women assign to improved water and sanitary provision. For example, case studies in Cambodia, Indonesia and Viet Nam found that women were more likely than men to prioritize toilets, citing the benefits of privacy.129 However, in communities where men dominate decision-making and do not prioritize improved water and sanitation to the same degree as women, investments in these basic services may not be made.130

Gender-based inequalities in knowledge and information

Educational outcomes tend to be unevenly distributed among men and women in the Region. Education, and more specifically health-related knowledge and awareness, has been shown to contribute to better nutrition and child-feeding practices, better sanitary practices and increased usage of maternal and child health services.131

The gendered effects of limited access to clean water, adequate sanitation and safe food

The effects of limited access to clean water, adequate sanitation and safe food differ for men and women, boys and girls. These different effects arise from the interaction between the social construct of gender and biologically determined sex. Although the relationships between the biological and gender-related aspects of being...
male or female in a particular society may be complex, this section discusses how both affect health.

Gender-related roles and responsibilities expose women and girls to risks of waterborne and foodborne hazards and illnesses that are often quite distinct from those faced by men and boys. In most communities, women spend more time than men in and around water sources because of their responsibility for washing clothes and bathing children. In the Cordillera region of the Philippines, for example, women are responsible for planting the rice fields — a role that can lead to multiple back problems due to hours spent bending over and fungal infections caused by standing in water for extended periods. Such water-related domestic tasks may increase the exposure of women and girls to waterborne diseases, such as schistosomiasis, malaria and worms. For example, a study in rural China found that the prevalence of schistosomiasis was 10% among boys and 19% among girls. This difference was attributed to the fact that girls were more likely to engage in water-related domestic work, such as collecting grass in marshlands and harvesting wild vegetables along water embankments.

In addition, women and young girls who haul water or fuels for cooking or other household needs are at risk of fatigue, undernutrition (burning more energy than they take in), backache, arthritis, slipped discs, miscarriages, and having babies with low birth weight. When unprocessed biomass fuels are burnt on open fires or in inefficient stoves, women and girls, who are usually responsible for cooking, are exposed to high levels of indoor pollution. Exposure to coal smoke at home has been linked with lung cancer among women in China. Prolonged exposure to open stoves also increases the risk of burns among women and girls.

Young girls are given the task of either fetching and hauling water and fuel for cooking and other household needs, or carrying out other household chores, because water and fuel collection takes so much time of the household’s older women. As such, girls are often taken out of school, thereby limiting their opportunity for education. Dropping out of school can negatively affect the future welfare of the girls, as well as that of the next generation, since children of mothers with higher education levels have better nutritional status and lower death rates than children of mothers with lower education levels. The lack of adequate, separate sanitary facilities in schools has been found to be one of the main factors preventing girls from attending school, particularly when they are menstruating. In Bangladesh, for example, a school sanitation programme increased girls’ enrolment by 11%.

In addition, the time spent fetching water and fuel — in some communities, amounting to up to six hours — is time not spent producing food, engaging in income-generating activities, caring for children and feeding the family, among other productive and reproductive tasks. It also leaves women with little leisure time. For example, a study from Gujarat, India, concluded that a one-hour-a-day reduction in the time spent fetching water was associated with a woman’s ability to earn an additional US$ 100 a year in income, on average.

**Biological effects for women**

While gender-related factors may place women’s health at higher risk than men’s due to limited access to clean water, adequate sanitation and safe food, biological factors may also be at play. Evidence suggests that women are more vulnerable to chemical exposure than men because of differences in absorption, metabolism and excretion of fat soluble substances. For example, in Japan, cadmium poisoning caused by water pollution from a lead-zinc mine led to the discovery of the ‘itai-itai’ disease among women. Rice, irrigated with contaminated water and then eaten, caused women to suffer from bone fractures and pain. Epidemiological studies revealed that all the cases occurred in women. It is thought that women were more susceptible because calcium metabolism was affected; women had fewer calcium stores because of repeated pregnancies,
diets with less protein and minerals than men, and isolation inside the home when ill. Access to the sun and vitamin D could have lessened the damage from the cadmium.\textsuperscript{140}

Many of the effects of limited access to clean water, adequate sanitation and safe food that are related to women’s biological characteristics arise from the vulnerabilities women experience while pregnant. Often, infants \textit{in utero} are similarly vulnerable to such adverse effects. For example, pregnant women exposed to raw meat contaminated with \textit{Toxoplasma} (also found in cat faeces, contaminated vegetables and meat) are at risk for toxoplasmosis infection, which can cause vision and hearing impairment and mental retardation in newborn infants. Between 400 and 4000 cases of congenital toxoplasmosis occur in the United States of America each year.\textsuperscript{141} The organisms causing \textit{Listeria} infections can cross the placenta and infect the unborn fetus, resulting in a high fetus fatality rate. Pregnant women and their infants are especially vulnerable to mercury in certain foods. Advisory warnings about eating swordfish and shark have been issued for pregnant women in Australia, the United States and other countries.\textsuperscript{142} Hepatitis E is a virus transmitted by the faecal-oral route through contaminated water and food. While the overall case fatality of hepatitis E is 1\% to 3\%, the rate among pregnant women is 15\% to 25\%. 
3. Why is it important for health professionals to address poverty and gender concerns in water, sanitation and food?
3. Why is it important for health professionals to address poverty and gender concerns in water, sanitation and food?

The evidence presented in Section 2 suggests that current efforts to improve the coverage of clean water and adequate sanitation may not be reaching poor populations in urban and rural areas. Some evidence also suggests that initiatives to improve food safety may not be benefiting poor populations. Similarly, investments in water and sanitation services and initiatives to enhance food safety appear to benefit men and women differently. These disparities demonstrate the need for greater attention to poverty and gender concerns from health professionals in the Western Pacific Region.

For a number of reasons, it is important for health professionals to address poverty and gender concerns in their efforts to improve access to clean water, improved sanitation and safe food. Three rationales for this work – efficiency, equity and human rights – are presented below.

Efficiency

Many countries in the Region have made impressive gains in the coverage of improved water and sanitation and access to safe food. However, progress is slipping in some countries and millions

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**Box 10: Links between the other MDGs and improved access to clean water, adequate sanitation and safe food**

The Millennium Development Goals and targets are interrelated and reinforcing. For example, progress (or lack of progress) towards the water- and sanitation-related targets will support (or hinder) progress in other areas. Improved access to safe food can likewise support progress towards the MDGs. These links are explored briefly below.

**Goal 1: Eradicate extreme poverty and hunger.** Water- and food-related illnesses are a major cause of ill health and malnutrition, which results in lost productivity among poor households. Money spent on clean water, adequate sanitation and safe food can account for a significant share of household income, thereby leaving less income for productive investments.

**Goal 2: Achieve universal access to primary education.** The gender-based division of labour often demands that girls spend hours collecting water, which may keep them from school. Water- and food-related illness can also prevent children from attending school. Inadequate water and sanitation facilities in schools can deter children, especially girls, from attending school regularly.

**Goal 3: Promote gender equality and empower women.** Women currently bear the burden of collecting water and ensuring family food consumption and hygiene in difficult conditions. Women must also care for family members who are ill from water- and food-related diseases. Inadequate sanitation can be particularly difficult for women, who can experience shame and risk potential violence from defecating in open spaces.

**Goal 4: Reduce child mortality.** Water- and food-related hazards are a main cause of diarrhoea, which is the second leading cause of child mortality. Access to clean water and adequate sanitation—as well as safe food—can reduce the risk of childhood mortality by as much as 50%.

**Goal 5: Improve maternal health.** Access to clean water, adequate sanitation and safe food can reduce the risk of waterborne and foodborne disease during pregnancy. Adequate amounts of clean water during delivery can also reduce the risk of infection.

**Goal 6: Combat HIV/AIDS, malaria and other diseases.** Individuals infected with HIV are particularly vulnerable to waterborne and foodborne hazards. Poor sanitation and drainage can create breeding grounds for malaria-carrying mosquitoes.

Source: Adapted from United Nations Development Programme, 2006.
of people in the Region remain without secure and sustainable access to clean water and adequate sanitation. At the same time, the incidence of foodborne epidemics appears to be increasing, thus heightening concern about the safety of food, from production to consumption.

As discussed earlier, poor and marginalized populations are more likely to face conditions characterized by unimproved water, inadequate sanitation and unsafe food. Moreover, prevailing gender norms in the Region often result in a higher burden on women and girls, who are usually responsible for securing water, sanitation and safe food for all family members. Investments in improved water and sanitation have not always equally benefited poor populations, who tend to live beyond the reach of urban utilities and are unable to pay the costs of clean water and adequate sanitation.

Nonetheless, access to clean water, adequate sanitation and safe food are critical to human well-being. Clean water and adequate sanitation have been identified as integral to efforts to reduce the global burden of ill health, reduce poverty and improve education (Box 10). As such, innovative strategies are required to address poverty and gender-related concerns in water, sanitation and food. Tailoring the interventions to the needs of poor or otherwise socially excluded and marginalized populations can better ensure
that clean water, adequate sanitation and safe food reach these populations. This, in turn, can contribute significantly towards efforts to meet international health goals, including the MDGs. Figure 19 shows how lack of clean water, adequate sanitation and safe food interact and lead to reduced water consumption, increased sickness, reduced labour productivity and reduced income.

Targeting poor communities and households with simple and low-cost water and sanitation technologies has been demonstrated to be an effective means of reducing the burden of diarrhoea (Figure 20). Such communities also need to be targeted in implementing interventions to improve food safety. This could reduce the overall economic impact of water- and food-related burden of disease. Incorporating a gender-sensitive response could likewise ensure that men and women benefited equitably from such efforts. Together, these approaches could enhance the overall efficiency of efforts to improve access to clean water, adequate sanitation and safe food.

Indeed, a recent study that analysed the cost–benefit ratio for investments in water and sanitation concluded that all low-cost improvements in water supply and sanitation are cost-effective in developing countries. This study estimated a return of US$ 5 to US$ 36 on each dollar invested to reach the water supply and sanitation targets for the MDGs. Further, this study found that investments in sanitation have better returns than investments in water supply (US$ 9 compared with US$ 4, per US$ 1 invested), largely because improved sanitation has a greater impact on health outcomes, health costs savings and productivity benefits, as compared with water supply. For example, the number of diarrhoea cases worldwide would be reduced by 190 million if the MDG target for sanitation was met. In contrast, meeting the MDG water target would reduce the global burden of diarrhoea by 72 million.¹⁴³

The efficiency gains from effectively targeting poor men and women with interventions to improve access to clean water, adequate sanitation and safe food are even more significant when considering the central role clean water, adequate sanitation and safe food can play in poverty reduction strategies. Secure access to sustainable and affordable clean water sources and adequate sanitation, along with safe food, can advance the overall health and well-being of poor men and women, boys and girls. Strategies that recognize and address the constraints poor households face in accessing clean water, adequate sanitation and safe food can protect poor households from the impoverishing effects of ill health arising from waterborne and foodborne diseases. This can be particularly important for the health of children. These gains, when aggregated at the national level, can contribute towards improved economic growth and poverty reduction in the longer-term.

### Figure 20: Impact of water and sanitation interventions on diarrhoeal morbidity

![Figure 20: Impact of water and sanitation interventions on diarrhoeal morbidity](image)

**Equity**

Inequities refer to inequalities that are seen as unfair, unjust and avoidable (Box 11). Pursuing equity in water, sanitation and food is a commitment to increasing the opportunities for improved access to clean water, adequate sanitation and safe food and the associated gains in health and well-being among groups that are more vulnerable, or face discrimination and marginalization. Inequities in access to clean water, adequate sanitation and safe food between the poor and non-poor households and between men and women are increasingly understood to mirror social disadvantage, at least partially, such as that based on income, ethnicity or geographical location. That is, as the discussion above highlighted, many poor and marginalized individuals and groups in the Region do not have secure access to sustainable and affordable sources of clean water, adequate sanitation and safe food. As such, they tend to suffer a disproportionate burden of water- and food-related ill-health.

Access to clean water, adequate sanitation and safe food for all people in need, regardless of their socioeconomic status, is a matter of social justice, fairness and equity. Equity involves the distribution of well-being among social groups so that vulnerable, poor and marginalized people can enjoy secure access to sustainable and affordable clean water, adequate sanitation and safe food. In reality, considerable disparities exist in the coverage of improved water and sanitation supply between resource-poor nations and industrialized regions of the world. Furthermore, gender-based inequities interact with inequities by social class, race, caste or ethnicity, so that women face additional disadvantages compared to men from the same social group. Social justice and equity therefore require that inequities between men and women, the rich and poor, and disparities in the coverage of clean water, adequate sanitation and safe food between the developing and industrialized nations of the world be reduced.

**Human rights**

Human rights comprise an internationally agreed-upon set of principles and norms that are contained in treaties, conventions, declarations, resolutions and guidelines at the international and regional level. The right to the highest attainable standard of physical and mental health, or the right to health, is rooted in the Universal Declaration of Human Rights. International laws make governments accountable for their actions in planning and implementing public health policies and programmes. Active, free and meaningful participation of individuals is a key component of a rights-based approach.

International treaties and covenants are important because they help establish a ‘norm’ and because they set the framework for concrete action. Citizens can lobby their governments to pass national legislation to live up to their international commitments.

Water and food, as well as clean air, are essential for the survival of human beings and plant and animal life on this planet. In this truth lies the basis for the human rights argument. Human rights have often been interpreted in a limited sense, as referring to civil liberties and political freedoms. Yet since the 1948 Universal Declaration on Human Rights, various covenants and treaties have supported the view that human rights also include the right of all people to the basic necessities of life, without which we cannot reach our full potential.

The Convention on the Elimination of all Forms of Discrimination (CEDAW), adopted in 1979 by the United Nations General Assembly, was the first international treaty to identify gender discrimination as a breach of human rights and as an obstacle to adequate nutrition and health care.

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**Box 11: Defining equity in health**

Equity in health may be defined as the “absence of systematic disparities in health (or major social determinants) between groups with different levels of underlying social advantage or disadvantage, such as different positions in the social hierarchy.”

for women. The Convention on the Rights of the Child (1986 Article 24) was the first treaty that explicitly referred to access to water and sanitation as a basic human right. Prior to that, it was implied that access to water and sanitation was needed for the realization of an ‘adequate standard of living’ (Article 11 International Covenant on Economic, Social and Cultural Rights, 1966) or a ‘right to life’ (Article 6 International Covenant on Civil and Political Rights). In 1995, the Fourth World Conference on Women adopted the Beijing Declaration and Platform of Action, which goes even further to identify how gender discrimination affects women’s participation and opportunity in environmental resource development.

In 1983, an Expert Committee on Food Safety was convened by two international organizations with specific mandates in the field, WHO and the Food and Agriculture Organization (FAO) of the United Nations. The Expert Committee concluded that illness due to contaminated food is perhaps the most widespread health problem in the contemporary world and an important cause of reduced economic productivity. In spite of great efforts at the national and international levels, progress in combating foodborne disease has largely been offset by other global trends, including increasing population (especially in urban areas), growing consumer demand for foods of animal origin, longer food distribution networks and many basic changes in the way food is produced, transported, processed, prepared and consumed. The FAO/WHO International Conference on Nutrition (Rome, 1992) declared that “...access to nutritionally adequate and safe food is a right of each individual”. Seen from this perspective, food safety must be given higher priority by governments, industry and consumers themselves.

In recent years, there have been calls to make the right to water and sanitation more explicit because attempts to develop and improve access to water and sanitation have not reached international development targets. In fact, as cited earlier, access to sanitation in urban areas of the least developed countries actually decreased over the last decade (1990–2000). Poor programme design was partly to blame for the decline, e.g. a top–down, supply oriented approach, often involving large infrastructure projects focusing on engineering and technology that tend to serve the well-to-do and not the poor.

A human rights perspective embraces a belief in the capacity and ability of people to enlarge their own choices, given the necessary environment and assistance. A human rights-based approach to development therefore involves the empowerment of poor people to change their circumstances. Box 12 highlights several key reasons for linking water to human rights.

A rights-based approach to health also demands that governments put in place policies and plans that will make health services, including access to clean water, adequate sanitation and safe food, available and accessible, and will lead to the

<table>
<thead>
<tr>
<th>Box 12: Reasons for making the right to water an explicit human right</th>
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<tbody>
<tr>
<td>1. To pave the way for translating this right into specific national and international legal obligations and responsibilities.</td>
</tr>
<tr>
<td>2. To make the state of water management a focus of attention globally.</td>
</tr>
<tr>
<td>3. To enable the identification of minimum water requirements and allocations for all individuals, communities and nations; in turn, to focus attention on resolutions of international watershed disputes and conflicts over the use of water.</td>
</tr>
<tr>
<td>4. To help set priorities for water policy so as to satisfy the right to water. Meeting the basic water requirement for all humans would then take precedence over other management and investment decisions.</td>
</tr>
<tr>
<td>5. To catalyse international agreement on the issue.</td>
</tr>
<tr>
<td>6. To emphasize governments’ obligations to ensure access as well as their obligations to provide international and national support towards efforts to give and protect access to clean water.</td>
</tr>
</tbody>
</table>

Source: Adapted from: Calaguas B., 1999.
realization of other human rights as efficiently as possible (see Box 13). Non-discrimination is a key concept within the right to health. This concept forbids “any discrimination in access to health care and the underlying determinants, as well as to means and entitlements for their procurement, on the grounds of race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth, physical or mental disability, health status (including HIV/AIDS), sexual orientation, civil, political, social or other status, which has the intention or effect of nullifying or impairing the equal enjoyment or exercise of the right to health”.

States are responsible for the progressive realization of human rights, including the right to water, sanitation and food. Therefore, governments must put in place policies and plans that will make health care available and accessible, and will lead to the realization of other human rights as efficiently as possible. Governments’ responsibilities include regulating the actions of non-state actors to ensure the right to health is realized.

Box 13: Clean water, adequate sanitation and safe food and the right to health

When evaluating the right to water, sanitation and food, four criteria may be used:

1. **Availability**: Clean water, adequate sanitation and safe food are available.
2. **Accessibility**: Clean water, adequate sanitation and safe food are accessible to all, encompassing the four dimensions of non-discrimination, physical accessibility, economic accessibility (affordability) and information accessibility.
3. **Acceptability**: Clean water, adequate sanitation and safe food are available in a manner that is respectful, culturally appropriate and gender-sensitive, and honours the confidentiality of all citizens.
4. **Quality**: Water, sanitation and food are of good quality and offered in a way that conforms to appropriate science and medical knowledge.

Source: Adapted from World Health Organization, 2002a.
4. How can health professionals address poverty and gender in programmes for clean water, adequate sanitation and safe food?
4. How can health professionals address poverty and gender in programmes for clean water, adequate sanitation and safe food?

The earlier sections of this module discuss how poverty and gender are linked to clean water, adequate sanitation and safe food, and the importance of addressing these issues, from efficiency, equity and human rights perspectives. This section looks at international, national and community-based strategies that can be applied to improve access to clean water, adequate sanitation and safe food for all, including the poor and other vulnerable or socially excluded groups. The discussion highlights examples of successful interventions to convince health professionals to consider both a diversity of actions and the gender sensitivity and poverty focus of such interventions. Armed with this knowledge, health professionals can become advocates for the adoption and implementation of such programmes as appropriate to their national and local situations.

Policy level

International policies

International treaties and agreements recognize the importance of water, sanitation and food for health and development. International events that have tackled concerns over low coverage of clean water and adequate water, and, more recently, unsafe food, included conferences focused on improving health outcomes, such as the International Conference on Primary Health Care, held in Alma-Ata, Kazakhstan, in 1978, as well as a series of international forums dedicated to water-related issues, starting with the 1977 World Water Conference in Mar del Plata, Argentina. This conference launched the water supply and sanitation decade of 1981-1990 and articulated the goal of improved access to clean water, subsequently adopted as a Millennium

Box 14: The World Health Assembly's commitment to food safety

In 2000, the World Health Assembly discussed the rising importance of foodborne illnesses and the particular challenges faced by developing countries in this respect. It recognized that developing countries rely primarily on traditional agriculture and small- and medium-sized food industry for their food supply, and that in most developing countries, the food safety systems remain weak.

With the adoption of a resolution on food safety, the Assembly urged countries:

1. to integrate food safety as one of their essential public health and public nutrition functions and to provide adequate resources to establish and strengthen their food safety programmes in close collaboration with their applied nutrition and epidemiological surveillance programmes;
2. to integrate food safety matters into health and nutrition education and information programmes for consumers, particularly within primary and secondary school curricula, and to initiate culture-specific health and nutrition education programmes for food handlers, consumers, farmers, producers and agro-food industry personnel; and
3. to develop outreach programmes for the private sector that can improve food safety at the consumer level, with emphasis on hazard prevention and orientation for good manufacturing practices, especially in urban food markets, taking into account the specific needs and characteristics of micro- and small-food industries, and to explore opportunities for cooperation with the food industry and consumer associations in order to raise awareness regarding the use of good and ecologically safe farming and good hygienic and manufacturing practices.

Despite such calls, food safety cannot be addressed unless governments respond with the commitment of sufficient resources and policies and they involve communities in the planning and implementing of interventions. The Assembly requested WHO to support capacity-building in Member States, especially those from the developing world.

The MDG target for clean water was reaffirmed during the Johannesburg World Water Summit for Sustainable Development in 2002. The Summit’s outcome document also outlined a target for improved sanitation coverage to fill this recognized gap in the MDGs. Most recently, the United Nations General Assembly declared the period from 2005 to 2015 as the International Decade for Action: Water for Life. In 2007, Asian leaders adopted the Bangkok Declaration on Environment and Health, which aims to reduce the 6.6 million deaths in Asia annually attributable to environmental risk factors. This Declaration outlined six priority actions for the next three years, including improved access to water supply, hygiene and sanitation. Box 14 outlines the Fifty-third World Health Assembly’s resolution on food safety (WHA53.15).

Statements on the importance of clean water, adequate sanitation and safe food for human development have not always been backed up by committed resources and concerted actions. Recent estimates suggest that US$ 10 billion a year is required to achieve the MDG targets for water and sanitation. This estimate is based on the lowest-cost, sustainable technological options. At present, less than 5% of development assistance is dedicated to the water and sanitation sector. This is a result of a decline in the proportion of development assistance to water and sanitation over the past decade. Based on current levels of commitments, development assistance to water and sanitation will have to be doubled to reach the MDG targets. This translates into roughly US$ 3.6 to US$ 4 billion annually. Given the central role water and sanitation play in improved health and poverty reduction, innovative financing strategies for this sector have received increasing attention.

Merely increasing the level of financing for water- and sanitation-related initiatives, however, may not be enough to guarantee that these benefits reach poor populations. The same is true of food safety interventions, although similar financing requirements to meet MDG 4 may not have been developed. Additional funding needs to be complemented by efforts, when allocating resources, to explicitly prioritize poor and marginalized populations, for example, rural and remote communities or urban poor areas. Targeting investments to poor households is particularly important because these households are often unable to afford user-fees and other forms of payments that many countries and communities rely upon to finance water and sanitation services. Even in situations where households are currently paying for services, such as in urban poor communities, payments for services may amount to a large proportion of their income and may prohibit households from buying other basic necessities, such as nutritious food and health services. With regard to food safety, current

**Box 15: National policy interventions related to food safety**

Examples of prioritization and political commitment related to food safety come from China, the Lao People’s Democratic Republic and Viet Nam, where foodborne trematodes constitute serious health problems. While the problems are mainly found in rural areas and are understood to be associated with poverty, the prevalence of such foodborne infections is increasing in other areas as a result of lifestyle changes linked to incipient economic growth and lack of improvement in education. Greater government attention to foodborne trematode infections has resulted in public awareness campaigns along with either universal or targeted administration of anthelmintics to communities. A further example of policy affecting food safety is provided by China, where the Government is trying to centralize slaughter facilities to improve meat hygiene. Additional examples of policy interventions that governments can consider include targeted infrastructure investments to facilitate better food handling and processing, such as cold storage facilities in ports or clean water supplies in markets.
initiatives to target commercial entities may miss important entry points to improve food safety practices at the household level. In countries where poor households depend heavily on their own food production, these efforts may improve food safety among better-off groups, while leaving the food safety practices of poor households largely unchanged.

**National policies**

While international policies can effectively renew commitment to and guide actions for clean water, adequate sanitation and safe food, they will not be successful unless national governments back them up with sound national policies, based on local and international evidence and best practices, and sufficient financial and human resources. As such, efforts are required to galvanize broad-based political support for the water, sanitation and food targets expressed in international declarations and commitments. Box 15 discusses examples of political commitment for food safety in the Region.

Political support is vital to ensure that appropriate policies and plans for stronger action on water, sanitation and food are formulated and implemented. Although such policies are inherently cross-sectoral in nature (see the section below), ministries of health can lead efforts to mobilize needed political support and buy-in from a range of stakeholders, including politicians, civil society organizations, academics, the private sector and diverse government ministries. Support for water, sanitation and food from poor and marginalized communities and groups, such as urban poor organizations and women's groups, can also be leveraged to sustain upward pressure on political leaders over time. Mobilizing broad-based political support for sanitation is especially important since it remains stigmatized in many countries. Politicians can be reluctant to advocate for issues related to sanitation, especially human defecation.

National food safety systems include the regulatory and normative frameworks that govern all steps in the food chain to ensure the safety of food. Box 16: Food safety and international trade

Food safety is no longer only a public health matter. For more and more countries in the Region, it has become a key trade issue. Establishing a legal and regulatory framework for food safety is often a necessary first step for a developing country to achieve access to export markets. However, these frameworks are increasingly influenced by the standards, guidelines and recommendations outlined by the Codex Alimentarius Commission and its subsidiary bodies and in the sanitary and phytosanitary agreement of the World Trade Organization.

There is concern that these international agreements may create or widen existing disparities between countries. Developing countries often lack the necessary technical and financial resources to implement international agreements, which can lead to their exclusion from the international food trade. This concern is exacerbated by the unequal and relatively weaker bargaining power of developing countries in the international forums where such agreements are negotiated.

Within countries, large commercial entities are more likely to have the capacity to conform to regulations than small producers, which may find the costs prohibitive. This suggests that international agreements are designed to protect the international food supply, not to secure the domestic food chain or to reduce poverty. At best, such outcomes may be by-products of efforts to conform to international standards. As a result, food safety managers in developing countries are increasingly encouraged to identify a level of protection that can guarantee the desired food safety. This approach recognizes that developing countries may need to explore various low-cost methods to ensure food safety for their citizens.

of the food supply, the government institutions responsible for formulating and implementing laws and regulations related to food safety, and food producers and industry, universities, researchers, the media and consumers. Well-functioning national food safety systems enable strong partnership between these diverse actors to ensure effective coordination, cohesive strategies and good communication. At the same time, national food safety systems need to be designed in such a way as to identify and involve a broad range of stakeholders, particularly those from low-income communities or from marginalized groups, such as ethnic minorities. Space also needs to be created for women’s groups to voice their views on food safety issues and to be involved in decision-making and monitoring activities, given the primary role women typically play in the household-level management of food and water.

At the same time, national food safety systems increasingly operate in an international environment and are influenced by trade agreements and multilateral arrangements. This environment often demands the adoption of policies and regulations that most effectively minimize food-related risk. However, the costs associated with these policies and regulations need to be carefully considered in a developing country context. The approaches adopted by national food safety systems in developed countries may be too costly or may not produce the desired effect in low-income settings. As a result, existing policies, regulations and approaches need to be carefully tailored to suit developing country contexts and to meet the needs of low-income or marginalized communities (see Box 16). To be effective, political commitment needs to be translated into clear policy goals with dedicated financial and human resources. A clearly articulated national policy or policies on clean water, adequate sanitation and safe food can create a framework to guide actions at all levels of the health sector. These policies should ensure transparency, accountability and reinforce principles of good governance.

For example, an effective response to current challenges of food safety among countries in the Region should be rooted in core aspects of good governance. These are:

- openness (institutions should work in an open manner)
- participation (ensuring wide participation of relevant interested and affected parties throughout the policy chain)
- accountability (institutions must inform and explain what they do, review their practices and take responsibility for what they have done);

<table>
<thead>
<tr>
<th>Box 17: United Nations-advocated targets for equity in water and sanitation</th>
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Recently, the United Nations has called for national policies on water and sanitation to integrate equity-related targets and to enshrine the right to water in national legislation, backed by an enabling policy environment. This would ensure a firm entitlement to a “secure, accessible and affordable supply of water.” What this entitlement will mean in practice will change depending upon the local context. Nevertheless, the United Nations argues that it aims for a minimum target of 20 litres of clean water a day per person. In addition, recognizing the different abilities of people to purchase water, this entitlement should include a provision that provides free water for those too poor to pay.

In practice, the United Nations is advocating for the inclusion of an additional target to the water- and sanitation-related MDG. This target is to “halve the gap in coverage ratios between rich and poor” within the same timeframe as the other targets. At national and local levels, this target would be complemented by targets and indicators that monitor progress by public and private water utilities to address equity concerns. To be effective, such targets should be complemented by adequate resources as well as penalties for non-compliance.

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- effectiveness (policies must deliver what is needed on the basis of clear objectives, and in a timely manner); and
- coherence (policies and actions should be consistent and easily understood).

These principles should be used to guide food safety policies and should be extended to all aspects of implementation, including coordination, law enforcement and surveillance. These principles will ensure that the rights of all citizens, including those who are most marginalized, are respected. They can also build trust in food safety policies and systems of implementation.

Of particular concern is how the goals of national water, sanitation and food safety policies are formulated. Evidence suggests that goals to maximize health gains across the population as a whole can be achieved without improving the health of marginalized or hard-to-reach populations. This general conclusion holds for national water, sanitation and food safety goals, too, where trends in the average coverage of improved water and sanitation sources can mask striking inequalities in access to these basic services between rural and urban communities, between poor and non-poor households, and between men and women (see Box 17).

Therefore, actions in water and sanitation need to be articulated in terms of responding to the needs of both women and men as well as improving the coverage for those who are poor and marginalized. With regard to food safety, this may include a focus on the exposure and consumption patterns among marginalized communities that increase their vulnerabilities to foodborne pathogens, or the conditions in which poor households access, prepare, handle and consume food. Generally, policies (and the resulting plans and programmes) should focus attention on the needs of women, persons with disabilities, older people and persons who are socially vulnerable or marginalized.

Expressing policy goals explicitly in these terms can promote the integration of poverty and gender concerns into water, sanitation and food policies. In addition, experience suggests that policies that concretely focus on poor and excluded populations are able to identify and address their needs. In urban areas, such policies could include addressing land tenure rights of informal settlements, including an end to forced evictions. This approach also sees poor households and communities as active participants in the design and implementation of these policies.

Cross-sectoral action

Responsibility for water and sanitation is often split between ministries that are mandated to deal with wider sets of issues. In many cases, authority for domestic water and sanitation is lodged within an array of responsibilities allocated to junior ministers. Responsibility for food safety may be similarly spread over a number of ministries. As such, strong links are needed between water-, sanitation- and food-related policies, programmes and plans and actions across other sectors.

At the global level, WHO set up a Commission on the Social Determinants of Health to provide advice on how to reduce the impact of social determinants on health inequalities. The Commission’s final report drew attention to these inequalities and recommended strategies to improve the health of the poor by addressing the social determinants of health. The recommendations included a strong focus on improved access to clean water, adequate sanitation and safe food.

At the national level, multisectoral planning instruments such as Poverty Reduction Strategy Papers (PRSPs) can provide the basis for a cross-sectoral approach to tackling the social determinants of health and offer an opportunity to increase policy coherence and undertake joint planning to address water, sanitation and food safety. PRSPs can also promote more effective resource mobilization and allocation. However, evidence suggests that, to date, although water and sanitation are recognized as determinants of poverty, the PRSP process has not systematically incorporated attention to clean water and
adequate sanitation. The Overseas Development Institute and WaterAid analysed 17 PRSPs for sub-Saharan Africa and concluded that “water supply and sanitation has been inadequately reflected both in terms of process of PRSP preparation and the content of emerging PRSPs.” More recently, nine PRSPs from Asian countries were assessed for their attention to clean water and adequate sanitation. The analysis found that PRSPs for Asian countries rarely articulated needs or priority actions related to clean water and sanitation. In addition, evidence to date suggests that there is a general low level of coordination and cooperation among ministries responsible for food safety and other ministries, such as those responsible for poverty reduction and women’s empowerment.

Ministries of health, therefore, need to secure a central role in multisectoral development planning processes and to advocate for the inclusion of water, sanitation and food safety within national socioeconomic development plans or PRSPs. Such advocacy can be premised on the economic benefits of investing in water, sanitation and food safety and national obligations stemming from international commitments to promote and protect the access of vulnerable or excluded population groups to clean water, adequate sanitation and safe food.

Given the demonstrated relationship between access to clean water, adequate sanitation and safe food and reductions in the burden of ill health, considerable gains could be achieved through coordinated cross-sectoral action to mobilize political commitment and financing for clean water, adequate sanitation and safe food (see Box 18). At present, the low level of coordination on issues related to food safety tends to result in a situation were food safety legislation overlaps in some areas and leaves gaps in others. This can lead to uneven enforcement, leaving marginalized groups particularly vulnerable. Ministries of health

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**Box 18: Cross-sectoral action for healthy marketplaces**

A healthy marketplace is a setting in which everyone works together to achieve an agreed vision for the health and safety of the market community. A healthy marketplace is one that is continually creating and improving the market’s physical and social environments and creating a situation where the market community itself is empowered to achieve its maximum potential. Areas of priority concern, related activities and methods of implementation may differ considerably across different markets. Priority issues may be air quality, water supply, sanitation, hygiene, chemical safety, fire safety and food safety, among a variety of other issues.

A key component of any healthy marketplace initiative is cross-sectoral collaboration among stakeholders from government, nongovernmental organizations, and the private sector, including trade unions. Within markets, access to utilities and services, including protection from harassment, varies among vendors. Often the most vulnerable traders are street vendors or hawkers, who tend to be women.

In Ahmedabad, India, the Self-Employed Women’s Association (SEWA), a trade union for women working in the informal sector, advocated for the recognition of the rights of street vendors, particularly the right to work. When the Ahmedabad Municipal Corporation (AMC) began to evict street vendors and hawkers from a central market to create additional parking space and ease traffic congestion, SEWA challenged these actions. Using the legal framework of the country, SEWA took the matter to the Supreme Court. The Supreme Court ruled for SEWA, AMC and the police to find a mutually agreeable solution. In response, AMC provided the street hawkers and vendors with another space in close proximity to the market centre. The AMC also provided access to facilities and utilities. A secure licence with a photograph also acknowledged the right of street hawkers and vendors to legal protection. For SEWA, these steps enabled their members to realize their right to employment and ply their trade in safety.

need to advocate for the inclusion of these issues in national food safety systems.

Such cross-sectoral coordination should be guided by a commitment to addressing poverty and gender-related concerns in relation to water, sanitation and food safety. To this end, cross-sectoral coordination led by ministries of health should incorporate and nurture partnerships with partners such as the women’s or gender machinery of government and civil society organizations with explicit commitments to gender equality. National food safety systems need to involve a similarly diverse range of actors from government to nongovernmental organizations (NGOs) and the private sector (see Box 19).

Partnerships with urban poor communities, rural organizations and groups representing poor and marginalized communities can ensure broad-based commitment to poverty concerns in relation to water, sanitation and food safety. The involvement of these groups in national food safety systems is critical. This is because agricultural livelihoods are critical for many of these groups, for example, and can lead to increased exposure to food-related hazards. With regards to water and sanitation, reaching these groups is often central to realizing water- and sanitation-related targets. The involvement of these groups can better ensure the efficiency and effectiveness of such interventions. Such broad coalitions can mobilize support across diverse stakeholders and segments in society towards reducing gender-based and poverty-related inequalities that determine access to and use of clean water, adequate sanitation and safe food.

Similarly, creating an enabling environment for improved access to clean water, adequate sanitation and safe food extends beyond the health sector to include a range of national laws, regulations and policies. One aspect of such an enabling environment could include the establishment of a social minimum in the prevailing legal system. For example, the United Nations advocates for a social

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**Box 19: Policies and partnership to secure access to clean water in the Pacific**

Protecting safe water supplies is of increasing concern among Pacific island countries and areas. Indeed, climate change is expected to put additional stress on already scarce water resources. Recognizing the value of an intersectoral approach, WHO and the Pacific Islands Applied Geoscience Commission (SOPAC), a Pacific-owned technical organization, established a partnership with support from the Australian Agency for International Development (AusAID) to maintain safe water supplies and raise health standards.

This partnership has a strong policy foundation. The Pacific Regional Action Plan on Sustainable Water Management was prepared by SOPAC in 2002. In 2005, WHO helped draft the Pacific Framework for Action on Drinking Water Quality and Health, which was endorsed by ministers of health as part of the Samoa Commitment.

Together with national ministries and local communities, WHO health experts and SOPAC water specialists support the development of “Water Safety Plans.” These plans are designed to improve the quality of water among Pacific island countries and areas and make it safe to drink. Pilot projects in Cook Islands, Palau, Tonga and Vanuatu have demonstrated the success of this approach.

Strong partnerships have been critical to the success of this initiative. The intersectoral partnership between WHO and SOPAC is mirrored at the country level, where steering committees formed of ministries of health, water and the environment sit together with civil society organizations and representatives from the private sector. At the local level, communities are working together to protect and maintain their own water systems.

minimum of 20 litres of clean water per person per day.\textsuperscript{167} When articulated in policies and backed by legal mechanisms, social minimums can become a powerful tool for citizens to demand improved access to clean water.

An enabling environment for water, sanitation and food safety could also include a review of cross-sectoral policies to ensure complementarity and coherence. For example, educational policies could be reviewed to ensure they provide for improved water and sanitation facilities in schools. This could complement efforts to enhance girls’ education. Such efforts should extend from the national to local levels. In many communities, local authorities have avoided recognizing street food vendors, preferring instead to ban them. As a consequence, police focus on trying to enforce such bans, while the general public commonly ignores the regulations and uses vendors to enhance their access to affordable food. In such communities, local authorities make few efforts to provide hygiene or sanitation services and/or license or train vendors. Policy-based interventions can assist authorities, consumers and vendors to work together to enhance the safety of street-vended foods (see Box 23).

\textit{The role of legislation}

Effective implementation and regulation are core elements of laws and policies to ensure efficient and equitable access to clean water, adequate sanitation and safe food. To achieve this end, regulatory bodies should be independent and vested with the authority to investigate allegations of poor performing water providers – from both an efficiency and equity perspective – be they private or public. Regulation of water providers needs to extend to vendors and standpipe operators. Requiring transparency from water providers is critical. Regulatory authorities should ensure that water providers widely publish information on pricing and cost structures and water quality. Involving diverse civil society organizations in the processes of monitoring regulatory developments and enforcement can improve the transparency and accountability of such processes to citizens and thereby contribute towards building broad-based support for appropriate actions on water, sanitation and food safety. Such multi-stakeholder processes can also generate consensus and support for further action and implementation.

\textbf{Financing for clean water, adequate sanitation and food safety}

The manner in which revenue is raised and funds are allocated can influence access to clean water, adequate sanitation and safe food differently for men and women, and for the poor and non-poor. Countries in the Region use various methods to mobilize and allocate resources for water and sanitation and for the health sector more generally. The sector-wide approach (SWAp), for example, is an increasingly popular method of developing the strategy for allocating resources. Such methods for allocating resources tend to rely upon priority-setting mechanisms that use measures such as disability-adjusted life years (DALYs). When plans for resource allocation are formulated, it is vital that water, sanitation and food safety be prioritized.

Most countries in the Region finance the provision of water and sanitation through a combination of revenue-raising mechanisms: tax revenues, donor funding and/or out-of-pocket payments or user fees. In many areas, public spending on water and sanitation has generally been low, less than 0.5% of GDP on average.\textsuperscript{168} Among countries in Asia, only 15%–20% of investments allocated to the water and sanitation sector are dedicated to sanitation.\textsuperscript{169} This low level of public financing has generally resulted in inefficient and poorly maintained public utilities. The pricing system used by many public utilities is part of the problem, as it traditionally covers only a small fraction of operating costs. For example, a study of 49 Asian water utilities concluded that the operating incomes of 35 providers did not cover their operating and maintenance costs.\textsuperscript{170} Underinvestment in improved water and sanitation sources in rural areas is often compounded by the fact that it can be more expensive and more difficult to deliver services to dispersed rural populations than urban populations.\textsuperscript{171}
How can health professionals address poverty and gender in programmes for clean water, adequate sanitation and safe food?

In response to inefficiencies in public provision, attention has turned in recent years to the potential role of the private sector to effectively and efficiently deliver water and sanitation services. Available evidence suggests that the benefits of private sector involvement are not automatic, but depend on a complex set of factors, including relationships with government, i.e. private or public-private partnerships, the process of privatization and the pricing and regulatory system (see Box 20).

With specific regard to equity concerns, evidence suggests that full cost recovery is more than many households can afford. Experience points to some strategies to improve access of poor households to water from private suppliers. These include lifeline or step tariffs, which provide free services up to a given level and then charge normal fees thereafter, as well as cross-subsidies from better-off to poor households through utility pricing or targeted fiscal transfers, such as those to urban poor communities. For example, in Durban, South Africa, the first 25 litres of water a household uses per day from the water utility are provided free of charge. This is deemed to be a social tariff that ensures that low-income households have access to the social minimum required for a healthy life. After this level, the block tariff rises rapidly to promote the goals of water conservation as well as revenue generation to adequately cover the costs of water delivery. This model of a rising block tariff ensures affordability, while also pursuing efficiency, provided that the higher tariffs are set at a level that can cover operation and maintenance costs. It can also ensure equity – through cross-subsidization from high- to low-income households – provided that poor households are connected to the water utility.

In communities where poor households are rarely connected to the water utility, a rising block tariff model with a social minimum will allow middle- and high-income households to skim off the benefits from subsidies actually intended for the poorest. In these cases, alternative financing models are required. Further, as discussed in the sections above, private providers who sell water to poor...
households beyond the reach of the utility often purchase water in bulk. In a system of rising block tariffs, this often means that the private provider will pay among the highest tariffs for the water. This high price is transferred to poor households through the network of vendors and standpipe operators.

**Service delivery**

The principles of community participation, appropriate technology and gender equality should underpin all interventions that aim to improve the access of poor men, women, boys and girls to clean water, adequate sanitation and safe food. These approaches have been proven successful in improving the coverage of clean water and adequate sanitation, in particular. When combined with a responsive policy and regulatory framework, these methods can be effective, equitable and sustainable in the long run, effectively improving the geographical coverage of improved water and sanitation and promoting practices that increase the safety of food. Such approaches can also reduce the costs associated with the provision of clean water, adequate sanitation and safe food, particularly when combined with a national commitment to financing systems based on equity and efficiency goals. Box 21 highlights these issues with regard to food safety.

**Community-based approaches**

Experience from around the globe demonstrates that to successfully reach poor communities, interventions in water and sanitation need to involve poor people, particularly women (see Box 22). A good way to do this, in line with the human rights approach, is to adopt participatory methods that empower communities (including women in the community) to decide on their own priorities, and to plan, implement and evaluate interventions. Participatory methods can be very effective in giving both men and women a voice, and in revealing gender, class and cultural differences, so that solutions are more equitable and sustainable.

Care needs to be taken, however, to ensure that the voices of all community members are heard. This requires strategies to ensure the inclusion and equal participation of men and women and those from low-income or ethnic minority households. Where women are especially disempowered, holding segregated meetings may enable women to speak freely. Similarly, it may be better to seek the input of marginalized groups in forums where powerful members of the community are not present. In addition, meetings should be organized at times conducive for both men and women, as men and women often have different roles and responsibilities.

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**Box 21: Improving the delivery of interventions to enhance food safety in the Region**

Current efforts to establish and strengthen national food safety systems tend to focus on the formulation of national policies and regulations, targeting the role of commercial entities in food safety. To date, little attention has been given to household- and community-level actors, including taking into account the different roles of men and women. As a result, there is little evidence about such practices in the Region.

Despite the relative lack of empirical evidence on household-level food safety practices and their impact, however, it is reasonable to assume that significant progress in reducing the level of foodborne illness in the Region will require a concerted effort to target households and communities. This is because many of the key issues related to food safety have to do with the ability of households, and particularly women within these households, to adopt safe food handling, marketing and consumption practices. To this end, national food safety interventions need to consider how to effectively engage with these stakeholders to adequately respond to their needs and concerns. It is likely that the principles discussed below remain central to ensure the success of such initiatives, even though much of the evidence is drawn from the water and sanitation sector.

In particular, since women are the main carriers and managers of water for household use, as well as being responsible for food preparation, child care and family hygiene, they must be included in decision-making for the design and management of water, sanitation and food safety projects, to ensure their appropriateness and sustainability. The importance of ensuring the equal participation of women cannot be overstated. In the past, women have been overlooked in the planning and implementation of projects. A World Bank review of 121 rural water supply projects found that women’s participation is one of the variables strongly associated with project effectiveness.174

Evidence from numerous countries points to the effectiveness of women’s participation in planning, implementing and maintaining water and sanitation projects. When combined with the extension of appropriate technologies, this approach has often achieved impressive success. For example, in Bangladesh, an initiative to reduce the prevalence of cholera among rural villages taught women how to use old cloth from saris to filter their drinking water. Sari material was found to be not only as effective as nylon filters in filtering zooplankton from water, but also cheaper and more readily available in poor communities. Moreover, this creative use of existing resources and simple techniques, combined with its focus involving women, proved to be successful: the incidence of cholera decreased by 48%.175

More recent experience shows the pitfalls of engaging only men or women, suggesting that interventions must carefully consider the gender roles and responsibilities prevalent among communities and how these affect the provision of clean water, adequate sanitation and safe food. The benefits of working with both women and men in a gender-sensitive approach are seen in the Lesotho Rural Sanitation Programme (see Box 23).

Box 22: Urban poor associations as key actors in improving access to clean water, adequate sanitation and safe food in squatter settlements

Worldwide, one in six people live in urban slums. According to the MDG Taskforce on Improving the Lives of Slum Dwellers, a slum household is defined as a group of individuals living under the same roof, who lack one or more of the following necessities: access to improved water, access to improved sanitation facilities, sufficient living area, structural quality and durability of dwellings, and security of tenure.

Experience shows the importance of partnering with urban poor associations. Community-driven processes that are initiated and managed by slum dwellers have proved effective in improving the living conditions in slums. The aim is not to replace government, but to build partnerships to meet the needs of urban poor communities. The leaders of these organizations are almost always women, who build extensive social networks with and knowledge of other members.

In Cambodia, the Urban Poor Federation represents roughly one half of the informal settlers in Phnom Penh and 10 other urban centres. Through community-based savings and credit schemes, the Federation has assisted poor communities in pooling their resources and identifying strategies to address problems of land, security, houses, toilets, basic services and access to credit. Similarly, the Homeless People’s Federation in the Philippines works with communities in many cities, particularly settlements in high-risk areas (e.g. dumpsites, river banks, along railway tracks, land subject to flooding, land under bridges, areas at risk of eviction). The Federation mobilizes communities to identify needs and build the capacity of inhabitants to prepare plans to address the issues.

These and other similar federations worldwide generally have high standards of internal transparency, democracy and accountability, and tend to be less costly than other types of governance initiatives.

Source: UN Millennium Project, 2005b.
Integrating Poverty and Gender into Health Programmes: A Sourcebook for Health Professionals

Module on Water, Sanitation and Food

**Box 23: Lesotho—rural women take on latrine construction**

Women have proved to be a very viable resource in designing, implementing, operating and maintaining water and sanitation systems in their communities. The Lesotho Rural Sanitation Programme, initiated in 1983 by the United Nations Development Programme (UNDP), World Bank and various other donors, is an excellent example of women’s technical capabilities.

The project was designed to train women and men how to build latrines: one in four builders was a woman. Preferring to work in pairs, women would often teach other women how to build latrines. They were also more likely than men to reduce their fees to accommodate those who could not normally afford the latrines, offering the community an affordable and sustainable water and sanitation system. These women were each other’s counsellors and even financial advisers. Some groups created revolving credit systems to build household latrines, and others sought information on setting up and managing credit systems for the construction of latrines and water systems.


**The role of technology in improving water and sanitation services**

It is generally accepted that the technology is available to provide full coverage of secure access to clean water and adequate sanitation in most settings. Generally, however, the constraint is not the range of available technologies but rather the lack of strong political and financial commitment from international, national and local decision-makers. In some circumstances, technological norms and policies can constrain the updating of various technologies.176

In many cases, available technologies for water and sanitation services need to be adapted to local circumstances. This is especially important from a gender- and poverty-oriented perspective. It is critically important that available technologies respond to the preferences, beliefs and practices of the intended users, both men and women. Furthermore, technologies need to respond to available financing, whether public or private, and should be sustainable in the given setting, i.e., they should be reliable, secure, and available in the long-term.177 Finally, the capacity of the service provider or community to maintain the

**Figure 21: “Sanitation ladder” for urban and rural services**

<table>
<thead>
<tr>
<th>Service Type</th>
<th>Estimated Cost per Person (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tertiary waste water treatment</td>
<td>800</td>
</tr>
<tr>
<td>Sewer connection and secondary wastewater treatment</td>
<td>450</td>
</tr>
<tr>
<td>Connection to conventional sewer</td>
<td>300</td>
</tr>
<tr>
<td>Sewer connection with local labor</td>
<td>175</td>
</tr>
<tr>
<td>Septic tank latrine</td>
<td>160</td>
</tr>
<tr>
<td>Pour-flush latrine</td>
<td>70</td>
</tr>
<tr>
<td>Ventilated improved pit latrine</td>
<td>65</td>
</tr>
<tr>
<td>Simple pit latrine</td>
<td>45</td>
</tr>
<tr>
<td>Improved traditional practice</td>
<td>10</td>
</tr>
</tbody>
</table>

How can health professionals address poverty and gender in programmes for clean water, adequate sanitation and safe food?

Technology should be taken into account. Taking these considerations into account, decision-makers and planners can gradually move from household-focused solutions that meet immediate needs to more complex and more expensive collective solutions. For example, Figure 21 describes steps to making progress in sanitation services.

A number of efforts have focused on empowering men and women in poor communities while at the same time introducing appropriate technology. Such interventions have a history of supplying necessary infrastructure, maintaining the infrastructure for much longer periods than more technology-centred interventions, bringing about successful behaviour changes and enhancing the health of communities. For example, the experience of the Orangi Pilot Project, in Karachi, Pakistan, which tapped the skills and resources of urban poor communities to replace open sewers with underground sewers, suggests that the introduction of technology interventions should at the same time be accompanied by the provision of health education, since both sets of activities complement each other. Recent experience from a number of countries suggests that an effective way to create change with regard to sanitation is to empower communities to find their own solutions and to identify the most appropriate technology (see Box 24).

Importantly, expanding appropriate technologies can reduce the costs associated with clean water, adequate sanitation and safe food. To reduce the costs of fuel, technology may be applied to replace inefficient cooking fuels and processes with alternative appropriate technologies. Where improved technology results in greater fuel efficiency, unused fuel is being used for boiling water. This will have obvious effects on the safety of drinking water and the burden of waterborne diseases.

Improving knowledge and information

Advocacy or health communication strategies are often used in water, sanitation and food programmes to communicate information strategically with the aim of changing the perceptions and influencing the decision-making of individuals. Indeed, interventions that encourage the adoption of risk-reducing practices and actions remain a core aspect of promoting improved hygiene. Education and raising awareness are essential to improve the health of populations, communities and individuals. Providing information on preventive practices, such as hand-washing and proper disposal of waste, can enable people to make decisions that positively influence their exposure to waterborne and foodborne hazards and disease.

For example, where the environment is polluted, using appropriate technologies can reduce the costs associated with clean water, adequate sanitation and safe food. To reduce the costs of fuel, technology may be applied to replace inefficient cooking fuels and processes with alternative appropriate technologies. Where improved technology results in greater fuel efficiency, unused fuel is being used for boiling water. This will have obvious effects on the safety of drinking water and the burden of waterborne diseases.

**Box 24: Community-led total sanitation**

Community-led total sanitation has been proven successful in many countries for galvanizing collective action to improve sanitation within communities. The process begins with a community-driven assessment of current sanitation practices. In many places, open defecation is the most common sanitation practice. Residents map out the locations of their houses and areas of defecation. With the help of a facilitator, who must remain hands-off and allow the community to lead the process, residents tour the community and visit the places where defecation occurs. Together, they estimate how much faeces is produced in total and per person each day. They proceed to analyse the routes of contamination, such as through the water sources, and estimate how much faeces each person ingests each day.

This process usually leads to feelings of shame, disgust and self-respect that galvanize communities to declare an end to open defecation. Possible alternative sanitation technologies are considered by the community in line with their preferences and ability to pay. A central principle of this approach is that no promise of a subsidy of sanitation facilities can be made; such promises dilute the willingness of community members to take action. As a result, there has been an explosion in innovative, low-cost solutions.

Source: UN Millennium Project, 2005a.
where the food is likely to be contaminated, and where overall food control is weak because of lack of resources, education of consumers and food handlers can guide them in taking specific and often simple measures to render food and drinking water safe.

Effective health communication strategies are tailored to the specific characteristics and needs of the intended population group. For example, food safety is an important addition to school health programmes (see Box 25). The ministry of health should play a leading role in formulating and providing appropriate educational materials. It should also establish and maintain relationships with other government departments that are required to implement effective education programmes for improved hygiene behaviours. Evidence to date suggests that a mix of communication strategies – mass media campaigns, integration of hygiene messages into educational curricula, and deployment of community-based programmes – is most effective.180

Box 25: Food safety messages for at-risk schoolchildren

1. Avoid bringing food made from meat, eggs or rice from home unless it can be stored under cool conditions and is eaten within four hours of having been prepared.
2. If buying cooked food, choose only food that has been thoroughly cooked and is still hot when purchased.
3. Avoid buying or eating high-risk food, particularly ice cream, drinks containing ice and juices, when unsure of the hygiene used by the vendor or preparer.
4. Avoid drinking raw milk or other raw high-risk foods during school activities.
5. Avoid buying highly coloured food that may have been prepared with unsafe food additives.
6. Wash hands thoroughly before handling food and eating.


Women may be harder to reach than men through conventional health promotion efforts. In many countries, women often have lower levels of literacy than men and gender norms may restrict their access to mainstream media. Since women tend to gather health-related information from relatives and social networks, interpersonal modes of communication may be more effective in communicating health-related information to women than print media, for example. Involving the poor and women in the design and implementation of health communication campaigns can ensure that local knowledge, priorities and needs are understood and subsequently addressed (see Box 26). These strategies may likewise ensure that the message and medium of health promotion campaigns are accessible for women.

Behaviour change is a complex process. Merely making information available may not be enough to change behaviour. For example, messages about food safety may not translate into improved food preparation, especially if a household does not have the income to purchase the required fuel or the water to ensure appropriate hygiene. Experience shows that the existence of a latrine does not necessarily mean it will be used. Moreover, dealing with people's behaviour in relation to sanitation and excreta is particularly sensitive. People may
not understand the hazards of defecating outside, which is often considered to be normal behaviour. Some communities believe that children’s excreta are harmless. Addressing these beliefs is crucial when seeking to promote new behaviours that incorporate use of sanitary facilities and handwashing.

To improve knowledge and behaviour among communities, a thorough understanding of local norms and behaviours is essential. For example, an evaluation of a large-scale hygiene promotion programme in Bobo-Dioulasso, Burkina Faso, found that the success of the intervention lay in its recognition that women did not associate diseases with children’s faeces. In response to this realization, novel strategies were used to target the specific risk practices of not washing hands with soap after stool contact and inadequate disposal of children’s stools. Community organizations and NGOs are often best placed to engage with communities on these issues. They often live in the targeted communities and have a sound understanding of the them, know what language to use to effectively change behaviour, and know how to best approach sensitive and taboo topics.

Health communication strategies typically focus on creating change at the level of individuals or households. However, they may fail to recognize the influence that broad sociocultural elements can have on individuals. For example, improved hygiene practices are often difficult to carry out in areas with little or no water. To be effective, therefore, communication strategies need to not only target the individual, but also aim to create an environment that is supportive of the advocated social or behavioural change.

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**Box 26: Improving complementary food hygiene practices in an urban slum in Brazil**

To better understand harmful food hygiene practices and how to change them, a study was carried out in a Brazilian urban slum with an infant mortality rate of one in 10 live births. The intervention study aimed to promote optimal complementary food hygiene practices by emphasizing feasibility, cultural acceptance and careful wording of messages, so as to maximize the likelihood of behaviour change. By interviewing mothers of infants and observing what they did at home, the project identified key behaviours likely to increase the risk of contamination of complementary foods:

1. Ninety-five per cent of women did not wash their hands before preparing and giving infants food even though all households had soap and water.
2. Nearly all women used plastic feeding bottles that were neither washed with soap nor boiled before use.
3. Water stored overnight in unhygienic conditions was commonly used to prepare milk formulas or gruels without boiling it.
4. Storing prepared milk and gruel at room temperature for later use was common.

Based on this analysis, four changes in behaviour were chosen for a one-month household trial: washing hands before preparing food, boiling water, using a cup and spoon rather than a bottle, and preparing only fresh food. Suggested changes were based on practices already existing within the community. The successful one-month trial showed that all the behaviour changes were feasible. Several key lessons were identified:

1. Women’s knowledge and experience are crucial to achieving behavioural change.
2. Health workers need to find local beliefs that can be applied to encourage women to identify the potential.
3. When a suggested improvement clashes with a mother’s beliefs, it is better to abandon it and to identify a more acceptable alternative that will achieve the same effect. For example, women strongly believed that storing water overnight was necessary to release ‘the sun’s heat’. The project did not try to change this, but instead encouraged mothers to boil water for mixing powdered milk to be added to gruel.

Where structural factors may impede the ability of individuals to change their behaviour, such as a lack of income or titles to land, a ‘rights plus’ approach can create a means for change. This approach works with people not only to support their rights to water, sanitation and food, but also to ensure that they influence and shape the process by which they obtain these rights. This relies on enhancing people’s knowledge and building solidarity among households and communities to claim their rights. The combination of knowledge and social action enables communities to develop solutions that can meet their needs, which they then negotiate with local authorities. The focus is on developing realistic solutions that can be effectively implemented and can deliver the required service or good.182

Box 27: Analysis of food safety issues from a poverty or equity perspective

The current limitations of food safety data and data requirements at national and international levels to enable effective prevention, control, detection and response are well understood. Efforts are under way to expand the scope of current data collection initiatives through international collaboration and studies and, importantly, to strengthen national surveillance and monitoring systems. Surveillance and monitoring systems are a key aspect of national food safety systems because the regular production of timely, good quality data is the foundation for a system that provides effective protection, control, detection and response to emerging problems.

An analysis of national surveillance and monitoring data can provide a comprehensive overview of food safety issues in a country over time. However, data collected at the national level can mask important variations in the burden of foodborne hazards and illnesses among certain populations. Analyses of data on food safety issues at the national level or with regard to a single population do not provide insights into how foodborne hazards and illness may affect different groups of people differently. In contrast, a more nuanced assessment of information on foodborne hazards and their sources as well as on the incidence of foodborne illnesses by various pathogens, analysed by indicators of poverty and social exclusion, can shed light on equity-related patterns in food safety issues in a country.

Because of this, efforts to enhance the food safety information systems should ensure that the collection and analysis of such information can be disaggregated by socioeconomic status, sex, urban-rural location, region or province, ethnicity, level of educational, occupation, or other relevant indicators of disadvantage. Monitoring and evaluation of food safety systems in the Region should also include such social stratifiers. These efforts can be supplemented by appropriate equity-focused research, including the use of qualitative methods to assess various financial and non-financial constraints that may prevent men and women in poorer households and communities from enjoying safe food. Studies can also be focused to provide information on important gaps in current equity-related knowledge of food safety issues in the Region.

Such disaggregated information and equity-focused analyses can be used to identify priority areas for action and to assess the differential impact of national and subnational initiatives. For example, as the section above shows with regard to access to clean water and adequate sanitation in the Region, deficiencies in access tend to be concentrated in specific groups within a country. Targeting interventions towards these groups can produce a more effective response, given scarce resources. Efforts to disaggregate data related to food safety along indicators of poverty and social exclusion can inform similarly nuanced responses.


Water, sanitation and food policies need to be grounded in an analysis of timely and accurate data and research on the needs of men and women and people who are poor as compared with those who are better-off. Food safety policies need to be informed by data generated through the national
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How can health professionals address poverty and gender in programmes for clean water, adequate sanitation and safe food?

How can health professionals address poverty and gender in programmes for clean water, adequate sanitation and safe food?

However, despite the growing recognition of persistent and often increasing inequities in access to clean water, adequate sanitation and safe food, both in developing and developed countries, health information systems have been weak in yielding information needed to assess and address health inequities. Food safety surveillance systems rarely generate sufficient data to enable the analysis of inequalities in the burden of food hazards or foodborne diseases (see Box 27). As such, countries are faced with the challenges of determining the information needs for addressing health inequities, shaping health information systems to meet those needs, promoting sensitization to equity issues, and developing the skills required to use information for effective planning and policy-making. The Health Metrics Network, a global partnership of developing countries, agencies, foundations and technical experts that facilitates better health information at country, regional and global levels, has begun work on the construction of equity indicators and on creating mechanisms to link records between data sources.

At the national and subnational levels, data that are disaggregated by various relevant social stratifiers (such as age, sex, income, ethnicity, urban-rural location, etc.) are required to assess and analyse the extent of inequalities in water, sanitation and food, as well as to monitor changes in these patterns over time. Likewise, disaggregated data are needed to identify priority areas and interventions that will benefit poor individuals and how interventions

**Box 28: A community-based surveillance system in West Bengal, India**

In West Bengal, India, a community-based surveillance system has been established that consists of a network of 20 block-level laboratories, equipped with spectrophotometers and managed by locally recruited chemists, as well as two state referral laboratories using hydride generation - atomic absorption spectrophotometers (HG-AAS). Under the oversight of the Public Health Engineering Department, the 20 community laboratories are run by NGOs that were already established in the area, operating rural sanitary marts to market sanitation to the local population.

The decision to use more costly spectrophotometers rather than cheaper but less accurate field test kits was based on several factors. First, when the decision was made, field-testing had not provided results reliable enough to declare a water source as safe or unsafe, based on a 50 μg/L arsenic detection limit. Second, the presence of an established network of NGOs and the availability of trained chemists made the use of spectrophotometers a viable proposition. Finally, it was clear that the problem of arsenic contamination was widespread rather than isolated, and that blanket testing of public supplies would lead to longer-term monitoring and eventually would include the testing of private water supplies. This would be affordable only if owners paid for testing, for which they would want to receive an accurate result. The fee charged for the test, roughly 80 rupees or US$ 1.60, covers the cost of the chemicals used, staff salaries and a small fee for the NGO.

Screening of all public hand pumps in 75 arsenic-affected blocks of West Bengal has been completed, with an overall accuracy of at least 80% (as verified by the referral laboratories). The NGOs involved are now stimulating demand for private testing, based on their experience in marketing sanitation. UNICEF is also supporting the upgrading of the twenty laboratories so that they can test other parameters including total dissolved solids, nitrate, iron and faecal coliform, thus providing household, communities and local government with a complete testing facility. Currently household filters are promoted state wide, through interpersonal communication, using the NGOs that gained experience through the sanitary marts outreach.

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Module on Water, Sanitation and Food

Monitoring and evaluation can be supplemented with appropriate research, including using qualitative methods to assess unmet needs and various financial and non-financial barriers that poor men and women may face when accessing clean water, adequate sanitation and safe food.

Foodborne diseases surveillance, which is essential to detect and respond to outbreaks, needs to be designed and carried out in a manner that ensures low-income communities and marginalized groups are covered. Investigations to identify the source and cause of outbreaks should ensure that low-income communities, ethnic minorities and other marginalized groups are considered. Similarly, in seeking to identify the source and cause of an outbreak, the different roles of men and women should be assessed.

More recently, efforts to extend the use of clean water and adequate sanitation have started to rely on maps and surveys that enable communities to look at their situation, analyse their problems and identify solutions. This method of data collection can also strengthen the ability of communities to articulate their concerns and demands to local authorities. In urban poor communities or remote rural areas, these maps may represent the first time that a household has been officially recorded, along with the housing type and plot boundaries. Techniques may include a count of huts, household surveys and settlement profiles. All data collection instruments are discussed with communities and modified based on their input. Similarly, all data are fed back to and verified with the community. The data generated through these exercises remain with the community, as a knowledge base each community owns and can control (see Box 28).

As noted earlier, equity-focused research should be used to fill gaps in the analyses generated by national health systems and national food safety systems. By focusing such research on issues specific to the experience of low-income communities, ethnic minorities or other marginalized populations, important insights can be gained that can inform the more effective and equitable use of scarce resources. It is also critical that the needs, concerns and experiences of both men and women are researched. Studies that incorporate a concern for gender can better ensure that men and women benefit equitably from the human and financial resources dedicated to research. Studies can raise questions that reveal gender bias in the design and delivery of clean water and adequate sanitation. Such research can also reveal the impact of national food safety systems and related interventions on men as compared with women.

In particular, there is a critical need for studies of food safety issues in the Region to augment the limited understanding of these issues from a poverty and gender perspective. Research is needed to show how different groups in society experience risks and risk factors and how opportunities to mitigate such risks are distributed across these different groups. Differences between men and women must also be considered. Attention needs to be given to ensuring that such studies examine both emerging problems and issues of concern to ensure a longer-term, sustainable approach to food safety. This should include analyses of the structure of food safety systems and the environments within which people act and make decisions that impact upon safety of the food chain. These studies should be used to inform efforts to refine and further strengthen national food safety systems and other interventions related to food safety in the Region.

...
5. Facilitators’ notes
5. Facilitators’ notes

These notes are provided to support facilitators as they work with learners on integrating poverty and gender issues into specific health topics. Facilitators are recommended to refer to Section 5 of the foundational modules of this Sourcebook, dealing respectively with poverty and gender, which contain additional notes on the target audience, role of the facilitator and suggested methodologies for learning sessions and for evaluation.

The learning sessions and exercises that follow are practical and oriented toward active learning. They are designed to promote group discussion and presentation in analysing water, sanitation and food safety health in terms of gender and poverty. The time required for all learning sessions is approximately 8 hours.

Expected learning outcomes

Upon completion of this module, participants will be able to:

- demonstrate an understanding of clean water, adequate sanitation and safe food, including measurement challenges and the global burden of mortality and morbidity related waterborne and foodborne hazards and diseases;
- demonstrate an understanding of WHAT the links are between poverty, gender and water, sanitation and food;
- explain WHY it is important for health professionals to address poverty and gender concerns in clean water, adequate sanitation and safe food initiatives;
- indicate HOW health professionals and the health system as a whole can address poverty and gender in clean water, adequate sanitation and safe food interventions; and
- demonstrate familiarity with some tools, resources and references available to support health professionals in dealing with poverty and gender in clean water, adequate sanitation and safe food initiatives.

Activity 1: How poverty and gender influence water, sanitation and food

Time required: 4.5 hours

Preparation:

- Set up a resource table (see list of resources in Section 6 of this Module) for participants to review.
- Provide copies of tables and graphs of relevance.

Resource table: Place a table in the back of the room. Place resources on the table and allow participants to look them over during the workshop. Materials for the table could include those listed in the resources and reference section of this model, among those available to the facilitators.

Learning activities:

Step 1. Participatory presentation: 60 minutes

Ask the participants to define ‘clean or improved water’, ‘safe food’, and ‘adequate or improved sanitation’. Write their answers on a blackboard or white paper. Through discussion, arrive at a common definition.

Step 2. The extent of the problem

Distribute the tables and figures from Section 1 of this module as well as those available to the facilitator from additional resources. Ask the participants to review the figures and tables and to answer the following questions:

- What percentage of the world’s population has access to safe water? to improved sanitation?
- Which Region of the world has the most people without access to improved water? to improved sanitation?
- What has happened between 1990 and 2000 in rural areas and in urban areas with respect to safe water? with respect to adequate sanitation?
- How frequent are foodborne and diarrhoeal diseases worldwide?
- What can you say about the interface...
between gender roles, gender inequalities and access to safe water? access to improved sanitation? food safety?

**Step 3. Small group work**

Divide the participants into groups of four to five people (probably four groups). The groups are free to use any of the materials on the resource table. Have Groups 1 and 2 discuss (separately) how lack of water and sanitation can lead to disease. Advise them to think of many pathways. Next, have them discuss what can be done to prevent disease. After 20 minutes, have groups 1 and 2 join and share their ideas. Have them come up with one list of final points (15 minutes).

Have Groups 3 and 4 discuss (separately) how unsafe food handling from production to consumption can lead to disease. Advise them to think of as many ways as possible. Next, have them discuss what can be done to prevent disease. After 20 minutes have groups 3 and 4 join and share ideas. Have them come up with one list of final points (15 minutes).

**Step 4. Small group presentations**

Have Groups 1 and 2 present their findings on the health risks of lack of water and sanitation. Discuss the findings with the larger group. Ask for comments and additions from the other participants. As the facilitator, fill in any gaps in the discussion to ensure that all of the main points are covered.

Then, have Groups 3 and 4 present their findings on the health risks of unsafe food handling from production to consumption. Discuss the findings with the larger group. Ask for comments and additions from the other participants and, as before, fill in any gaps in the discussion to ensure that all of the main points are covered.

**Step 5. Group discussion**

Ask the participants how poverty affects access to and use of safe water, improved sanitation and safe food. Write answers on white paper in front of the group. At the same time, keep the discussion going. Give clues to the group if they have missed something, but encourage them to think about the issues.

Then, distribute Figure 17: Links between poverty and food, water and sanitation for review.

Ask the participants how gender—including men’s and women’s roles, differences between them in access to and control over resources and inequalities between them in decision-making power—affects access to and use of safe water, improved sanitation and safe food. As before, write their answers on a white piece of paper at the front of the room. At the same time, keep the discussion going and give clues to encourage the group to think about issues they may have missed.

**Step 6. Summary**

Ask a participant to lead a short group discussion to review the extent of the problem. How many people in the world are without access to improved water and sanitation or are more exposed to unsafe food? Where do most of them live? Do these people live in cities? rural areas? Are they rich? poor? Then, ask another participant to lead a group discussion to review how lack of water, lack of sanitation or exposure to unsafe food can lead to disease. Ask a third participant to lead a group discussion to review how poverty and gender interface with lack of access to water, sanitation, inadequate hygiene and food safety.

**Activity 2: Poverty, gender and water, sanitation and food: why?**

**Time required:** 2.5

**Preparation:**
- Set up a resource table (see list of resources in Section 6 of this Module) for participants to review.
- Provide copies of reports on projects demonstrating good practices.
**Resource table:** Place copies of relevant United Nations resolutions, International Council on Nutrition resolution from 1992, covenants, Participatory Rural Appraisal (PRA) materials, project reports, etc. on the table for the duration of the workshop.

**Learning activities:**

**Step 1. Small group discussions**

First, divide the group into small groups of four to five people. The groups are free to use any resources on the resource table. Ask each group to discuss the following questions:

1. Is access to clean water a human right? If yes, why? If no, why?
2. Is access to safe food a human right? If yes, why? If no, why?
3. Is access to a sanitary facility a human right? If yes, why? If not, why?
4. What is the responsibility of the government in providing water?
   - Are most fees for water subsidized? Does this benefit the rich or the poor?
   - What about poor people who are not hooked up to municipal lines? Are they paying more? If yes, why? Is this fair?
   - What about people who choose to live in areas of water scarcity? Should the government provide water? Should they pay more to reflect real costs?
   - How does paying for water affect use?

Each group should discuss these points and try to come to consensus. One member of the group should be tasked to write the main points of their discussion on a piece of white paper.

**Step 2. Group presentations**

Place the white papers on the walls around the room and then ask the first group to present their conclusions for question 1. Following their presentation, ask the larger group for other opinions. Does another group have other thoughts? Discuss among the larger group. Continue to ask each of the groups to present their answers to each of the questions in turn. Please note that there may not be consensus on every issue; this is all right. Guide the participants to further reading from the list of additional resources.

**Step 3. Summary**

Ask one of the participants to summarize the following points:

- reasons why access to water, safe food and sanitation are considered human rights;
- relevance of poverty and gender issues to water, food, sanitation and hygiene; and
- how programmes should be planned and implemented to respond to those most in need.

**Activity 3: What can health professionals do to address poverty and gender concerns in clean water, adequate sanitation and safe food?**

**Time required:** 3.75 hours

**Preparation:**

- Set up a resource table (see list of resources in Section 6) for participants to review.
- Provide copies of national water and sanitation studies, health and nutrition studies, e.g. demographic and health surveys, UNICEF situation analysis.
- Provide copies of water, sanitation, food safety and hygiene projects in the country (governmental and nongovernmental).
- Prepare a bar graph, table or pie chart, illustrating the percentage of people with...
access to water and sanitation in your country, broken down by rural versus urban location, if possible.

**Resource table:** Set up the resource table in the back of the room. Place all the resources you have gathered on the table, plus copies of any water, sanitation, or food hygiene studies, etc. Urge the participants to look over the resources and studies while they are formulating approaches in their small groups.

**Learning activities:**

**Step 1. Presentation/group discussion**

Ask the participants if they can tell you what percentage of people in their country has access to safe food, clean water and adequate sanitation. Listen to the answers and then present the data from national studies. Analyse the data in the group discussion and identify where the gaps lay, rural/urban discrepancies, etc.

Then, identify four or five problem areas and write them down on a large piece of paper posted on a wall or flip chart stand in front of the group. Examples may be:

- rapid urbanization and slums without safe food and water or sanitation;
- rural areas without improved water, water scarcity, women spending hours fetching water and fuel;
- food outbreaks increasing and more food vendors in cities;
- inadequate training of health professionals in food outbreak investigation and behaviour change/communication techniques;
- high level of malnutrition and micronutrient deficiency in school-age population due to poor feeding, diarrhoea, worm infestation; and
- lack of participation of low-income communities, women or minority groups.

**Step 2. Small group discussions**

Divide the participants into five groups (four to five participants per group). Give each group one of the problems identified. Then, ask each of the groups to discuss what is being done nationally and in communities (e.g. by governments and nongovernmental organizations). Specifically, ask groups to:

- analyse how poverty or gender may affect the problem;
- identify what is currently being done in the country to address the problem; and
- make recommendations on what can be done at the national level, health institution level, community level, and health professional level.

**Step 3. Presentations in the large group**

Each group presents their work. Following each presentation, lead a discussion among the larger group on the small group’s work and their ideas.

**Step 4. Summary**

Lead a participatory discussion to summarize the main points:

- the key water, food, sanitation and hygiene problems in the country;
- how poverty and gender influence each of the problems;
- why it is crucial to address gender and poverty issues when programming;
- what methods are effective to approach communities; and
- how health professionals can help.

**Activity 4: Reflection and evaluation**

**Time allotted: 30 minutes**

**Step 1. Reflection on the teaching/learning experience**

At the beginning of this closing session, the facilitator should summarize his or her own impressions about the course as well as the learning and participation of the students. Overall, this summary can be general, but specific examples should be provided for participants to reflect upon their learning. Participants should
then be provided with an opportunity to reflect on their own learning. This can be facilitated by the facilitator by using the following prompts:
1. When you think back over the course, what stands out for you most?
2. Do you think you might be able to incorporate issues of poverty and gender into your health care practice and/or responsibilities?
3. If you do not directly work in the area of food, water and sanitation, can you see the value of taking such a course? If so, why? If not, why not?

This final discussion is important for students to look back over their entire learning experience. Such reflection also helps bring closure for participants. This is also a time for participants to examine if they believe this learning might influence their future practice.
6. Tools, resources and references
## 6. Tools, resources and references

### Tools

#### 1. Five keys to safer food

<table>
<thead>
<tr>
<th>Key Clean</th>
<th>Why?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wash your hands before food handling and often during food preparation.</td>
<td>While most microorganisms do not cause disease, dangerous microorganisms are widely found in soil, water, animals and people. These microorganisms are carried on hands, wiping cloths and utensils, especially cutting boards, and the slightest contact can transfer them to food and cause foodborne disease.</td>
</tr>
<tr>
<td>Wash your hands after going to the toilet.</td>
<td></td>
</tr>
<tr>
<td>Wash and sanitize all surfaces and equipment used for food preparation.</td>
<td></td>
</tr>
<tr>
<td>Protect kitchen areas and food from insects, pests and other animals.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Separate raw and cooked foods</th>
<th>Why?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Separate raw meat, poultry and seafood from other foods.</td>
<td>Raw food, especially meat, poultry and seafood, and their juices, can contain dangerous microorganisms that may be transferred on to other foods during food preparation and storage.</td>
</tr>
<tr>
<td>Use separate equipment and utensils such as knives and cutting boards for raw foods.</td>
<td></td>
</tr>
<tr>
<td>Store food in containers to avoid contact between raw and prepared foods.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cook food thoroughly</th>
<th>Why?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cook food thoroughly, especially meat, poultry, eggs and seafood.</td>
<td>Proper cooking kills almost all dangerous microorganisms. Studies have shown that cooking food to a temperature of 70ºC can help ensure it is safe for consumption. Foods that require special attention include minced meats, rolled roasts, large joints of meat and whole poultry.</td>
</tr>
<tr>
<td>Boil soups, stews and similar foods to make sure that they have reached 70ºC. For meat and poultry, make sure that juices are clear, not pink. Ideally, use a thermometer.</td>
<td></td>
</tr>
<tr>
<td>Reheat cooked food thoroughly.</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Keep foods at safe temperatures</th>
<th>Why?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not leave cooked food at room temperature for more than 2 hours.</td>
<td>Microorganisms can multiply very quickly if food is stored at room temperature. By holding at temperatures below 5ºC or above 60ºC, the growth of microorganisms is slowed down or stopped. However, some dangerous microorganisms still grow below 5ºC.</td>
</tr>
<tr>
<td>Refrigerate promptly all cooked and perishable food (preferably below 5ºC).</td>
<td></td>
</tr>
<tr>
<td>Keep cooked food piping hot (more than 60ºC) prior to serving.</td>
<td></td>
</tr>
<tr>
<td>Do not store food too long even in the refrigerator.</td>
<td></td>
</tr>
<tr>
<td>Do not thaw frozen food at room temperature.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Use safe water and raw materials</th>
<th>Why?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use safe water or treat it to make it safe.</td>
<td>Raw materials, including water and ice, may be contaminated with dangerous microorganisms and chemicals. Toxic chemicals may be formed in damaged and mouldy foods. Care in selection of raw materials and simple measures such as washing and peeling may reduce the risk.</td>
</tr>
<tr>
<td>Select fresh and wholesome foods.</td>
<td></td>
</tr>
<tr>
<td>Choose foods processed for safety, such as pasteurized milk.</td>
<td></td>
</tr>
<tr>
<td>Wash fruits and vegetables, especially if eaten raw.</td>
<td></td>
</tr>
<tr>
<td>Do not use food beyond its expiry date.</td>
<td></td>
</tr>
</tbody>
</table>

## 2. A typology of communities with low water supply and sanitation coverage

<table>
<thead>
<tr>
<th>Density</th>
<th>Dispersed (rural)</th>
<th>Medium (village, small town)</th>
<th>Dense (urban/peri-urban)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing infrastructure</td>
<td>Little/no improved infrastructure</td>
<td>Type I: dispersed, little/no improved infrastructure</td>
<td>Type III: medium density, little/no improved infrastructure</td>
</tr>
<tr>
<td>Low-functioning improved infrastructure</td>
<td>Type II: dispersed dysfunctional improved infrastructure</td>
<td>Type IV: medium density, dysfunctional improved infrastructure</td>
<td>Type VI: high density, dysfunctional improved infrastructure</td>
</tr>
</tbody>
</table>

Source: UN Millennium Project, 2005a.
### 3. Typology of unserved and underserved communities for water supply

<table>
<thead>
<tr>
<th>Density</th>
<th>Existing service</th>
<th>Proximate explanations</th>
<th>Possible policy and planning responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>I Dispersed</td>
<td>Little or no improved infrastructure: supply from vendors and surface water sources</td>
<td>Supply side</td>
<td>Demand side</td>
</tr>
<tr>
<td>(rural)</td>
<td>• Limited public investment in rural water supply</td>
<td>• Poverty</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Perception of poverty</td>
<td>• Limited access to credit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• High per capita cost</td>
<td>• Challenges of collective action</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Low demand: availability of acceptable alternatives</td>
<td></td>
</tr>
<tr>
<td>II Dispersed</td>
<td>Inadequate supply from shared public facilities, such as borewells with hand pumps</td>
<td>Supply side</td>
<td>Demand side</td>
</tr>
<tr>
<td>(rural)</td>
<td>• Limited investment in operations, maintenance, and expansion</td>
<td>• Poverty</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Perception of poverty</td>
<td>• Limited access to credit</td>
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<td>• Challenges of collective action</td>
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<td>• Low demand: availability of acceptable alternatives</td>
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</tr>
<tr>
<td>III Medium</td>
<td>Supply from private household facilities, vendors, and surface water sources</td>
<td>Supply side</td>
<td>Demand side</td>
</tr>
<tr>
<td>density</td>
<td>• Limited public and private investment available for small town water supply</td>
<td>• Limited access to credit</td>
<td></td>
</tr>
<tr>
<td>(small town)</td>
<td>• Policy vacuum</td>
<td>• Demand captured by private household investment</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV Medium</td>
<td>Supply from dysfunctional public networks</td>
<td>Supply side</td>
<td>Demand side</td>
</tr>
<tr>
<td>density</td>
<td>• Inadequate resources and capacity for operation and maintenance of public system</td>
<td>• Limited potential for use of voice</td>
<td></td>
</tr>
<tr>
<td>(small town)</td>
<td>• Policy vacuum</td>
<td>• Unwillingness to pay higher tariffs for low quality service</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Higher-income households may exit system</td>
<td></td>
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</tbody>
</table>

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<table>
<thead>
<tr>
<th>Density</th>
<th>Existing service</th>
<th>Proximate explanations</th>
<th>Possible policy and planning responses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>V</strong> High density (urban or periurban)</td>
<td>Little or no improved infrastructure: supply from vendors</td>
<td>• Growth (newly incorporated areas). &lt;br&gt;• Investment restrictions in unregularized areas &lt;br&gt;• High per capita cost &lt;br&gt;• Perceptions of poverty &lt;br&gt;• Constraining standards</td>
<td>• Urban development policy reform &lt;br&gt;• Promotion of small-scale independent providers &lt;br&gt;• Partnerships with civic organizations &lt;br&gt;• Targeted subsidy and credit programmes</td>
</tr>
<tr>
<td><strong>VI</strong> High density (urban or periurban)</td>
<td>Supply from shared public facilities</td>
<td>• High per capita cost of supply &lt;br&gt;• Perceptions of poverty &lt;br&gt;• Constraining standards</td>
<td>• Urban development policy reform &lt;br&gt;• Promotion of small-scale independent providers &lt;br&gt;• Partnerships with civic organizations &lt;br&gt;• Targeted subsidy and credit programmes</td>
</tr>
</tbody>
</table>

Source: UN Millennium Project, 2005a.
### 4. Typologies of unserved and underserved communities for sanitation

<table>
<thead>
<tr>
<th>Density</th>
<th>Existing service</th>
<th>Proximate explanations</th>
<th>Possible policy and planning responses</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Supply side</td>
<td>Demand side</td>
</tr>
<tr>
<td>I Dispersed</td>
<td>Little or no improved infrastructure: open defecation</td>
<td>No institutional home for sanitation</td>
<td>Poverty</td>
</tr>
<tr>
<td>(rural)</td>
<td></td>
<td>Low priority and limited public investment in rural sanitation</td>
<td>Limited access to credit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Low demand for sanitation improvements</td>
</tr>
<tr>
<td>II Dispersed</td>
<td>Service from dysfunctional private facilities, such as latrines</td>
<td>No institutional home for sanitation</td>
<td>Poverty</td>
</tr>
<tr>
<td>(rural)</td>
<td></td>
<td>Limited post-construction support for sanitation</td>
<td>Limited access to credit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Limited private sector skills for operation and maintenance</td>
<td>Low demand for sanitation improvements</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mismatch between levels of service supplied and demanded</td>
<td></td>
</tr>
<tr>
<td>III Medium</td>
<td>Service from dysfunctional private and public facilities, open defecation</td>
<td>No institutional home for sanitation</td>
<td>Limited access to credit</td>
</tr>
<tr>
<td>density</td>
<td></td>
<td>Limited resources available for operation and maintenance</td>
<td>Limited demand for sanitation</td>
</tr>
<tr>
<td>(small town)</td>
<td></td>
<td></td>
<td>improvements</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Constraining standards for service improvements</td>
<td>Demand captured by private household</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>investment</td>
</tr>
<tr>
<td>IV Medium</td>
<td>Service from dysfunctional private facilities</td>
<td>No institutional home for sanitation</td>
<td>Limited access to credit</td>
</tr>
<tr>
<td>density</td>
<td></td>
<td>Limited post-construction support for sanitation</td>
<td>Limited demand for sanitation</td>
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<tr>
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### Typologies of unserved and underserved communities for sanitation (continued)

<table>
<thead>
<tr>
<th>Density</th>
<th>Existing service</th>
<th>Proximate explanations</th>
<th>Possible policy and planning responses</th>
</tr>
</thead>
</table>
| V       | High density (urban or periurban) | Little or no improved infrastructure: open defecation or use of facilities in other neighbourhoods | • No institutional home for sanitation  
• Growth (newly incorporated areas)  
• Investment restrictions in unregularized areas  
• High per capita cost of service  
• Perceptions of poverty  
• Constraining standards | • High proportion of rented dwellings  
• Insecure tenure  
• Limited access to credit  
• Poverty  
• Low demand for sanitation improvements | • Land tenure reform  
• Social marketing and education  
• Partnerships with civic organizations  
• Regulatory reform (standards, new construction)  
• Innovative technologies |
| VI      | High density (urban or periurban) | Service from shared public facilities | • No institutional home for sanitation  
• High per capita cost of household level supply  
• Perception of poverty  
• Constraining standards  
• Limited funding and incentives for operation and maintenance | • High proportion of rented dwellings  
• Limited access to credit  
• Poverty  
• Low demand for sanitation improvements | • Land tenure reform  
• Social marketing and education  
• Partnerships with civic organizations  
• Regulatory reform (standards, new construction)  
• Innovative technologies |

**Source:** UN Millennium Project 2005a.
5. Hand-washing

The most important thing that you can do to keep from getting sick is to wash your hands. By frequently washing your hands, you wash away germs that you have picked up from other people, from contaminated surfaces, or from animals and animal waste.

What happens if you do not wash your hands frequently?

If you do not wash your hands, you may pick up germs from other sources and then infect yourself when you touch your eyes, nose or mouth.

One of the most common ways people catch colds is by rubbing their nose or their eyes after their hands have been contaminated with the cold virus.

You can also spread germs directly to others or onto surfaces that other people touch. Before you know it, everybody around you is getting sick.

It is important to remember that, in addition to colds, some serious diseases – like hepatitis A, meningitis, and infectious diarrhoea – can be easily prevented if people make a habit of washing their hands.

When should you wash your hands?

You should wash your hands often, probably more often than you do now, because you can’t see or smell germs. You do not really know where they are hiding.

It is especially important to wash your hands:

• before, during, and after you prepare food;
• before you eat, and after you use the bathroom;
• after handling animals or animal waste;
• when your hands are dirty; and
• more frequently when someone in your home is sick.

What is the correct way to wash your hands?

• First, wet your hands and apply liquid or clean bar soap. Place the bar soap on a rack and allow it to drain.
• Next, rub your hands vigorously together and scrub all surfaces.
• Continue for 10–15 seconds or about the length of a little tune. It is the soap combined with the scrubbing action that helps dislodge and remove germs.
• Rinse well and dry your hands.

An estimated one out of three people do not wash their hands after using the restroom. For this reason, these tips are especially important when you are out in public.
6. International declarations and covenants relevant for clean water, adequate sanitation and safe food

- Universal Declaration of Human Rights, 1948
- International Covenant on Economic, Social and Cultural Rights, 1966
- Convention on the Elimination of all Forms of Discrimination (CEDAW), 1979
- Beijing Declaration and Platform of Action, 1995
- Millennium Development Goals, 2000
- Johannesburg Summit Declaration and Goals, 2002

Resources

The World Health Organization (www.who.int) has a range of resources and publications on clean water, adequate sanitation and food safety. The Regional Office for the Western Pacific (www.wpro.who.int) offers information and resources specific to the Western Pacific Region.

The World Bank (www.worldbank.org) has resources on water and sanitation. Resources on urban upgrading for urban poor communities provide information on the effective delivery of services to urban poor communities (http://web.mit.edu/urbanupgrading/)

UNICEF (www.unicef.org) collects and analyses data on water and sanitation and the burden of childhood diseases related to water.

The Asian Development Bank (www.adb.org) has a website dedicated to water and sanitation in the Asia and Pacific Region.

UNESCAP Expert Group Meeting on Developing Supplementary Targets and Indicators on Social Inclusion, Population, Gender Equality and Health Promotion to Strengthen the MDGs Process (www.unescap.org/esid/hds/development_account/schedule_of_meetings.asp#egm07).

Other institutions dedicated to water and sanitation are:

- International Water and Sanitation Center (www.irc.nl)
- Water and Sanitation Department at the Swiss Federal Institute of Science and Technology (www.sandec.ch)
- Water and Sanitation Program – International Partnership (www.wsp.org)
- Water Supply and Sanitation Collaborative Council (www.wsscc.org)
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Radoki C. What are the most effective strategies for understanding and channeling the preferences of service users to make public services more responsive? Background paper for the World Development Report 2004, 2003.


ENDNOTES

4 UN Millennium Project 2005a.
9 UN Millennium Project 2005a.
12 The Codex Alimentarius and WHO include drinking water in the definition of food.
14 Please note that these regional classifications are used by UNICEF and not by WHO.
17 World Health Organization for the Western Pacific undated d.
20 Bearak B. 2002. Note: In 1984, in the Indian city of Bhopal, 40 tonnes of lethal gas leaked from the Union Carbide pesticide factory causing the worst chemical disaster in history, with 8000 dead in the first three days, 30 000 dead in the 18 years since the accident, and 150 000 chronically ill survivors. In 1986, in Chernobyl, formerly in the Soviet Union and now in the Ukraine, the world’s worst nuclear accident to date occurred when radiation leaked from a reactor. Thirty people died immediately; another 2500 died thereafter. About 135 000 people were exposed to high radiation levels and had to be evacuated.
21 World Health Organization 2002b.
22 World Health Organization 2002b and Ezzati A. et al. 2002
23 World Health Organization Regional Office for the Western Pacific undated b.
24 World Health Organization Regional Office for the Western Pacific unpublished.
25 World Health Organization Regional Office for the Western Pacific undated a.
26 See, for example, Lightfoot C., Ryan T. 2001. The vulnerability of many Pacific island developing nations to external shocks (including natural disasters and market failures) and their small resource base have led to their inclusion among the Least Developed Countries. Please see the website of the United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States for more information:
31 The level of development is analysed by clustering countries according to the World Bank classifications: low-income, lower-middle income, upper-middle income and high income.
34 Satterthwaite D., McGranahan G. 2006.
37 Chompook et al. 2006.
50 UN Millennium Project 2005a.
52 UN Millennium Project 2005b.
In contrast, households in European countries use an average of 200–300 litres per person per day, while those in the United States of America use 575 litres per day.
Integrating Poverty and Gender into Health Programmes: A Sourcebook for Health Professionals

Collaborative Council 2006.


Coates S. 1999.

Coates S. 1999.


Rashed S. et al. 1999.


Li J. 2004.


Satterthwaite D., McGranahan G. 2006.


World Health Organization Department of Gender and Women’s Health 2004.


Itai-itai disease (itai means great pain in Japanese) was first reported to the Japanese Medical Society in 1946. It took 20 years to confirm that the disease was caused by excessive exposure to cadmium leaked into the water supply from a mine.


Hutton G. et al. 2006.


Calaguas B. 1999.


World Health Organization Regional Office for the Western Pacific unpublished.

World Health Organization Regional Office for the Western Pacific undated e.


UN Millennium Project 2005a.


UN Millennium Project 2005b.


World Health Organization Regional Office for the Western Pacific 2003a.

For more information on the Commission on Social Determinants of Health, please see: http://www.who.int/social_determinants/en/.

World Health Organization 2004c. A review of PRSPs undertaken by the World Health Organization found that, although the value of a cross-sectoral approach to health is often recognized in the health section of PRSPs, little evidence is available to show that this concern is translated into strategy.

Gutierrez E. et al. 2003.

Gutierrez E. et al. 2003.

World Health Organization Regional Office for the Western Pacific 2003b.

World Health Organization Regional Office for the Western Pacific 2003b.


United Nations Development Programme 2006; UN Millennium Project 2005a; UN Millennium Project 2005b.


UN Millennium Project 2005a.

UN Millennium Project 2005a.


UN Millennium Project 2005a.

Curtis V. et al. 2001.

UN Millennium Project 2005b.

UN Millennium Project 2005a.


UN Millennium Project 2005a.


UN Millennium Project 2005b.
