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GUIDANCE DOCUMENT

WASH 4WORK

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CONTENTS

I. BUSINESS CONTRIBUTION TO WASH

1.1 Water, Sanitation and Hygiene are Important for Healthy Living for Everyone

In 2010, the UN General Assembly recognized access to clean water and sanitation as a human right. The right to safe drinking water, sanitation and hygiene is also fundamental to the realization of the right to health and well-being, including the right to healthy working conditions and the environment (International Covenant on Economic, Social and Cultural Rights). Lack of access to safe drinking water and sanitation will also reduce the capacity of the rural poor to move out of poverty and hinder gender equality (ILO Report IV 2008).

In 2015 all governments in the world are committed to achieving the target of the 6th sustainable development goal (SDG) namely universal access to clean water and sanitation by 2030. The Government of Indonesia is responding to this global call by prioritizing access to water, sanitation and hygiene (WASH) in the National Medium-term Development Plan 2020-2024. But despite recent gains, millions of Indonesians still go without safe and sustainable access to water and sanitation. As a result, millions of Indonesian children suffer from preventable diseases, like diarrhea, limiting their growth and cognitive development.

In an effort to accelerate the achievement of SDG 6, the role of the private sector is highly expected. The private sector in Indonesia impacts millions of people every day. Private sector businesses touch the lives of those who work in their factories, farms, shops, and offices, who supply and distribute their goods, and their customers. Therefore, the workplace becomes the main focus in the lives of workers and employers so that access to WASH in the workplace can make a major contribution to both occupational health and general health. However, limited knowledge in middle and low income countries about WASH in non-household environments, such as the workplace suggests that WASH access in the workplace is lower than in the household (Cronk et al., 2015). Even during the COVID-19 pandemic, the role of clean water and good hygiene practices has never been more important. In the workplace, ensuring that workers have water, sanitation and hygiene is an investment in the long-term health of the workforce and overall business resilience. As workers prepare to return to offices, factories, shops, farms, markets and other workplaces, WASH facilities are essential for a safe return to work, preventing the spread of disease, and ensuring a decent work environment for workers.

1.2 WASH4Work Coalition

The WASH at the Workplace pledge, an initiative from the World Business Council on Sustainable Development (WBCSD) – a global, CEO-led organization of over 200 leading businesses working together to accelerate the transition to a sustainable world, originally developed in 2013 allowed companies to commit to and implement access to safe water, sanitation and hygiene at an appropriate level of standard for their employees at all company premises within their control. By committing to the WASH Pledge, business can

contribute to achieving SDG's his goal while reaping the benefits of a healthier, more productive workforce. They can also improve access to WASH through their value chains and communities.

Enhanced worker productivity is a central argument for WASH-related provisions in the workplace. The WHO (2012) estimates that investments in sanitation bring four-fold economic returns in increased health and productivity. For example, dehydration quickly reduces physical and mental ability, thus reducing productivity and increasing the risk of accidents. There is increasing evidence that even mild dehydration can play a role in various morbidities and good hydration has been shown to reduce the risk of various health risks (Manz 2007). WBCSD presents the business case to potential signatory companies around a range of arguments, including: reduced absenteeism and higher productivity, increased brand value and license to operate, as well as the 'big picture' argument that economies with higher proportions of people with WASH access tend to enjoy higher growth. The businesses are encouraged to commit to the Pledge, gauge their performance on WASH access in comparison to international best practice, and play their part in ensuring safe WASH access, thus making a direct contribution to addressing one of the most pressing public health challenges of our times.

The WASH Pledge has been updated in partnership with the WASH4Work initiative. WASH4Work is a coalition of organizations that work together to mobilize business to improve access to water, sanitation and hygiene in their workplaces, in the communities where workers live and across their supply chains. The WASH4Work is an opportunity for business to implement international best practice on WASH for their employees at the workplace as well as along its value chains and communities.

The overarching goal of WASH4Work is that all employees globally have access to safe, adequate and equitable WASH in their places of work. One of the key objectives of WASH4WORK is to enable all businesses to make a meaningful contribution to SDG6, in a way that generates business value. Specifically, roles of the business in providing WASH through WASH4Work initiative are:

- Ensuring delivery of WASH services directly to employees;
- Influencing or working with stakeholders to provide access to WASH for workers in supply chains and communities;
- Managing water consumption and discharge of water as a cornerstone of water stewardship through on-site and catchment-based action.

Achieving the above objectives requires coordinated efforts by government, workers and employers, at various levels. The WASH4Work initiative will open up opportunities for greater engagement for companies to ensure workers' access to clean water, sanitation and hygiene in the workplace, along the supply chain and ultimately benefit the communities where workers live.

1.3 Current Conditions of WASH Access at Work Places in Indonesia

Efforts to map the current condition of WASH access in the workplace is an important first step for companies when making efforts to improve WASH access in the workplace. UNICEF and the Directorate of Occupational Safety and Health Testing of the Ministry of Manpower have conducted a survey to map WASH conditions in the workplace during the period from December 20, 2021 to January 20, 2022. The data collection process was carried out by the Directorate team with OHS staff appointed by the company as survey respondents. During this period, as many as 45 manufacturing companies in Jakarta were surveyed with 37 of them being large companies (with >99 employees) in the form of limited liability companies (PT), 5 medium-sized companies (20 – 99 employees).), and 3 small companies.

The mapping of workers' access to WASH facilities in the workplace in this survey was carried out by selecting the factory work location as the main survey target location. The priority of factory work locations is due to the high number and interaction of workers at factory work sites so that the fulfillment of workers' access to WASH in factories is very important for the safety and health of workers.

There are 4 (four) aspects of mapping WASH conditions in the workplace that were explored through this survey, namely 1) Business Commitment to WASH, 2) Awareness of WASH among Management and Employees, 3) Access to and Use of Improved WASH Facilities at Worksite Facility / Locations, and 4) Companies Awareness to Climate Change, Social Responsibility Program and Disaster Emergency Response. In the following section, a summary of conditions for access to WASH in the workplace is presented based on the survey findings. (Full information on Mapping WASH Conditions in the Workplace in Indonesia can be seen in the report document jointly issued by UNICEF and the Indonesian Ministry of Manpower).

Business Commitment to WASH

- Permenaker (MoMP) No. 5/2018 has been widely mentioned as a regulatory reference on WASH access at work places as part of the provisions of the OSH Work Environment. However, all medium and small companies surveyed were not aware of this.
- Companies that are aware of government regulations regarding the fulfillment of WASH access in the workplace do not automatically have an internal company policy regarding this matter. For companies that already have an internal policy on WASH, it generally regulates the practice of washing hands with soap. There are still very few companies that have policies on Menstrual Hygiene Management.
- In general, companies that have internal regulations/policies that promote WASH at work sites have internal mechanisms within the company to monitor the implementation of the WASH policies.

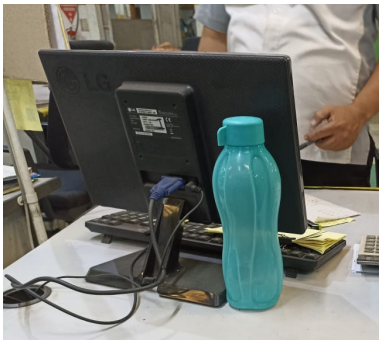
- The company's mechanism to ensure partners in its supply chain comply with WASH requirements in their workplace is through vendor agreement contracts, with some companies also conducting audits or inspections of vendor locations.
- Almost all companies know about the impact of WASH conditions in the workplace, especially on the health and productivity of workers. However, not many companies, even though they already have a mechanism for monitoring WASH conditions in the workplace, have a mechanism for collecting worker attendance data based on the type of illness.

Awareness of WASH among Management and Employees

- Even though businesses already have awareness and know about the benefits of WASH for workers and their businesses, they have not fully carried out educational/promotional activities for WASH behavior change to workers.
- Likewise, the company's knowledge about the conditions of WASH access in the neighborhood where the workers live and the surrounding community is not necessarily followed by the company's efforts to promote WASH to the surrounding community.

Access to and Use of Improved WASH Facilities at Worksite Facility / Locations

<u>Access to Water at Workplace</u>



- Even though the company states that it has provided free access to drinking water from safe sources for workers in factories, offices, and field work locations, the availability of drinking containers (such as glasses, tumblers) for workers at work during working hours is still a problem.
- Factories with many workers generally use water sources other than bottled water and/or water refill kiosks. The process of processing water from water sources into drinking water is carried out using filters (ceramic, etc.).
- Most of the work sites have not tested their own drinking water quality and safety standards, especially those who use drinking water sources from bottled water vendors and refill water kiosks. References to the quality and safety of drinking water are mainly sourced from data provided by vendors of bottled water providers and refill kiosks.

Sanitation at Workplace

- Factories with a large number of workers (>200 workers in one factory location) tend to have problems in providing access to toilets/latrines for workers.
- In addition, what still needs to be improved a lot in providing access to toilets/latrines at work sites is access to toilets/latrines for workers with disabilities.
- Although septic tanks are commonly used by companies as a means of disposing of fecal waste from toilets, further research needs to be done whether their septic tanks are in accordance with standards and have been managed safely considering the response of most companies that never emptied their septic tanks.

Hygiene at Workplace

- When sanitary napkins are not readily available at the factory (occurring in more than a third of factories surveyed) and require female workers to bring their own sanitary napkins, the unavailability of private places (lockers) to store sanitary napkins at the factory site adds to the difficulty for female workers during menstruation.
- Almost all surveyed factory, office, and field work sites have hand washing facilities with soap and water which also have reminder signs (such as posters, stickers, etc.) about important times to carry out hand washing with soap.

Awareness of Business Environmental Impact

- There are still many factories that do not have the awareness to treat wastewater according to standards. On-site treatment facilities are still commonly adopted by factories that already have wastewater treatment facilities.
- The water crisis due to climate change is experienced by a small number of companies which has an impact on company operations. However, the actions taken by these companies have not shown sustainable improvement and anticipation efforts in the context of climate change.
- Almost all companies, especially large companies, have CSR programs in the health and WASH sector targeting communities and households around the company's work locations. This shows the company's potential contribution to achieving the SDG targets.

II. REGULATION SUPPORTING WASH

2.1 International Labour Organization (ILO) Standards and Codes of Practice on Access to WASH

The ILO promotes decent work in all economic sectors, at the country level and in global supply chains. As part of this effort, ILO's member States and the social partners (employer and worker organizations) have adopted a broad array of international instruments to promote occupational safety and health (OSH). It is also the ILO's main contribution to the WASH4Work initiative, launched in the UN headquarters on World Water Day 2016 in collaboration with several UN-Water members and partners. This initiative seeks to create awareness among governments, employers and workers about these issues.

International labour standards are legal instruments drawn up by the ILO's constituents (governments, employers and workers) setting out basic principles and rights at work. They are either **Conventions**, which are legally binding international treaties that may be ratified by member States, or **Recommendations**, which serve as non-binding guidelines. In many cases, a Convention lays down the basic principles to be implemented by ratifying countries, while a related Recommendation supplements the Convention by providing more detailed guidelines on how it could be applied. Recommendations can also be autonomous, i.e not linked to any Convention.

Many of the plenary discussions for ILO Conventions highlighted the importance of WASH-related provisions as a means to increase productivity by reducing vector-borne diseases such as **the Hygiene (Commerce and Offices) Convention, 1964 (No. 120)**. **The ILO's OSH Conventions** contain provisions for access to safe drinking water, sanitation and hygiene. **The ILO's Occupational Safety and Health Convention, 1981 (No. 155)** defines the term health, in relation to work, as "not merely the absence of disease or infirmity; it also includes the physical and mental elements affecting health which are directly related to safety and hygiene at work." This definition is critical to provisions for the access to safe water, sanitation and hygiene, particularly due to the lack of clear distinction between working and living environment for workers in certain sectors, such as mining or agriculture. **The accompanying Recommendation (No. 164)** provides more precise indications for sanitary facilities and the provision of drinking water. "As appropriate for different branches of economic activity and different types of work and taking into account the principle of giving priority to eliminating hazards at their source, measures should be taken", among them "sanitary installations, washing facilities, facilities for changing and storing clothes, supply of drinking water, and any other welfare facilities connected with occupational safety and health."

Besides conventions and recommendations, the ILO adopts **Codes of Practice**, proposed by experts nominated by member States and by worker and employer organizations. These Codes provide guidance to apply the corresponding Conventions

and Recommendations, particularly in regards to maintaining the health of workers, and preventing – as far as is reasonably possible –water and sanitation-related diseases for all those engaged in each sector or working with hazardous substances. For example, the Code of Practice on Safety and Health in Agriculture suggests that OSH policies should include arrangements to communicate with the authorities responsible for the provision of water. The code of practice on Ambient factors in the workplace (2001) also holds employers responsible for the safety and health of workers, and urges that workers participate in decisions on occupational safety and health. They include practical recommendations for those responsible for occupational safety and health in each area of activity.

2.2 Law and Regulation Concerning Occupational Safety and Health in the Work Environment

Conventions and Recommendations are drawn up by representatives of governments, employers and workers and are adopted at the ILO's annual International Labour Conference. Once a standard is adopted, member States are required under the ILO Constitution to submit them to their competent authority (normally the parliament) for consideration. In the case of Conventions, this means consideration for ratification. If it is ratified, a Convention generally comes into force for that country one year after the date of ratification. Ratifying countries commit themselves to applying the Convention in national law and practice and to reporting on its application at regular intervals. Technical assistance is provided by the ILO if necessary. In addition, representation and complaint procedures can be initiated against countries for violations of a Convention they have ratified.

The Government of Indonesia through Law No. 3/1969 declared its approval of the International Labor Organization (ILO) Convention No. 120 Regarding Hygiene in Commerce and Offices (the Hygiene (Commerce and Offices) Convention, No. 120, 1964). To implement the provisions of Law Number 3 of 1969 as well as the provisions of Law Number 1 of 1970 concerning Occupational Safety, it is necessary to make a regulation concerning occupational safety and health in the work environment. There are two ministerial regulations related to occupational safety and health in the work environment, namely 1) **Regulation of the Minister of Health of the Republic of Indonesia Number 70 of 2016 concerning Standards and Requirements for Health of the Industrial Work Environment**, and 2) **Regulation of the Minister of Manpower of the Republic of Indonesia Number 5 of 2018 concerning Occupational Health and Safety. Work environment**.

In this Ministerial Regulation what is meant by **Occupational Safety and Health**, hereinafter abbreviated as K3, are all activities to guarantee and protect the safety and health of workers through efforts to prevent work accidents and occupational diseases. Meanwhile, **Occupational Safety and Health in the Work Environment**, hereinafter referred to as K3 in the Work Environment, are all activities to ensure and protect the safety and health of workers through controlling the work environment and implementing hygiene and sanitation in the workplace. In particular, **Industrial Work Environment Health** is an effort to prevent disease and/or health problems from risk factors in the

industrial work environment consisting of physical, chemical, biological, ergonomic, and sanitary hazard factors to realize a healthy industrial work environment quality. Management of health hazards in the industrial work environment as well as compliance with environmental health requirements is an important aspect in the implementation of an occupational health and safety management system. In general, the implementation of K3 requirements for the work environment aims to create a safe, healthy and comfortable work environment in order to prevent work accidents and occupational diseases.

A healthy industrial work environment is one of the factors that support increased performance and production which can simultaneously reduce the risk of health problems and occupational diseases. The industrial work environment must meet **the standards and requirements for the health of the industrial work environment** as the minimum requirements that must be met and implemented in the workplace. In particular, the setting of standards and requirements for the health of the industrial work environment above aims to:

- Realizing a healthy quality industrial work environment in order to create healthy and productive workers;
- Preventing health problems, occupational diseases, and work accidents; and
- Prevent the emergence of environmental pollution due to industrial activities.

Industrial work environment health standards and requirements consist of threshold values, biological exposure indicators, and industrial work environment health requirements.

- **Threshold value (*Nilai Ambang Batas – NAB*)** for physical/chemical factors is the average intensity/concentration of exposure to physical/chemical hazards that can be accepted by almost all workers without causing health problems or disease in their daily work for a time not exceeding 8 hours per day and 40 hours per week.
- **Biological Exposure Indicators (*Indikator Padanan Biologi – IPB*)** are reference values for the concentration of the absorbed chemical, the metabolites (metabolites) of the absorbed chemical, or the effects of the chemical which are used to evaluate exposure biological and potential health risks of workers.
- **Environmental health quality standards (*Standar Baku Mutu – SBM*)** are technical specifications or values standardized on environmental media that relate or have a direct impact on public health.

Industrial work environment health standards and requirements as regulated in the Regulation of the Minister of Health of the Republic of Indonesia Number 70 of 2016 concerning Industrial Work Environment Health Standards and Requirements are equipped with guidelines for the use of standards and requirements so that they can be a reference for all users in order to reduce the possibility of errors in use and interpretation. standards and requirements. The determination of standards and requirements for the health of the industrial work environment is focused on applications in industry so that it is expected to make it easier for users in the field, where in the Decree of the Minister of Health Number 1405/Menkes/SK/XI/2002 concerning Health Requirements for the Office and Industrial Work Environment, it does not only regulate industry. but also in the office. With the enactment of this Ministerial Regulation, it is hoped that it can become a

reference for all stakeholders in meeting the standards and requirements for the health of the industrial work environment.

Every industry is required to meet the standards and apply the health requirements of the industrial work environment. The industries referred to include:

- Industries with large businesses;
- Medium-sized enterprises;
- Industry with small businesses; and
- Industry with micro-enterprises.

To meet the standards and requirements for the health of the industrial work environment, each industry must conduct regular monitoring. Monitoring is carried out at least once a year, or every time there is a change in the process of industrial activities that have the potential to increase the level of health hazards in the work environment, and/or in accordance with the provisions of the legislation. Monitoring is carried out by personnel who have received education and/or training in the field of occupational health or industrial hygiene.

2.3 Law and Standards for Implementing Corporate Social and Environmental Responsibility

2.3.1 Law Number 40 of 2007 concerning Limited Liability Companies (*Undang-Undang Nomor 40 Tahun 2007 tentang Perseroan Terbatas*)

In Law Number 40 of 2007 it is regulated regarding Social and Environmental Responsibility which aims to realize sustainable economic development in order to improve the quality of life and the environment that is beneficial to the Company itself, the local community, and society in general. This provision is intended to support the establishment of a harmonious, balanced, and in accordance with the environment, values, norms and culture of the local community, it is determined that the Company whose business activities are in the field of and/or related to natural resources is obliged to carry out Social Responsibility and Environment.

To carry out the Company's obligations, Social and Environmental Responsibility activities must be budgeted and calculated as the Company's expenses which are carried out with due regard to propriety and fairness. These activities are included in the Company's annual report. In the event that the Company does not carry out its Social and Environmental Responsibility, the Company concerned is subject to sanctions in accordance with the provisions of the legislation. Reports on Social and Environmental Responsibility activities must be reported by the Board of Directors as part of the annual report to the General Meeting of Shareholders (GMS) after being reviewed by the Board of Commissioners within a period of no later than 6 (six) months after the Company's financial year ends.

2.3.2 ISO 26000 as a Global Standard in the Implementation of CSR

In September 2004, ISO (International Organization for Standardization) as the parent organization of international standardization, took the initiative to invite various parties to form a team (working group) that was responsible for the birth of guidelines and standardization for social responsibility named ISO 26000: Guidance Standard on Social Responsibility. ISO 26000 provides a voluntary standard of guidance regarding the social responsibility of an institution that covers all sectors of public and private bodies. The setting for ISO's activities in social responsibility lies in the common understanding that CSR is very important for the sustainability of a company.

ISO 26000 is a voluntary guidance standard- that is, it does not contain requirements such as those used when a standard is offered for "certification". There is a certain learning curve associated with using ISO 26000, because there is no specific external reward – certification – explicitly tied to ISO 26000. Therefore, a general guideline is needed in the implementation of CSR. With the preparation of ISO 26000 as a guideline or as the main reference in making generally accepted CSR guidelines, as well as responding to the challenges of the needs of the global community, including Indonesia.

ISO 26000 translates social responsibility as the responsibility of an organization for the impact of its decisions and activities on society and the environment, through transparent and ethical behavior, which:

- Consistent with sustainable development and community welfare
- Taking into account the interests of stakeholders
- In accordance with applicable law and consistent with international norms
- Integrated in all organizational activities, in this sense includes both activities, products and services.

ISO 26000 Guidance Standard on Social Responsibility consistently develops Social Responsibility into 7 (seven) main issues, namely:

- Community development
- Consumers
- Practice Healthy Institutional Activities
- Environment
- Employment
- Human rights
- Organizational Governance

In particular, the WASH aspect is one of the topics in the scope of social responsibility issues in ISO 26000. For example on labor practices issue, conditions of work include welfare matters such as safe drinking water, sanitation, and access to medical services. The employer determines many of the conditions of work. Conditions of work greatly affect the quality of life of workers and their families and also economic and social development. Fair and appropriate consideration should be given to the quality of conditions of work. Another example is environmental issue on use and access to water where access to safe, reliable supplies of drinking water and sanitation services is a fundamental human need and a basic human right. Issues on Community involvement and development issue on health topic also cover WASH topic where an organization should consider supporting

long lasting and universal access to clean water and appropriate sanitation as a means of preventing illness.

Based on the concept of ISO 26000, the implementation of social responsibility should be integrated in all organizational activities. Thus, if a company only pays attention to certain issues, for example a company is very concerned about environmental issues, but the company still advertises recruitment by specifically mentioning the needs of employees according to a certain gender, then according to the ISO 26000 concept the company has not actually carried out its responsibilities. full social responsibility.

III. DIFFERENT COMPONENTS OF WASH – WATER SUPPLY, SANITATION, HYGIENE (WHAT THIS MEANS FOR BUSINESSES)

3.1 Safe Water at the Workplace

Water at the workplace refers to the ability to access safe water for drinking, personal and workplace hygiene, within a reasonable distance from the working task or the worksite. Safe water at the workplace should be seen holistically, as an essential element for maintaining OSH through water drainage, vector control, and management of water-related risks. Access to safe water also encompasses interventions that reduce human exposure to contaminated water by providing mechanisms to promote hygiene and sanitation. It involves both behaviors and facilities, which work together to form a safe and healthy workplace.

3.1.1 Safe Drinking Water

Water is essential for the survival of all human beings. Without safe water, people simply cannot stay alive, or thrive in a healthy environment. The safety of drinking water is a growing concern in many countries, as water sources are increasingly under threat from microbial or chemical contamination, which impacts individual health, as well as the economic, environmental and social development of communities and nations. In many workplace and living environments, diseases can be spread by poor personal, food and environmental hygiene due to insufficient water and by the consumption of contaminated water.

Safe drinking water, also known as “potable water” or “improved drinking water”, is water that is of sufficient quality to be used for drinking (as well as for cooking and personal and domestic hygiene) without causing risk to health. Unfortunately, a lot of water that is intended for drinking is not always safe. The three main threats to drinking water are microbial, chemical, and radiological.

<u>Microbial threats</u>

Water may be contaminated with bacteria, viruses or parasites, which are linked to the transmission of numerous diseases. The greatest risk to health from germs in water is due to contamination with human and animal excreta. If there is an infection in a person, the microbe can multiply and spread in human excreta and infect others. Certain microbes can also multiply in food, drinks and warm water systems, increasing the risk of contamination and infections. Examples of waterborne diseases/disease agents (not limited to) are:

- Bacterial: Dysentery, Cholera, Typhoid Fever, Escherichia coli
- Viral: Hepatitis E, Hepatitis A, Polio

- Parasitic: Cryptosporidium, Giardia, Toxoplasma gondii

(Source: World Health Organization (2015). Waterborne diseases, Fact sheet N391)

Chemical threats

In addition to germs, water can also contain certain chemicals. Some chemicals are harmless, but others can cause negative health effects. Most chemicals in drinking water are a concern after long exposure – usually of years rather than months. That is because the health effects may be cumulative, and slowly get worse over time. Chemicals can get into water from different sources. They include:

- Naturally occurring sources (from rocks and soil)
- Industrial or human sources (by-products of manufacturing or chemicals from unsecured mine tailings)
- Agricultural activities (pesticides and fertilizers)
- Materials in contact with drinking- water (disinfectants and chemicals in water piping)

Chemical contaminants in water (examples):

- Naturally occurring: Arsenic, Fluoride, Iron
- Industrial sources and human dwellings: Beryllium, Cyanide, Mercury
- Agricultural activities: Ammonia, Endosulfan, Nitrate
- Water treatment or materials in contact with drinking-water: Asbestos, Chlorine, Lead

Radiological threats

Drinking water may also contain radioactive substances that may present a risk to human health. Radiological risks are typically less hazardous compared to the risks from microbes and chemicals. Except in extreme circumstances, the radiation dose in drinking water is much lower than that received from other sources of radiation. Testing of nuclear weapons, routine discharges from industrial and medical facilities and accidents have added human-made radioactivity to drinking waters.

3.1.1.1 Sources of Safe Drinking Water

While there are many sources for water, only improved drinking water sources should be trusted for drinking or cooking. An “improved” drinking water source is one that, by nature of its construction or through active intervention, is protected from outside contamination, in particular from contamination with faecal matter.

Table 3.1 Improved and unimproved sources of drinking water

	Water source	Definition
IMPROVED DRINKING WATER	**Piped water into dwelling**	A water service pipe connected with in-house plumbing to one or more taps (e.g. kitchen and bathroom). Also called a household connection.
	Piped water to a yard or plot	A piped water connection to a tap placed in the yard or plot outside the house. Also called a yard connection.
	Public tap or standpipe	A public water point from which people can collect water. It may have one or more taps made of brickwork or concrete. Also known as a public fountain or public tap.
	Tubewell or borehole	A deep hole that has been bored or drilled, in order to reach groundwater. Constructed with casing, or pipes, to prevent them from caving in and protects the water source from infiltration by run-off water. Water is pumped up, which may be powered by human, animal, wind, electric, diesel or solar means.
	Protected dug well	A well that is protected from runoff water by a well lining or casing that is raised above ground level and a platform that diverts spilled water away from the well. It is also covered, so that animals and waste cannot fall in.
	Protected spring	A natural spring that is protected from runoff, bird droppings and animals by a "spring box", which is made of brick or concrete and is built around the spring so that water flows out of the box and into a pipe or catchment, without being exposed to outside pollution.
	Rain water	Rain that is collected from surfaces (by roof or ground catchment) and stored until used.
UNIMPROVED SANITATION	**Unprotected spring**	A spring that is subject to runoff, bird droppings, or the entry of animals. Unprotected springs typically do not have a "spring box".
	Unprotected dug well	A dug well for which one of the following is true: 1) not protected from runoff water; or 2) not protected from bird droppings and animals. If at least one is true, the well is considered to be unprotected.
	Small tank or drum of water delivered	Water sold by a provider who transports water into a community using donkey carts, motorized vehicles and other means.
	Tanker truck	Water that is trucked into a community and sold from a water truck.
	Surface water	When water is located above ground. Includes rivers, dams, lakes, ponds, streams, canals, and irrigation channels.

Source: WHO/UNICEF Joint Monitoring Program (JMP) for Water Supply and Sanitation. Improved and unimproved water sources and sanitation facilities. 2015.

Bottled water is also a source of drinking water. However, bottled water is considered to be improved only when the household or workplace uses drinking water from an improved source for cooking and personal hygiene. Where this information is not available, bottled water is classified on a case-by-case basis.

3.1.1.2 Worker Requirements for Drinking Water

Water is a basic need of the human body and is critical to human life. The human body

requires a minimum amount of water in order to be able to be able to function properly. Without a certain amount, mild and then severe dehydration occurs.

- **Mild dehydration** results in negative health effects, like loss of alertness and concentration, headaches and confusion. Mild dehydration can be reversed by increased fluid intake and may be enhanced through the use of salt replacement solutions.
- **Severe dehydration** can lead to kidney and urinary disorders, and can be fatal. Severe dehydration requires medical attention.

The definition of the 'absolute minimum' quantity of drinking water to maintain hydration is difficult to establish. Minimum requirements for worker hydration will be different for each worker, and will depend on many different factors, including:

- Worker characteristics, such as: age, body-weight index, physical condition, degree of acclimatization, metabolism, presence of health condition, consumption of drugs or alcohol.
- Types of work tasks conducted, i.e., light, medium, or heavy work.
- Temperature and humidity.
- Clothing and personal protective equipment (PPE) worn.

Given that workers lose water through perspiration, any work activities that increases workers' sweating rate, as well as warmer temperatures, are key factors to consider when determining worker hydration needs. The tables below present indicative values for consideration.

Table 3.2 Hydration needs based on activity and temperature.

	Sedentary, Temperate Environment	Physically Active and/ or Increased Temperature
Female adult	2.2 litres/day	4.5 litres/day
Male adult	2.9 litres/day	4.5 litres/day

Source: Howard G, Bartram J. (2003) Domestic Water Quantity, Service, Level and Health. World Health Organization.

Dehydration is a key cause of heat illnesses, including heat rash, heat stress, heat exhaustion and heat stroke. Working in environments with high air temperatures or high humidity, radiant heat sources, or strenuous physical activities have a high potential for inducing heat stress in workers. Examples may include:

- Indoor or closed-space operations like iron and steel foundries, brick-firing plants, glass and rubber production facilities, electrical utilities (boiler rooms), kitchens, chemical plants, underground mines, and smelters.
- Outdoor operations conducted in hot weather, such as agriculture, construction, mining, refining, and hazardous waste site activities, especially those that require

workers to wear semipermeable or impermeable PPE.

3.1.1.3 Water Access for Special Groups of Workers

- **Young workers** are vulnerable to dehydration due to their developing bodies. They are less able to regulate their body temperatures in hot working conditions.Young workers generate more heat per pound of body weight than adults. They also may lack the knowledge for maintaining hydration while at work.
- **Pregnant women** require additional fluid replacement to ensure that foetal needs are met, as well as providing for expanding extra-cellular space and amniotic fluid. Pregnancy naturally elevates the body's temperature, making women more vulnerable to heat exhaustion.
- **Lactating women** have additional water requirements, of 750ml to 1 litre per day for the first six months of lactation.
- **Disabled workers** may face barriers to accessing drinking water stations. They may also have different requirements for water intake.
- **Older workers** may not require additional volumes of water, but may be at greater risk from dehydration due to decreasing thirst sensations.
- **Ill or immunocompromised workers** may be more likely to get sick from water that is contaminated when compared to healthy workers. Based on their illness, they may already suffer from dehydration and require a certain amount of water, or electrolyte intake needs.

3.1.1.4 Workplace Requirements for Drinking Water

Access to safe drinking water at the workplace is a fundamental human right. To keep workers safe, healthy and productive, employers must guarantee access to safe drinking water, related materials (such as cups), and as well as maintenance of water facilities. Recommendations for drinking water provisions at the workplace are presented below.

<u>Drinking water should come from an approved source</u>

This means that it should be approved, supplied and monitored by a water authority and should be guaranteed to be potable. Running water should be provided if it is available and practical. Examples include piped water fountains, and water installations connected to a piped source. If running water is not available, potable water should be provided in containers. Examples include water coolers, jerry cans, or other closed and tapped containers. Containers should be:

- Tightly closed to protect water from being contaminated from outside sources;
- Have a tap or a cock for the dispensing water;
- Clearly marked with what they contain; and
- Regularly cleaned and disinfected to be sure that they do not become contaminated.

<u>Drinking water should be palatable</u>

Water should be pleasant in taste and be odor-free to encourage drinking. The ideal situation is that water does not have any taste that makes users question its quality. It is important to remember that taste alone does not always indicate a direct health problem (e.g. water that tastes slightly of chlorine does not pose a health risk), but if the safe water supply does not taste good, users may decide to drink from unsafe sources instead (e.g., untreated surface water from ponds or lakes) and put their health at risk.

Water should be at an appropriate temperature, based on the workplace and environmental conditions. In room temperature environments, water that is cool is more palatable than warm water, encouraging workers to drink.

Drinking water should always be accessible

Accessing drinking water should always be easy and convenient for all workers at the workplace. The needs of disabled workers should always be considered. Workplace drinking stations should be designed in a way that makes access easy for everyone. Water- drinking facilities should not be too high, and there should not be unnecessary obstacles to reach them.

In sectors such as construction, agriculture or forestry, or where workers are required to move and change worksites often, drinking water should be available either at every worksite, or within reasonable access – which means it should be located at a convenient distance for all workers. Mobile water dispensing units that are closed and have a spout are an easy solution. Another option could be to provide workers with backpacks that contain potable water, with personal drinking attachments.

Working in mines can be hot and hard work! Drinking water should be accessible above and below the surface of the mine as needed.

Appropriate drinking vessels should be provided

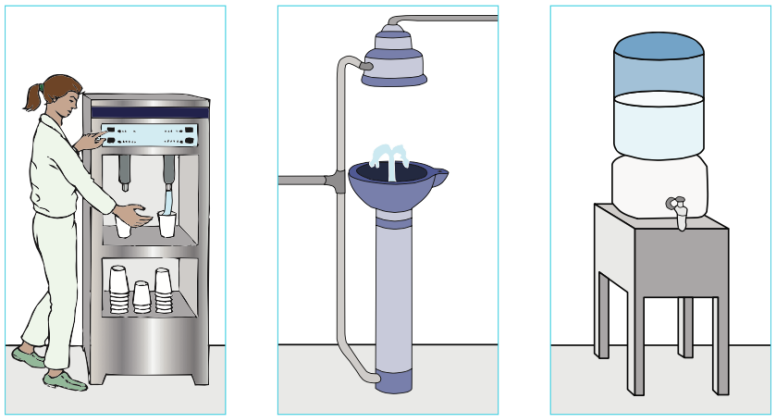


Figure 1. 1. 1. Appropriate ways of providing drinking water at the workplace. ILO/WHO HealthWISE Action Manual, 2014.

Other workers can easily contaminate drinking water especially if they are sick or have been exposed to hazardous substances at the workplace. For this reason, drinking

vessels should not be shared.

Individual drinking vessels, such as cups or bottles should be provided for each worker, and be of personal use. Drinking vessels should not be shared between workers. If single use vessels are not provided, potable water should be available in close proximity to the drinking station to regularly clean drinking vessels.

Hands may be contaminated and pose a health risk, and thus should not be used as a method for drinking water.

Drinking water provisions should be appropriate for workplace conditions

Workplaces differ dramatically based on sector and work task. The best way to understand the most appropriate methods of drinking water provision are to conduct a workplace risk assessment. Elements to consider include:

- Temperature and humidity of working environment
- Type of work activity (light, moderate, or heavy)
- Location of work tasks and proximity to drinking stations
- Individual needs of workers (i.e., are workers acclimated to the working environment)
- Potential for water contamination. For example, pesticides and fertilizers can contaminate water on agricultural lands, and there should be extra care to ensure that water is potable for workers in these settings

3.1.2 Safe Water for Personal and Workplace Hygiene

In addition to safe water for hydration needs, there are other workplace needs where access to safe water is crucial for worker health, wellbeing, and productivity. Access to safe water for all workers is necessary for the management of:

- Personal hygiene (for washing and bathing)
- Workplace hygiene (cleaning and laundering)
- Food hygiene (preparing food/cooking)

3.1.2.1 Water for Personal Hygiene

Access to safe water at the workplace is required for maintaining personal hygiene through the proper use of sanitary and washing facilities. Poor hygiene at the workplace can be related to a lack of sufficient quantity of safe water supply. For this reason, workplaces must treat access to safe water not solely as a question of hydration needs, but also as a matter of personal hygiene.

Sanitary facilities

The type of sanitary facilities provided, including whether they are piped (flush toilets) or unpiped systems (latrines or composting toilets) has a big impact on water requirements. Flush toilets often require large volumes of water, while pour flush toilets or latrines may

require much less, and dry latrines none at all. Whatever the case may be, employers are responsible for ensuring that the necessary means to maintain the sanitary systems in place is provided, including the provision of water. This is particularly important for the agricultural sector, where a lack of sanitary facilities and their maintenance can jeopardize the health of agricultural workers and their crops.

Additional quantities of water may also be necessary for personal cleansing with water or a hand-held bidet sprayer (i.e., anal washing), where toilet paper is not used. This will be function of the cultural context of the workers, which must be taken into consideration when designating the amount of water needed for sanitary facilities.

Handwashing and bathing

Handwashing with soap and water at critical times is essential for maintaining good personal hygiene. The same goes for the washing (showering and bathing) when necessary, particularly after handling or being exposed to hazardous substances (such as germs from animal handling or slaughtering, or spraying pesticides) or great amounts of dusts (including coal or rock dusts). Water for handwashing and for bathing must be potable, so that it does not pose a health risk for workers. Access to safe water should also be guaranteed in private washing facilities or showers, as necessary, to maintain personal hygiene.

Menstrual hygiene management (MHM)

Workplace provision of potable water for washing should also take into consideration needs for MHM. Menstruating girls and women may have special needs for safe water access. Access to safe water should be guaranteed within toilet cabins for handwashing, as well as for washing of soiled menstrual materials in privacy.

3.1.2.2 Water for Workplace Hygiene

Access to water at the workplace is also necessary for managing cleanliness through routine and specialized cleaning and laundering. Maintaining hygienic conditions at the workplace promotes worker health, wellbeing and morale. It may include:

- Standard cleaning of workplace surfaces (including floors, windows, ceilings and sanitary and washing facilities)
- Disinfection of surfaces when necessary (in settings with exposures to hazardous substances, such as biological liquids or medical waste)
- Laundering of workplace materials, like towels and bedsheets
- Cleaning or laundering of workplace clothing or PPE

The amount of water necessary for cleaning and laundering will be dependent on the work sector and work tasks.

3.1.2.3 Water for Food Hygiene

Water represents an essential medium for cleaning, preparing and cooking food. The water used for these needs will contact the food for ingestion, meaning that it must be safe from contaminants and not pose a health risk for workers. For this reason, all workers should have access to potable water for food and cooking related needs, including water for washing foods, water for preparing and cooking foods, and water for cleaning utensils and cooking materials.

The amount of water workers require for cooking depends on the diet, the role of water in food preparation, and worker needs for cooking at the workplace, based on the work sector characteristics. At workplaces that are isolated, and where workers also have accommodations, such as on fixed offshore installations, or in the maritime industries, it is essential that potable water be provided in adequate amounts.

3.2 Sanitation

Sanitation at the workplace refers to the provision of facilities and services for the safe disposal of human excreta, menstrual hygiene products, and workplace waste. Workplace sanitation is a comprehensive term that means more than just toilets. It also refers to the maintenance of hygienic conditions, through the proper use and cleaning of toilets, through services such as wastewater and faecal sludge management, solid waste collection, as well as through the promotion of individual employee sanitation behavior, including the proper use of toilets and prevention of open defecation. Sanitation also encompasses interventions that reduce human exposure to diseases by providing a clean environment in which to work. It involves both behaviors and facilities, which work together to form a hygienic workplace.

3.2.1 Sanitary Facilities

Sanitary facilities, such as accessible toilets, are essential needs for all human beings. Sanitation has been recognized as a universal human right. However, many people around the world do not have access to toilets, and therefore go in the open – **a practice known as open defecation.** Open defecation perpetuates a cycle of disease and poverty. The countries where open defecation is most prevalent have the highest number of deaths of children under 5, and the highest levels of malnutrition and poverty. Open defecation exposes people, particularly women and children, to potential harassment and violence. Open defecation poses additional challenges for women and girls who are managing their menstruation without safe facilities.

Human excreta contain germs that can cause illnesses and diseases. When people become infected with these germs, their excreta will contain large amounts of the germs that have the potential to cause disease in others who have contact with it. Examples of sanitation related diseases (not limited to) are:

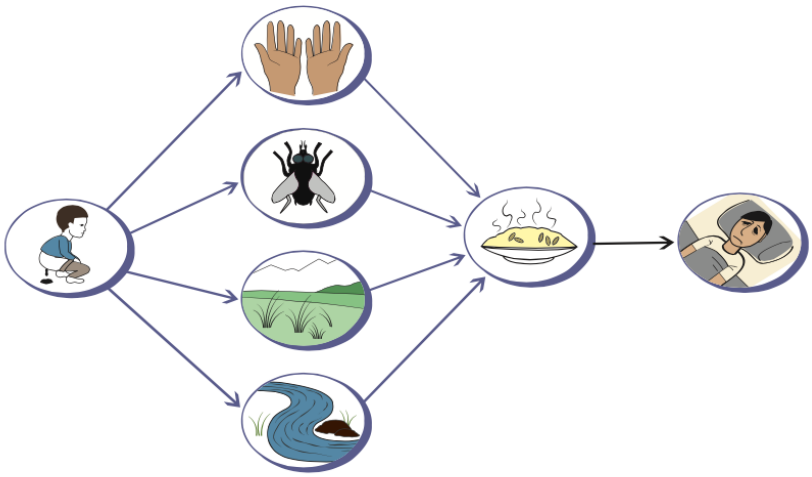
> Diarrhoea, Dysentery, Cholera, Hepatitis E, Hepatitis A, Typhoid Fever, Polio
> (Source: World Health Organization (2015). Sanitation, Fact sheet N392)

Germs in excreta can infect others in different ways. For example:

- **Fluids:** Excreta may be washed away by rain and run into wells and streams, thereby contaminating water used for drinking.
- **Fingers:** Fingers or hands that haven't been washed after going to the toilet can contain germs. These unclean hands can transmit germs onto foods, which are then eaten; or to other people when shaking hands.
- **Flies:** Flies and other insects may feed on the excreta and carry small amounts of it and its germs away on their bodies. When flies or insects touch water or food, the germs may be passed on, potentially infecting the person drinking or eating.
- **Floors/fields:** Germs can spread onto floors and seep into fields and crops and other sources of food if excreta are not disposed of properly.

The diseases caused by contact with human excreta can be serious and life threatening. For example, diarrhoea remains a major killer of children and adults around the world, but is largely preventable.

Figure 2.1.1. F-DIAGRAM.



This diagram is known as the F-diagram because all germ paths of faecal and oral contamination start with the letter F. Adapted from Wagner, E. G., and Lanoix, L. N. (1958). Excreta disposal for rural and small communities. WHO, Geneva, Switzerland p. 12."

3.2.1.1 Type of Toilets

In basic terms, there are two types of toilets: "improved" or "unimproved" toilets. An improved toilet is one that hygienically separates human excreta from human contact. An unimproved toilet is simply one that does not. To protect human health, improved toilets are needed (Table 2.1.1).

Table 2.1.1. Types of sanitary facilities.

	Type of facility	Definition
IMPROVED SANITATION	**Flush toilet**	Uses a cistern or holding tank for flushing water, and a water seal (a pipe below the seat or squatting pan) that prevents the passage of flies and odours. Sewage is disposed of by piped sewage system or septic tank.
	Pour-flush toilet	Uses a water seal, but unlike a flush toilet, a pour flush toilet uses water poured by hand for flushing (no cistern is used). Sewage is disposed of by piped sewage system or septic tank.
	Pour–flush latrine	A type of pit latrine where small volumes of water are used to flush excreta into a pit. They are most appropriate where people use water to clean themselves after defecating and where people have access to reliable water supplies close to the home. The pit is usually connected to an area where liquids infiltrate the soil, leaving solid waste to decompose.
	Ventilated improved pit latrine (VIP)	A dry pit latrine ventilated by a pipe that extends above the latrine roof. The open end of the pipe is covered with mesh or fly-proof netting and the inside of the superstructure is kept dark. It is designed to be a dry system, and is most appropriate where people do not use water for cleaning themselves after defecating, but use solid materials such as paper or leaves. Excreta infiltrates the soil, leaving solid waste to decompose.
	Pit latrine with slab	A dry pit latrine where the pit is fully covered by a slab or platform that is fitted either with a squatting hole or seat. The platform should be solid and can be made of a material (concrete, cement, etc.) that covers the pit without exposing the pit content, other than through the squatting hole or seat. Excreta infiltrates the soil, leaving solid waste to decompose.
	Composting toilet	A dry toilet into which carbon-rich material (grass, sawdust, ash, etc.) are added to the excreta and special conditions maintained to produce inoffensive compost.
UNIMPROVED SANITATION	**Pit latrine without a slab**	Uses a hole in the ground for excreta collection and does not have a squatting slab, platform or seat. An open pit is a rudimentary hole.
	Bucket or other open container	The use of a bucket or other container for the retention of human excreta which are periodically removed for treatment, disposal, or used as fertilizer.
	Hanging toilet or hanging latrine	A toilet built over the sea, a river, or other body of water, into which excreta drops into directly.
	No facilities (open defecation)	Includes defecation into the bush/field/surface water; excreta deposited on the ground and covered with a layer of earth; or excreta wrapped and thrown into garbage.

Source: WHO/UNICEF Joint Monitoring Program (JMP) for Water Supply and Sanitation. Improved and unimproved water sources and sanitation facilities. 2015.

3.2.1.2 Toilets at Work

The need for toilets in the workplace is obvious, and a human right, but it still tends to be ignored. No matter in which country, or in which sector people work, employers have a responsibility to provide better sanitation facilities that enable workers to safely defecate – including for women to manage their menstrual hygiene needs – without compromising their health, or the health of others.

While governments and competent authorities are responsible for setting laws about toilets and their management at work, employers are responsible for providing and

maintaining the toilets. In certain situations, employers are also responsible for the provision of living accommodation for workers, in which case, also includes proper toilets. In turn, workers are responsible for the proper use of toilets to protect their own health, the health of their fellow workers and nearby communities.

3.2.1.3 Toilet for Different Types of Workers

While all workers deserve access to improved sanitary facilities, there are some groups of workers that demand special considerations.

- **Women and adolescent girls.** Menstruation is a taboo subject in many communities and cultures, and this clearly extends to the workplace. Not having a safe and private space to change soiled products can cause health risks such as infections, as well as the mental health concerns of anxiety, stress and reduction of morale. Not being able to manage menstruation-related sanitation at the workplace could lead to missed hours or days at work and decrease productivity.
- **Pregnant women.** Pregnant women may need to use the toilet more frequently and may therefore need more time for toilet breaks during the workday. Without frequent toilet breaks, workers, and especially pregnant woman, can develop health problems.
- **People with disabilities.** Workers with disabilities may have different needs for accessing toilets. Worksite design is a crucial stage to consider adequate and safe toilet access for disabled workers. Sanitary facilities should be designed, built and located in a way that makes them easily accessible and easy to use by people with disabilities. Barriers that may exist include steps at the entrance to sanitary facilities, absence of handrails, lack of adequate light, narrow doors and minimal space to turn wheelchairs or use crutches, and sanitary facilities that are located far away from the workplace.
- **Ill or immunocompromised persons.** Workers with HIV/AIDS and other immunocompromised persons may be more likely to get sick from germs at the workplace related to poor sanitation. Human excreta may also spread germs of ill workers to healthy workers. Special attention should be paid to sanitary facilities for ill people, and the workplace should be made safe so that all people working together are kept safe and healthy.

3.2.1.4 Toilets for Different Work Sectors

Workers in all sectors deserve access to improved toilets. However, as each work sector differs, so may the need for specific details about access to toilets. Various ILO instruments give guidance for toilets according to sector.

3.2.2 Wastewater And Faecal Sludge Management

The aim of the improved sanitary facilities described is to separate human excreta from human contact. This human excreta must go somewhere, and properly managing it by eliminating contamination with the environment is essential for human health. Safe management of excreta is essential for both workers as well as local communities. Excreta

management can be accomplished in many ways, some requiring water, others requiring little or none. Regardless of method, safe management of excreta is one of the principal ways of breaking the faecal–oral disease transmission cycle. Sanitation is therefore a critical barrier to disease transmission.

Terminology:

- **Faecal sludge** is the term used to describe human excreta collected in on-site sanitation systems, such as latrines, non-sewered public toilets, and septic tanks. Septage, the faecal sludge collected from septic tanks, is included in this term.
- **Wastewater** is an encompassing term, and includes:
  - Blackwater, or sewage: Human urine and faeces
  - Greywater, or sullage: Used water sources from cooking, washing and bathing.

  Wastewater is often mixed with water for flushing and moves from toilets through piped, sewerage systems.

Just like for toilets, there are “improved/safe” and “unimproved” methods for sanitation management. **Improved methods** are defined as those that hygienically separate human excreta from human contact, and are crucial for reducing disease in the workplace and in surrounding communities. **Unimproved sanitation** is not a safe excreta management method and should be avoided to protect human and environmental health. Unimproved sanitation**,** in regards to excreta management, is when:

- There is a flush/pour flush or release of excreta to elsewhere other than what is presented in Table 2.2.1.
- Excreta is deposited in or nearby the household or workplace environment (not into a pit, septic tank, or sewer), or when excreta is flushed to the street, yard/plot, open sewer, a ditch, a drainage way or other location.

Table 2.2.1. Improved methods for sanitation management

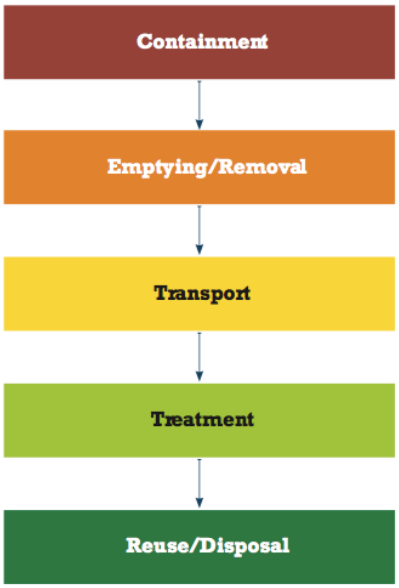
Type of method	Description
Off-site: 'Conventional' sewerage	System of sewer pipes (i.e., sewerage) that is designed to collect wastewater and remove it from the household or workplace. Sewerage systems require water for flushing waste away. Sewage networks are expensive and demand extensive planning and construction, and good operational management.
Off-site: Simplified sewerage	Characterized by smaller diameter pipes buried at a shallower depth than those used in conventional sewerage networks.
Mixed: Settled sewerage	Designed for moving the greywater component of wastewater after the solids have settled in a septic tank (see below).
On site: Septic tank	On-site sanitation system that provides the convenience of a sewerage system, and collects the sewage and waste water from toilets in a holding area, usually below ground. Requires periodic emptying and must be accessible to a vacuum tanker.
On-site, unpiped: ▸ Flush/pour flush to pit latrine ▸ Dry pit latrines (VIP, or with slabs) ▸ Composting toilets	In on-site systems that are unpiped, excreta is stored in a hole in the ground or in a protected and covered leaching pit; or in composting material (for composting toilets), where it can decompose. Full latrines are often covered and safely abandoned, with a new pit being constructed elsewhere. To be considered improved, the on-site system must hygienically separate human excreta from human contact, and must not allow for contamination of the local environment. In urban or densely populated areas, or areas with high water tables, on-site systems may not be adequate.

Source: WHO/UNICEF Joint Monitoring Program (JMP) for Water Supply and Sanitation. Improved and unimproved water sources and sanitation facilities. 2015.

3.2.2.1 Wastewater/Faecal Sludge Management

The term "management" encompasses a series of steps that are necessary in ensuring that excreta do not enter and contaminate the area outside of the sanitary facility. These methods are described in the sanitation service chain (Figure 2.2.1). Wastewater and faecal sludge management may involve the assistance of local sewage and public works authorities, as well as private services. These methods will differ based on whether an on- site (non-sewered); or an off-site (sewered) system is present.

Figure 2.2.1. Sanitation service chain.



Source: Wastewater Management, A UN-Water Analytical Brief, 2015.

<u>On-site Systems (i.e., Non-sewered Systems)</u>

In these systems, faecal sludge accumulates on-site in a pit or septic tank, which requires periodic emptying or re-siting. In the case of emptying, faecal sludge is taken away for treatment and/or disposal.

- **Latrines:** Latrines store and/or treat faecal sludge at the point of generation. Faecal sludge requires treatment before disposal, so that local water sources are not contaminated and communities are not exposed to health risks

from untreated excreta. In densely populated areas, off-site treatment may be necessary, which involves emptying/removal and transport by local public works departments or service providers.

- **Septic tanks:** These systems require periodic emptying/removal by vacuum tankers, followed by off-site treatment towards reuse or disposal.

Off-site Systems (i.e., Sewered Systems)

In off-site systems, sewer networks remove and transport wastewater from toilets through a pipe system. Pumping stations are sometimes needed to ensure that the waste reaches the treatment or disposal point. Sewerage systems connected to flush toilets are designed to collect wastewater and transport it away from homes to a treatment and/or disposal point. All sewerage systems must be connected to a treatment plant, as human excreta represents a public health risk before it is treated. Therefore, sewerage is a high-cost sanitation option, which requires funds for operation and maintenance by trained services who can ensure that wastewater is taken away from the workplace, treated and reused/ disposed of in the correct way.

3.2.2.2 Wastewater Considerations for the Workplace

Wastewater management systems at the workplace must be locally appropriate. Decisions on the approach within that system should be context- specific, and should be based on the local environment (temperature, rainfall), culture, and resources (human, financial, material and spatial).

In order to accomplish improved sanitation, governments must approve of and monitor sanitation services with local public works departments and private actors. Employers should ensure they have improved systems for wastewater and faecal sludge management, and coordinate with local public works departments and private services to ensure that technical support is provided. Workers should be aware of improved sanitation efforts and actively monitor their workplace for sanitary risks.

3.3 Hygiene

Hygiene at the workplace describes the practice of keeping oneself, and the surrounding environment, clean and free of infection risk. It includes personal and workplace practices that protect health and stop the spread of illness and disease, such as handwashing, bathing, laundering, food hygiene, and safe menstrual hygiene management. It also refers to the provision of facilities and services that can be used by everyone to help maintain health and prevent the spread of illness and disease, such as handwashing facilities with water and soap, showers, laundry facilities, food service facilities, and options for menstrual hygiene management. Hygiene encompasses interventions that promote hygienic behaviors and management at the workplace, taking into account both behaviors and facilities, which work together to form a hygienic workplace.

3.3.1 Hand Hygiene

Access to improved water and sanitation facilities does not, on its own, necessarily lead to improved health and hygiene. Evidence shows that hygienic behavior is crucial to protecting against illness and disease. Of these behaviours, handwashing with soap at key moments (including after defecation, before food preparation and eating) is of central importance. Germs are spread from person to person through contaminated hands in the absence of good hygiene. As presented in the Sanitation module, human excreta contain germs that can cause disease. Hands that have been in contact with excreta, nasal excretions and other bodily fluids, can pass large numbers of germs. Hands can also carry other workplace germs from sources such as animal or bird excreta, domestic or wild animals, and contaminated foods. In addition to germs, hands can be a transport route for dangerous materials, like pesticides or other toxic chemicals.

Handwashing is especially important at workplaces, where large numbers of people may congregate in close quarters. It is key in areas where:

- Ill or vulnerable people are concentrated (healthcare settings, nursing homes);
- Where food is prepared and eaten (workplace canteens); and
- Workplace accommodation, especially where there are young children.

Examples of hygiene related diseases (not limited to) are:

Pneumonia, Trachoma, Scabies, Skin and eye infections, Diarrhoea-related diseases (such as Cholera and Dysentery)
(Source: UNICEF (2015). Hygiene Fact Sheet)

3.3.1.1 Facilities for Proper Handwashing

Handwashing facilities are necessary at the workplace in sufficient quantities and accessible for all. This includes four necessary components: access to washbasins with soap, running potable water and single use towels (paper or otherwise) or other means of hand drying.

Washbasins (or Other Handwashing Facilities)

These are the structures that allow workers to wash their hands with running water. They can come in all shapes and sizes, and can be single use, or allow for many workers to wash their hands at the same time (i.e., group handwashing facilities), depending on the workplace. They should be attached to a piped water system that provides potable running water through a tap or faucet. Drainage, or a system for collecting wastewater is also necessary, as it may contain germs or hazardous materials washed off of the hands.

Running Water

Water running from a piped water source is less likely to be contaminated. Still water, such as water in a tub or in a bucket, may already contains germs from others that washed their hands in it. The ideal situation is to have piped running water available for handwashing facilities. However, not having access to piped running water does not mean that workers cannot properly wash their hands. Other methods could include hanging a container from

above and filling it with clean water. When a tap is attached, it can release the water in small amounts to run over hands during washing.

Soap

Proper handwashing requires soap, or soap alternatives. Washing hands with water alone is significantly less effective in terms of removing germs. Soap is important because:

- Soap breaks down the grease and dirt that carry germs by helping the rubbing and friction that dislodge them.
- Using soap adds to the time spent washing which increases the chance that germs will be removed or destroyed.
- Soap leaves hands smelling pleasant. The clean smell and feeling that soap creates is an incentive for its use.

Some work tasks can make the hands extremely dirty, or can leave them covered in materials that are difficult to remove, like paint. Remember that dangerous materials, like paint solvent and other chemicals, should not be used to wash hands as they can be dangerous for human health.

Hand Towels or Dryers

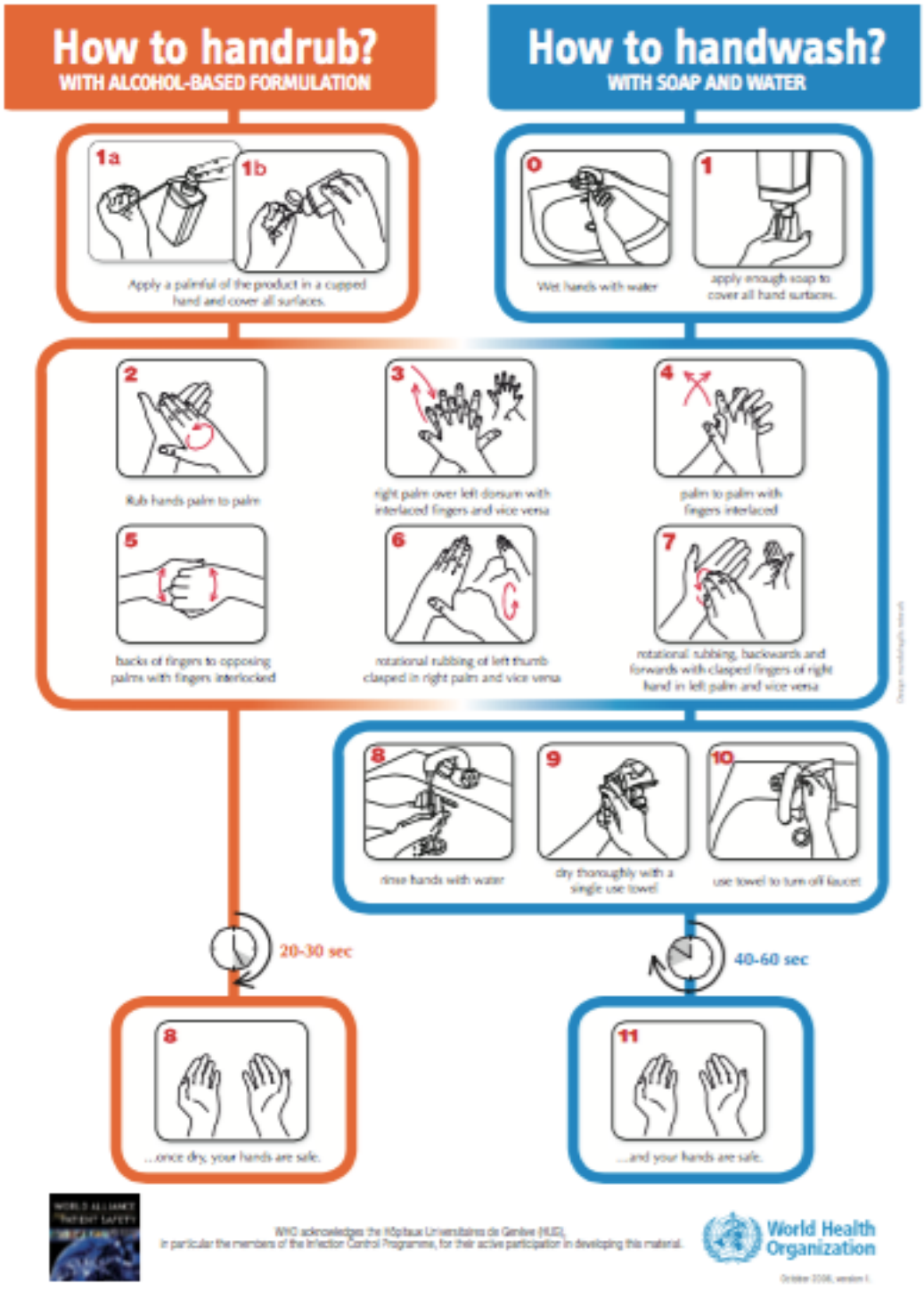
After washing hands, hands should be dried. Wet hands are slippery and can cause unintentional accidents at the workplace. To promote hand drying, towels or other suitable means of drying hands should be located near washbasins. This may include single use towels made of paper or other material, or air-dryers. The critical point is that whatever means are used to dry hands, they should be sanitary. Sometimes, not all germs are removed during handwashing, potentially transferring them to the towel used for drying. This means that:

- Each towel should be used by only one worker and should be used only once.
- After use, it should be disposed of immediately, or left for laundering, in the appropriate place.

3.3.1.2 Proper Way to Wash Hands

Handwashing should take at least 20 seconds. Refer to the following guide for proper handwashing, step-by-step. This guide can be posted as a reminder at the workplace.

Figure 3.1.2. The standard WHO guide to proper handwashing.



During work, there are critical times when handwashing is particularly important.

Before

- **Before** eating or drinking

- **Before** handling or serving foods or drink
- **Before** starting a new work activity or task where clean hands are important (i.e., handling patients in a healthcare setting).
- **Before** going home to your family.

After

- **After** using the toilet or urinal.
- **After** exposure to human excreta from cleaning or accidents, or from changing diapers.
- **After** exposure to human biological liquids, such as nasal discharge while sneezing.
- **After** exposure to dangerous materials, like animal waste, pesticides, or toxic solvents.

3.3.1.3 Location of Washbasin/Hand Washing Facility

Workplace sanitation and hygiene come hand-in-hand. As such, washbasins should always be located in close proximity to any exposure that presents a health risk; or in places where clean hands are necessary to promote workplace health. They must also be fully accessible for people with disabilities. This includes:

- Toilets and urinals: Any workplace toilet or urinal should have, in close proximity, a washbasin with soap and water. Some toilet rooms include a washbasin next to the toilet. Washbasins can also be located immediately outside of the toilet. The proximity of the washbasin to the toilet should remind and encourage workers to wash hands after using a toilet or urinal and before returning to work. Handwashing facilities inside gender separated areas or cubicles are important for menstrual hygiene management, as girls and women may not want to wash blood from their hands in public spaces.
- Hazardous materials**:** Work areas that may expose workers to hazardous materials may also have a washbasin in proximity to protect workers' health. For example, in the health services sector, washbasins are essential not only next to toilets, but also in medical examination or operating rooms.
- Workplace cooking facilities and canteens: A washbasin with water and soap in a workplace cooking facility is important for routine handwashing before and during food and drink preparation and serving. A washbasin may also be provided in a canteen to remind workers of the need to wash hands before eating and drinking.
- Workplace accommodations: Washbasins with soap and water should also be located in workplace accommodations when they are provided to workers, including in close proximity to toilets and urinals as well in cooking facilities.

3.3.2 Menstrual Hygiene Management (MHM)

Women represent nearly half of the global labor market, and those of menstruating age (~12 to 49 years) are a significant and growing portion of the women employed around the world. Menstruation is a normal biological process and a key sign of reproductive health, yet in some cultures, it is still seen as shameful, and carries with it a significant

stigma. This can be particularly problematic at work, and women often face many challenges when it comes to managing their menstruation during working hours. For example:

- Inadequate and/or unhygienic toilet facilities.
- Lack of privacy in toilet and washing facilities.
- Lack of facilities for disposing of sanitary pads or menstrual cloths.
- Lack of opportunities for MHM when traveling for work, or working far away from toilet facilities.
- Lack of access to appropriate sanitary materials.
- Increased risk of infection from not managing menstruation appropriately
- Difficulty raising MHM issues with male employers, such as the need for additional time to access toilet facilities.
- Cultural restrictions (such as menstruating women not being able to leave the house) may have an impact on the ability to engage in work-related activities.

Despite the many challenges that exist, there are steps that can be taken at the workplace to promote MHM. Adequate MHM refers to the materials, services, and information necessary for girls and women of menstruating age to safely and effectively handle their menstruation, without shame or embarrassment. It is important to note that MHM is truly a cross-cutting WASH issue that extends beyond access to hygiene, and encompasses access to safe water and access to sanitation. Key considerations for MHM at the workplace include:

<u>Toilets</u>

- Provide access to separate toilet facilities that are accessible for all women, and taking into account disabled female workers.
- Ensure toilets are safely located and private, including locks inside the toilet doors.
- Ensure toilets have appropriate lighting for changing menstrual materials.
- Provide facilities for the disposal of used menstrual materials. Such as a waste bin with a lid inside the toilet cabin – or an attached incinerator. If waste bins are provided then a system needs to be in place for emptying the waste bins and ensuring materials are disposed of hygienically.

<u>Washing facilities</u>

- Provide access to washing facilities that are accessible for all women.
- Ensure that these washing facilities are private so that women can comfortably wash their hands, their bodies, and menstrual materials.

<u>Workplace organisation</u>

- Have a discrete supply of menstrual materials available at work.
- Provide awareness raising sessions on MHM for girls and women by a health professional.
- Include men in awareness raising, particularly male managers and supervisors, in order to increase understanding of MHM, such as increased time for using sanitary facilities.

- Promote a supportive environment where girls and women can manage menstruation without embarrassment or stigma.

IV. MINIMUM STANDARDS FOR WASH SET BY THE GOVERNMENT

4.1 Occupational Health Standards

In the Regulation of the Minister of Health of the Republic of Indonesia Number 70 of 2016 About Industrial Work Environment Health Standards and Requirements, guidelines related to WASH conditions in the workplace are stated in the Quality Standards (*Standar Baku Mutu – SBM*), and Industrial Work Environment Health Requirements. Environmental Health Quality Standards provide a reference for standards and requirements for health in the industrial work environment that can be used in risk management for occupational safety and health in the workplace. Environmental Health Quality Standards are the concentrations/levels of each **environmental media parameter** determined in the context of protecting the health of workers according to the unit in the form of the minimum number required, or the maximum or allowable range, depending on the characteristics of the parameters. The following are environmental media parameters related to WASH.

4.1.1 Water Environment Media

Water environment media includes drinking water and water for hygiene and sanitation purposes, both in quantity and quality.

4.1.1.1 Adequacy of drinking water and water for hygiene and sanitation purposes

Adequacy of drinking water for industrial work environments is calculated based on the type of work and the length of hours each worker works for each day. The quality standards (SBM) below apply generally to every worker on a daily basis. If the type of work requires more drinking water, then the needs are adjusted to the type of work. Meanwhile, the adequacy of water for hygiene and sanitation purposes is calculated based on the minimum needs associated with basic health protection and personal hygiene. The availability of water as much as 20 liters/person/day is only sufficient for minimum hygiene and sanitation needs, so to maintain optimal health conditions for workers, more water volume is required, which usually ranges from 50-100 liters/person per day (Table 16).

Table 4.1 Quality Standards for adequacy of drinking water and water for hygiene and sanitation purposes

No.	Keperluan	Satuan	Minimum
1.	Minum	liter/org/hari	5
2.	Higiene dan Sanitasi	liter/org/hari	20

4.1.1.2 Quality of Drinking Water and Water for Hygiene and Sanitation Purposes

Drinking Water

Quality standards (SBM) for drinking water include physical, biological, chemical and radioactivity qualities. Mandatory parameters must be checked periodically in accordance with applicable regulations, while additional parameters are parameters that must be checked only for areas that indicate there is chemical contamination associated with these additional chemical parameters.

Mandatory parameters for Physical Quality Standards for drinking water include 8 parameters, namely odor, taste, temperature, color, dissolved solids (TDS), and turbidity (Table 17). Determination of the maximum level based on health considerations through a tolerable daily intake of 2 liters/person/day with an average body weight of 60 kg.

Table 4.2 Physical Quality Standards for Drinking Water

No.	Parameter Wajib	Unit	SBM (Kadar maksimum yang diperbolehkan)	Keterangan
	Parameter yang tidak langsung berhubungan dengan kesehatan			• PMK 492/Menkes/Per /IV/2010 tentang Persyaratan Kualitas Air Minum • WHO (2011)
1.	Bau		Tidak berbau	
2.	Rasa		Tidak berasa	
3.	Suhu	°C	Suhu udara ± 3	
4.	Warna	TCU	15	True Color Unit
5.	Total zat padat terlarut (*Total Dissolved Solid*)	mg/l	500	
6.	Kekeruhan	NTU	5	Nephelometric Turbidity Unit

Table 4.3 contains the biological Quality Standards for drinking water that must be fulfilled so that the quality of drinking water is safe from biological contaminants because it is directly related to health protection. There are 2 indicators to assess the biological quality, namely Escherichia coli and total coliform bacteria which must be undetectable in 100 ml of the tested drinking water sample.

Table 4.3 Biological Quality Standards for Drinking Water

No.	Parameter Wajib	Unit	SBM (Kadar maksimum yang diperbolehkan)	Keterangan
1.	*E. coli*	CFU/100 ml sampel	0	0 setara dengan <1 pada MPN (*Most Probable Number*) index
2.	Total Bakteri Koliform	CFU /100 ml sampel	0	0 setara dengan <1 pada MPN (*Most Probable Number*) index

Keterangan: CFU (*Colony Forming Unit*)

Quality Standards for drinking water chemistry includes mandatory and additional parameters, both inorganic and organic chemistry. All parameters are within the maximum allowable levels except for the degree of acidity (pH) which is the lowest and highest allowed range (Table 4.4).

Table 4.4 Drinking Water Chemical Quality Standards

No.	Parameter	Unit	SBM (Kadar maksimum yang diperbolehkan)	Keterangan
Wajib				
	pH		6,5-8,5	
Kimia an-organik (Yang berhubungan langsung dengan kesehatan)				
1.	Arsen	mg/l	0,01	
2.	Fluorida	mg/l	1,5	
3.	Total Kromium	mg/l	0,05	
4.	Kadmium	mg/l	0,003	
5.	Nitrit, (Sebagai NO_2^-)	mg/l	3	
6.	Nitrat, (Sebagai NO_3^-)	mg/l	50	
7.	Sianida	mg/l	0,07	
8.	Selenium	mg/l	0,01	
Kimia Anorganik (Yang tidak berhubungan langsung dengan kesehatan)				
1.	Aluminium	mg/l	0,2	
2.	Besi	mg/l	0,3	
3.	Kesadahan	mg/l	500	
4.	Khlorida	mg/l	250	
5.	Mangan	mg/l	0,4	
6.	Seng	mg/l	3	
7.	Sulfat	mg/l	250	
8.	Tembaga	mg/l	2	
9.	Amonia	mg/l	1,5	
Tambahan				
Bahan Anorganik				
10.	Air raksa	mg/l	0,001	
11.	Antimon	mg/l	0,02	
12.	Barium	mg/l	0,7	
13.	Boron	mg/l	0,5	
14.	Molybdenum	mg/l	0,07	
15.	Nikel	mg/l	0,07	
16.	Sodium	mg/l	200	
17.	Timbal	mg/l	0,01	
Bahan Organik				
1.	Zat organik (KMnO4)	mg/l	10	
2.	Deterjen	mg/l	0.05	
3.	Chlorinated Alkanes			
	a. Carbon tetrachloride	mg/l	0,004	
	b. Dichloromethane	mg/l	0,02	
	c. 1,2-Dichloroethane	mg/l	0,05	
4.	Chlorinated Ethenes			
	a. 1,2-Dichloroethene	mg/l	0,05	
	b. Trichloroethene	mg/l	0,02	
	c. Tetrachloroethene	mg/l	0,04	
5.	Aromatic Hydrocarbons			
	a. Benzene		0,01	
	b. Toluene	mg/l	0,7	
	c. Xylenes	mg/l	0,5	
	d. Ethylbenzene	mg/l	0,3	
	e. Styrene	mg/l	0,02	
	f. Ethylbenzene	mg/l	0,3	

No.	Parameter	Unit	SBM (Kadar maksimum yang diperbolehkan)	Keterangan
6.	Chlorinated benzenes			
	a. 1,2-Dichlorobenzene (1,2 DCB)	mg/l	1	
	b. 1,4-Dichlorobenzene (1,4 DCB)	mg/l	0,3	
7.	Lain-lain			
	a. Di (2-ethylhexyl) phthalete	mg/l	0,008	
	b. Acrylamide	mg/l	0,0005	
	c. Epichlorohydrin	mg/l	0,0004	
	d. Hexachlorobutadine	mg/l	0,0006	
	e. Ethylenediaminetetra acetic acid (EDTA)	mg/l	0,6	
	f. Nitrilotriacetic acid (NTA)	mg/l	0,2	
Pestisida				
1.	Alachlor	mg/l	0,02	
2.	Aldicarb	mg/l	0,01	
3.	Aldrin dan dieldrin	mg/l	0,00003	
4.	Atrazine	mg/l	0,002	
5.	Carbofuran	mg/l	0,007	
6.	Chlordane	mg/l	0,0002	
7.	Chlorotoluron	mg/l	0,03	
8.	DDT	mg/l	0,001	
9.	1,2 Dibromo-3-chloropropane (DBCP)	mg/l	0,001	
10.	2,4 Dichloropenoxyacetic Acid (2,4-D)	mg/l	0,03	
11.	1,2 Dichloropropane	mg/l	0,04	
12.	Isoproturon	mg/l	0,009	
13.	Lindane	mg/l	0,002	
14.	MCPA	mg/l	0,002	
15.	Methoxychlor	mg/l	0,02	
16.	Metolachlor	mg/l	0,01	
17.	Molinate	mg/l	0,006	
18.	Pendimethaline	mg/l	0,02	
19.	Pentachlorophenol (PCB)	mg/l	0,009	
20.	Permenthrin	mg/l	0,3	
21.	Simazine	mg/l	0,002	
22.	Trifuralin	mg/l	0,02	
23.	Chlorophenoxy herbicides selain 2,4-D dan MCPA			
	a. 2,4-DB	mg/l	0,090	
	b. Dichloroprop	mg/l	0,10	
	c. Fenoprop	mg/l	0,009	
	d. Mecoprop	mg/l	0,001	
	e. 2,4,5-Trichlorophenoxyacetic acid	mg/l	0,009	
Disinfektan dan hasil sampingannya				
1.	Disinfektan			
	a. Chlorine	mg/l	5	

No.	Parameter	Unit	SBM (Kadar maksimum yang diperbolehkan)		Keterangan
2.	Hasil sampingan				
	a. Bromate	mg/l	0,01		
	b. Chlorate	mg/l	0,7		
	c. Chlorite	mg/l	0,7		
	d. Chlorophenols	mg/l			
	2,4,6 Trichlorophenol (2,4,6 TCP)	mg/l	0,2		
	Bromoform	mg/l	0,1		
	Dibromochloromethane (DBCM)	mg/l	0,1		
	Bromodichloromethane (BDCM)	mg/l	0,06		
	Chloroform	mg/l	0,3		
	e. Chlorinated acetic acids				
	Dichloroacetic acid	mg/l	0,05		
	Trichloroacetic acid	mg/l	0,02		
	f. Chloral hydrate	mg/l			
	g. Halogenated acetonitrilies				
	Dichloroacetonitrile	mg/l	0,02		
	Dibromoacetonitrile	mg/l	0,07		
	h. Cyanogen chloride (scbagai CN)	mg/l	0,3		

Quality Standards for radioactivity in drinking water based on WHO guidelines (2011) includes gross alpha and gross beta, as a screening for radionuclide contamination in water (Table 4.5). The unit used for SBM radioactivity is Becquerel/liter of drinking water, which is the unit of concentration of radioactive activity that disintegrates per second. Gross alpha is related to TDS because alpha radiation is very easily absorbed by particles in water so that high TDS interferes with the sensitivity of alpha radiation examinations. While beta radiation is associated with potassium (K-40) levels in drinking water.

Table 4.5 Radioactivity Quality Standards for Drinking Water

No.	Parameter Tambahan	Unit	SBM (Kadar maksimum yang diperbolehkan)	Keterangan
1.	Gross alpha	Bq/L	0,5	
2.	Gross beta	Bq/L	1	Bq/L (Becquerel/ liter)

Water for Hygiene and Sanitation Purposes

Water quality standards for hygiene and sanitation purposes include physical, biological, and chemical qualities. Mandatory parameters are parameters that must be checked periodically in accordance with applicable laws and regulations, while additional parameters are only required to be checked if geohydrological conditions indicate a potential pollution associated with additional parameters. The water is used for maintaining personal hygiene and ablution for workers as well as for sanitation purposes such as urinals and toilets.

Table 4.6 lists the mandatory water physical parameters that must be checked for hygiene and sanitation purposes. The number of parameters is the same as drinking water but the maximum allowable levels are different because the water is not for drinking but only for gargling.

Table 4.6 Physical Water Quality Standards for Hygiene and Sanitation Purposes

No.	Parameter Wajib	Unit	SBM (Kadar maksimum yang diperbolehkan)	Keterangan
1.	Kekeruhan	NTU	25	
2.	Warna	TCU	50	
3.	Zat padat terlarut (*Total Dissolved Solid*)	mg/l	1000	
4.	Suhu	°C	suhu udara ± 3	
5.	Rasa		tidak berasa	
6.	Bau		tidak berbau	

The parameters of the biological Quality Standards of water for hygiene and sanitation purposes are the same as for drinking water but the levels are different for total coliforms because they are not used for drinking water (Table 4.7).

Table 4.7 Water Biological Quality Standards for Hygiene and Sanitation Purposes

No.	Parameter	Unit	SBM (Kadar maksimum yang diperbolehkan)	Keterangan
1.	Total coliform	CFU /100 ml	50	
2.	*E. coli*	CFU /100 ml	0	

There are nine chemical parameters that must be checked periodically for water chemical SBM for hygiene and sanitation purposes, while the additional parameters are 10 parameters and each level can be seen in Table 23.

Table 4.8 Water Chemical Quality Standards for Hygiene and Sanitation Purposes

No.	Parameter	Unit	SBM (Kadar maksimum yang diperbolehkan)	Keterangan
Wajib				
	pH		6,5-8,5	
Anorganik				
1.	Besi	mg/l	1	
2.	Fluorida	mg/l	1,5	
3.	Kesadahan ($CaCO_3$)	mg/l	500	
4.	Mangan	mg/l	0,5	
5.	Nitrat, sebagai N	mg/l	10	
6.	Nitrit, sebagai N	mg/l	1	
7.	Sianida	mg/l	0,1	
Organik				
8.	Deterjen	mg/l	0,05	
9.	Pestisida total	mg/l	0,1	
Tambahan				
Anorganik				
1.	Air raksa	mg/l	0,001	
2.	Arsen	mg/l	0,05	
3.	Kadmium	mg/l	0,005	
4.	Kromium (valensi 6)	mg/l	0,05	
5.	Selenium	mg/l	0,01	
6.	Seng	mg/l	15	
7.	Sulfat	mg/l	400	
8.	Timbal	mg/l	0,05	
Organik				
9.	Benzene	mg/l	0,01	
10.	Zat organik ($KMNO_4$)	mg/l	10	

4.1.2 Facilities and Buildings

4.1.2.1 Quality Standards (SBM) for Hygiene and Sanitation Facilities

The quality standards (SBM) for toilet facilities for industrial workers are determined based on a ratio that is the ratio of the number of toilets to the number of workers. The ratio of toilet facilities differs between men and women. If the toilet is used by male workers, there must be a urinal/urinary at most 1/3 of the number of toilets provided (Table 4.9).

Table 4.9 Toilet Facilities Quality Standards

No.	Jumlah Toilet	Jumlah Pekerja
1.	1	15
2.	2	16 – 35
3.	3	35 – 55
4.	4	56 – 80
5.	5	81 - 110
6.	6	111 - 150
Ditambah 1 toilet setiap tambah 40 org		> 150

4.1.2.2 Liquid Waste Quality Standards

Wastewater is the residue from a business and/or activity in liquid form. Meanwhile, domestic wastewater is wastewater originating from business activities and/or settlements, restaurants, offices, trade, apartments, and dormitories. Wastewater quality standard is a measure of the limit or level of pollutant elements and/or acceptable amount of pollutant elements in wastewater to be discharged or released into water media from a business and/or activity. Liquid waste quality standards for various types of industries are set by referring to the Regulation of the Minister of Environment and Forestry Number 5 of 2014 concerning Wastewater Quality Standards.

4.2 Occupational Health Requirements

4.2.1 Water Media

Drinking Water

- Derived from improved/protected water sources (pipes, protected springs, protected boreholes, protected dug wells and protected rainwater catchments)
- Available in sufficient quantities and continuously
- Drinking water quality is checked regularly
- Meet the physical quality

Water for Hygiene and Sanitation Purposes

- Derived from improved/protected water sources (pipes, protected springs, protected boreholes, protected dug wells and protected rainwater catchments)
- Available in sufficient quantities and continuously
- Water from wastewater treatment/grey water is only used for flushing toilets and watering plants
- Water quality should be checked regularly
- Meet the physical quality

4.2.2 Facilities and Buildings

Drinking Water Facilities

- If the water source is piped (PDAM), there is no cross connection with the wastewater pipe
- If the groundwater source is non-piped, the facilities are protected from sources of contamination, both domestic and industrial waste
- Not a breeding ground for vectors and disease-carrying animals
- When treating drinking water chemically, the type and dosage of chemicals must be correct
- If using a water storage container, it must be cleaned regularly

Water Facilities for Hygiene and Sanitation Purposes

- If the water source is piped (PDAM), there is no cross connection with the wastewater pipe
- If the groundwater source is non-piped, the facilities are protected from sources of contamination, both domestic and industrial waste
- Not become a breeding ground for vectors and disease-carrying animals
- When treating drinking water chemically, the type and dosage of chemicals must be correct
- If using a water storage container, it must be cleaned regularly
- A good water use saving system is available

Sanitation Facilities

- There are adequate toilets and hand washing facilities equipped with running water, soap, hand dryers, and closed trash cans
- There are toilets and hand washing facilities that accommodate disabled workers
- Easy and effective to clean regularly
- The floor is waterproof, not slippery and always kept dry
- Availability of special and adequate cleaning equipment and disinfection materials

Waste Water Disposal Facilities

- Wastewater from various sources can flow smoothly and the channel is closed
- Adequate wastewater treatment plant (WWTP) is available

V. COSTS OF WASH INVESTMENTS

There are two main activities that businesses can undertake to improve WASH access at work places. The type of activity that will be carried out is a company investment to improve access to WASH which is designed according to needs based on the self-assessment process. These two main activities are:

- Improvement of WASH provision and facilities, and
- Implementation of educational and behavioral change materials and activities

5.1 WASH Infrastructure

Currently, many companies and non-governmental organizations have made various efforts to play an active role in improving settlement infrastructure, including the development of drinking water supply and sanitation infrastructure.

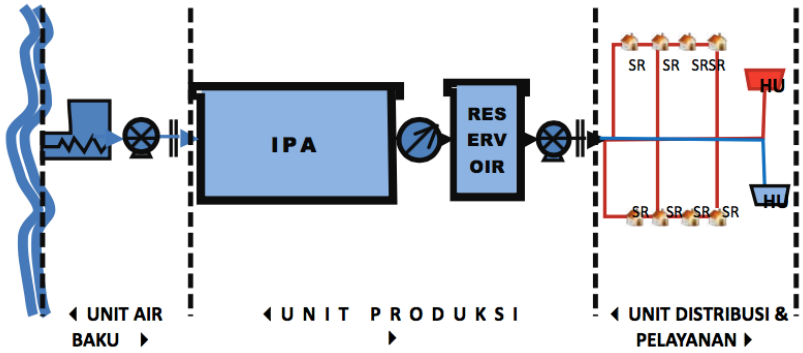
The following are various types and estimates of the costs of developing drinking water and sanitation infrastructure that can be used by companies that wish to contribute to infrastructure development both to improve WASH facilities at work and in the surrounding community through Corporate Social Responsibility (CSR) programs. The information presented is taken from the guidelines compiled by the Directorate General of Human Settlements of the Ministry of Public Works as a Central Government agency that has the task and function of providing guidance, regulation, and supervision of sustainable infrastructure development including clean water and sanitation facilities.

It is hoped that there will be development synergies between the efforts made by the government and every stakeholder including companies in improving access to WASH in the workplace as well as in implementing their CSR programs. In addition, the development of clean water and sanitation infrastructure will be in accordance with applicable technology standards and can be utilized by the community in a sustainable manner.

5.1.1 Drinking Water Development

The Drinking Water Supply System (SPAM) for residential areas can be carried out through a piping network system and/or non-pipeline network. SPAM with a pipeline network may include: raw water units, production units, distribution units, service units, and management units. Some examples of non-pipeline SPAM include: shallow wells, hand pump wells, rainwater reservoirs, water terminals, water tankers, bottled water installations, or spring protection buildings.

Broadly speaking, the development of SPAM through a pipeline network consists of 3 (three) main components, namely: (1) Raw Water Unit, (2) Production Unit, and (3) Distribution Unit.



5.1.1.1 Raw Water Unit

Raw water for household drinking water, hereinafter referred to as raw water, is water that can come from surface water sources, groundwater basins and/or rainwater that meets certain quality standards as raw water for drinking water.

The raw water intake building for drinking water (intake) is an important unit in the drinking water supply system to capture drinking water with all its equipment that is built at a water source location, namely surface water (rivers, lakes, lakes, etc.), springs, and ground water. The construction of the raw water intake building requires a guarantee for the placement of the building to ensure both the quantity and quality of raw water.

Surface Water

The selection of the type of intake building for surface water is carried out based on considerations of discharge, fluctuations in water level, depth, and field conditions. Broadly speaking, there are 5 (five) types of intake structures for surface water, namely:

- Free pick up type
- Weir Type
- Pontoon Type
- Bridge Type (intake bridge)
- Infiltration Channel Type

The main components of surface water intake are as follows:

- Garbage filter
- Inlet/intake pipe
- Water Pump
- Protective buildings

Contoh Intake Jembatan

Contoh Intake Ponton

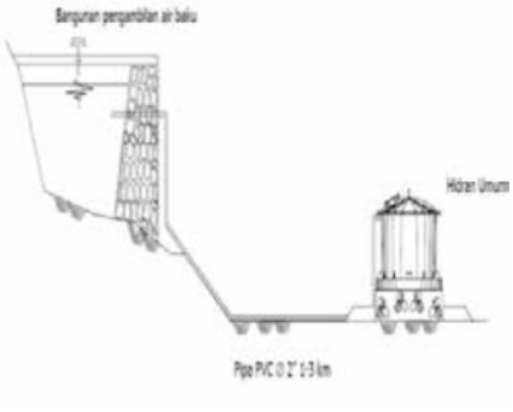
Water Springs

In general, broncaptering buildings are divided into catchment buildings and collection buildings (wells or other forms of buildings). The consideration for selecting the catchment structure is that the springs tend to appear in a horizontal direction where the original water level does not change, and springs that emerge from the foot of the hills. Meanwhile, for collecting buildings, springs tend to appear in a vertical direction, and springs that appear in flat areas.

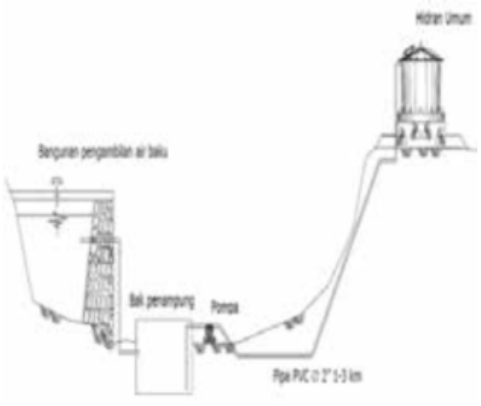
The equipment for catching and collecting springs is an outlet, overflow, drain, flow meter, erosion barrier construction, manhole, perimeter drainage channel, and ventilation pipe.

The estimated investment value is around IDR 80 million per liter per second

Broncaptering dengan Pengaliran Gravitasi

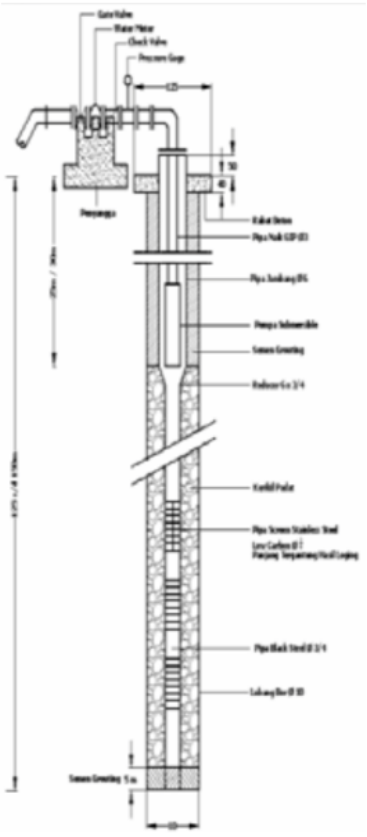


Broncaptering dengan Pemompaan



Groundwater

The selection of groundwater extraction structures is divided into shallow wells and deep wells.



Shallow well

- The selection of shallow wells is generally carried out by considering the water demand in the small planning area, the capacity of the well is sufficient at critical/drought times.
- Equipment for building shallow wells with a dug well system in the form of concrete buis, or waterproof masonry, insulation for contamination with surface water, concrete poles, hand pumps. Meanwhile, equipment with a hand pump well system (SPT) includes a standpipe (suction pipe), casing pipe, filter, and shock reducer.

Deep well

- Selection of deep wells is carried out by considering that the water demand in the planning area is quite large, the capacity of deep wells is sufficient while the capacity of shallow wells is not sufficient.
- Deep wells in the form of hand pump wells (SPT) with a maximum depth of 30 meters, including standpipes (suction pipes), casing pipes, filters, and shock reducers. Submersible pump wells include suction pipes, casing pipes, filters, observation pipes, reducers, hubcap sockets, well covers, gravel, panels and electrical energy.

The estimated investment value:

Kedalaman (meter)	Biaya Rp Juta
40	34
70	50
100	67
150	95

5.1.1.2 Production Unit

A production unit is a building or equipment that can be used to process raw water into drinking water through physical, chemical and/or biological processes. The production unit may consist of a processing building and its equipment, operational equipment,

measurement tools and monitoring equipment, as well as a drinking water storage building.

Drinking Water Treatment Plant

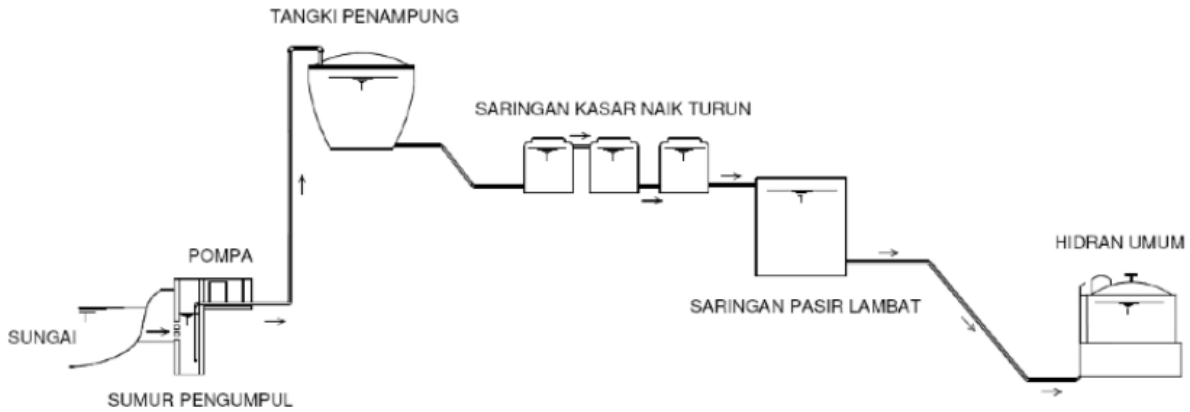
There are several types of Water Treatment Plants that can be used to produce and supply drinking water for the community.

Simple Water Treatment Plant (IPAS)

IPAS is a water treatment building capable of processing raw water into clean water for communal services. The IPAS raw water treatment building is capable of treating water with a turbidity level of less than 150 NTU. IPAS main components:

- Intake (PVC pipe Ø 100 mm with empty river stone construction)
- Gathering Well
- Pump
- Reservoir Tank
- PVC pipe
- Wooden stand
- SKNT Tank (Coarse Filter Up And Down)
- Slow Sand Filter (SPL)
- Public Hydrant
- Power supply

The investment costs for the construction or provision of IPAS are highly dependent on the size of the capacity and the local conditions in which the IPAS is developed



Processing Installation Package

Water The water treatment installation package unit, hereinafter referred to as the IPA package unit, is a package unit that can treat raw water through certain physical, chemical and/or biological processes in a compact form so as to produce drinking water that meets

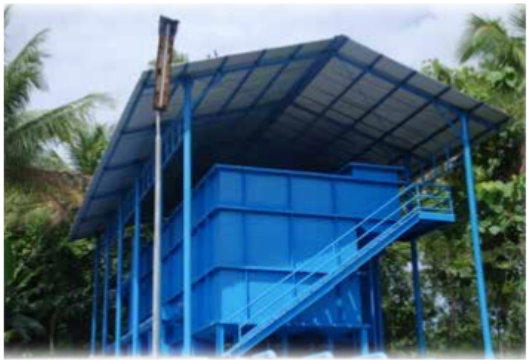
the applicable quality standards, designed and manufactured at a particular location. a place that can then be assembled elsewhere and moved, which is made of steel plate, and plastic or fiber.

Packaged IPA units generally consist of components/a series of facilities and equipment, including filters, mixing tanks, clarification tanks, chlorination, and storage tanks. WTP capacity is designed according to the volume of water demand and potential availability, an average of about 5-50 liters per second, with an estimated 1 l/second to serve 600-800 people.

The investment value for the WTP development is highly dependent on the design capacity and the geographical conditions in which the WTP is developed

In accordance with the conditions of the area to be served, there are several technology options in the form of Package IPA as follows:

- IPA made of steel. The main components of IPA Steel are:
  - Coagulation bath,
  - flocculation basin,
  - Sedimentation tanks,
  - Filtration equipment,
  - Steel construction roof covering
- IPA is made of Fiber. It is a unified building with an iron/steel frame and a protective roof made of fiber glass. Water treatment components which are the main part of the installation are tubs/spaces which are also made of fiberglass.



IPA Baja

IPA Fiber

IPA Mobile System

The Mobile System Drinking Water Processing Installation (IPA) is needed to overcome clean/drinking water problems in post-disaster areas (floods, volcanic eruptions, earthquakes, tsunamis, landslides, etc.).

The IPA capacity of a mobile system is generally designed to be below 1.5 liters/second to serve an emergency of about 1500 people. The main components of the IPA mobile system are:

- Chassis / trailer, equipped with 6 tires with supporting equipment jack / screw type jack as much as 4 units.
- Chassis/trailer towing vehicles
- Mobile system IPA unit measuring 4.00 m long x 1.70 m wide x 1.70 m high, consisting of:
    - Coagulation Unit
    - Flocculation Unit
    - Sedimentation Unit
    - Filtration Unit – Filter, ultra filtration, ultra violet and ozonizer.

The estimated investment value of this Mobile System IPA is around IDR 500 million per unit

<u>SPAM – IKK</u>

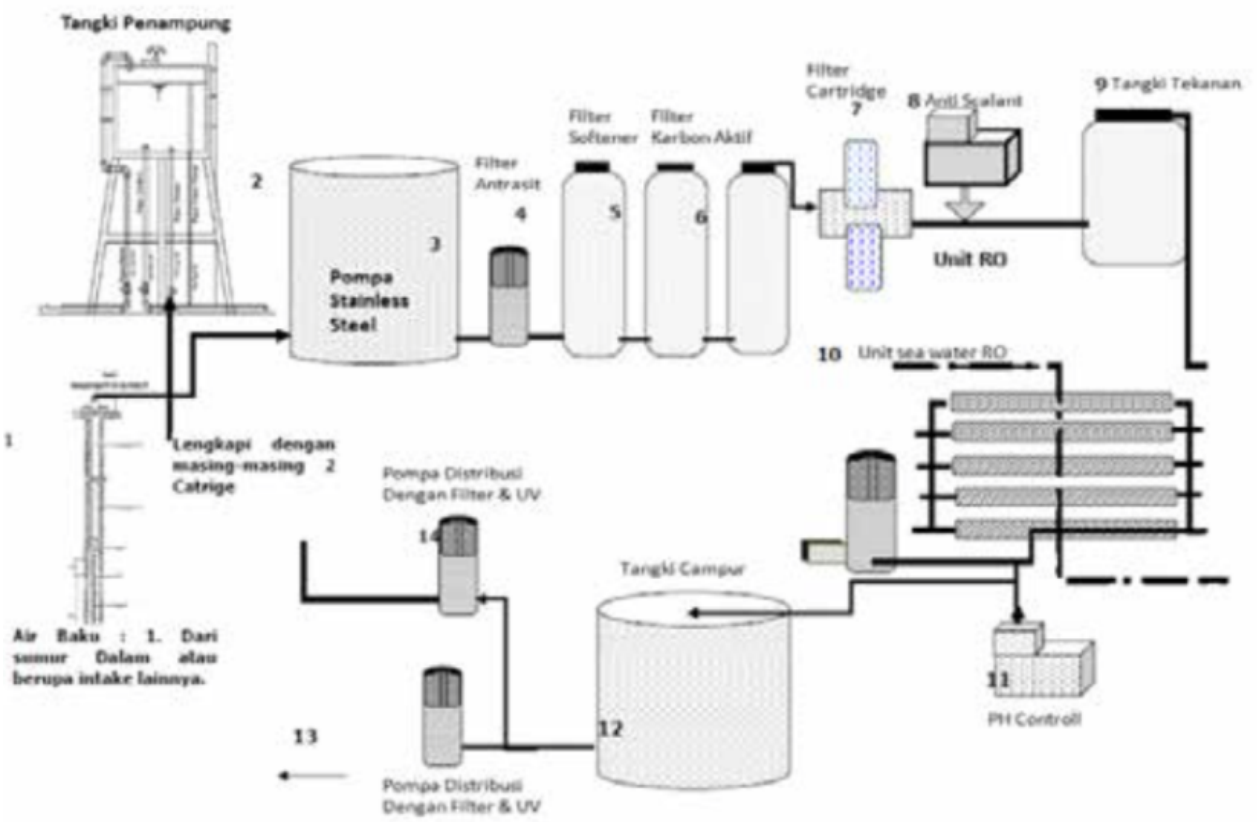
The District Capital Drinking Water Supply System (SPAM-IKK) is a unit that processes water sources into clean water to meet the needs of people living in the sub-district capital. The main components of SPAM – IKK are:

- Protective buildings made of concrete/steel
- Water pump
- Storage Tank
- Purification Tank, and
- Chemical Tank

Production capacities are generally designed for capacities up to 50 liters/second and can serve approx., with the investment value being influenced by the amount of production capacity, type and quality of raw water, as well as local conditions where the installation will be developed

Reverse Osmosis

Water treatment through a Reverse Osmosis (RO) system is a water purification process technology using a semi-permeable membrane and a reverse osmosis process. The processing capacity is generally designed for a small scale with a production capacity ranging from 20 to 50 m3 per day to serve around 80 to 150 families. The investment value and operating and maintenance costs are strongly influenced by the quality of the treated raw water.

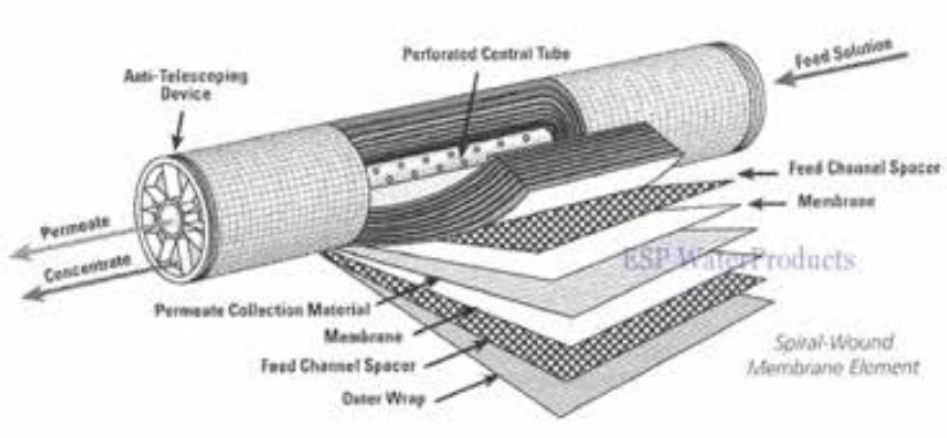


Skema Pengolahan Air dengan teknologi reverse osmosis

Reverse osmosis system components and equipment include:

- Protective buildings/houses
- The main components of the Processing Unit (treatment plant):
    - Filter unit with pressure-resistant and rust-resistant Polyglass tank material
    - Pumps from Stainless Steel
    - Transparent filter housing
    - The raw water tank is also made of anti-rust material
- Main components of reverse osmosis unit:
    - One unit of Automatic antiscalant injector consists of: Dosing Pump for antiscalant chemicals and Antiscalant chemical tank

- One unit of Reverse Osmosis Type depending on the treated water
- Sea water or brackish water
- One unit pH balance injector with chemical tank.
- Disinfection using an ozonizer or UV light
- Processed water storage tank made of Food grade material.
- Distribution with Public Hydrants and/or Water Terminals.
- IPA RO Protective Buildings are adapted to site conditions.



Peralatan Reverse Osmosis

Peat Water Treatment System

Raw water derived from peat water has characteristics, is brownish in color with a color scale between 124-571 ppm Pt-Co, high organic matter content, low pH between 3.7-4.3, and low hardness value of 38-280 mg/L KMnO4. The characteristics of the peat water are specific, depending on the location, the type of vegetation, the type of soil where the peat water is located, the thickness of the peat, the age of the peat, and the weather. Raw water sources originating from peat require a special treatment technology, namely the peat water treatment plant (IPAG).

Processing equipment components:

- Sedimentation tub/drum,
- Filter tank/drum,
- Faucets & filter pipes,
- Wooden/concrete stands/supports

Adjuvant :

- Lime as a neutralizing agent,
- Alum sulfate/clay as coagulant
- Activated carbon to absorb odors and colors

Container/Reservoir

The reservoir/reservoir functions as a reservoir/storage of water, both from processed products (if using processing) or directly from springs. In addition, the reservoir serves to overcome the problem of fluctuations in water demand and is part of the management of water distribution in the community.

The reservoir building can be in the form of cast concrete, masonry, fiber which is adjusted to the needs and conditions. The reservoir must be watertight and not easily leak.

Container/reservoir components are:

- Foundation (concrete or masonry)
- Reservoir tub (concrete, masonry, fiber)
- Inlet pipe
- Outlet pipe
- Drain pipe
- Stop faucet

The capacity of the reservoir adjusts the planning needs for its utilization. Drinking Water Reservoir is an infrastructure to accommodate clean water used by the community. The capacity is about 3-6 liters per second or about 10-20 M 3 per hour (300-500 M3 per day), to serve about 1,000 Heads of Families (4000 people). Its main components are:

- Steel/Concrete Tank
- Protective structures with steel/concrete frames
- Piping system

Distribution Unit

Consists of a pumping system, distribution network, shelter buildings, measuring instruments and monitoring equipment. The distribution unit is obliged to provide certainty of quantity, quality of water and continuity of flow that guarantees flow 24 hours per day.

Transmission Pipe

Transmission pipe is a pipe used to convey raw water to the treatment unit or deliver clean water, from the treatment unit to the main distribution unit or distribution reservoir.

The length of the pipe according to conditions, the diameter varies between 3-6 inches. The water flow capacity is according to the design, about 4-8 liters per second, equipped with adequate connections/fittings, and a flow meter.

Investment needs depend on the type of pipe, diameter and distance/length. It is estimated that the investment value is around IDR 2-3.5 million per meter

Piping Network

The pipeline network functions to carry clean water from the production unit to the starting point of the distribution network, as well as distribution pipelines that connect the transmission pipeline with the utilization unit in the form of a Public Hydrant (HU). Main components of the network are:

- Pipe of suitable diameter
- Connections/fittings
- Main Flow Meter

The flow capacity is as follows:

Kapasitas Sistem (L/det)	Jumlah Rumah Tangga yang dilayani	Desain Aliran (L/det)
2,5	150-300	2,5
5,0	>300	5,0

Standard PVC, HDPE, or galvanized pipes are used as follows:

Jenis Pipa	Standar	Kelas Pipa	Tekanan Kerja Minimal
Pipa PVC	SNI 03-6419-2000/ SII-0344-1982	S-12,5	8 bar
Pipa HDPE	SNI 06-4829-1998-A/ ISO 4427.96	SDR-17 (5-8)	8 bar
Pipa Galvani (GIP)		Medium	8 bar

Pipe diameters as follows:

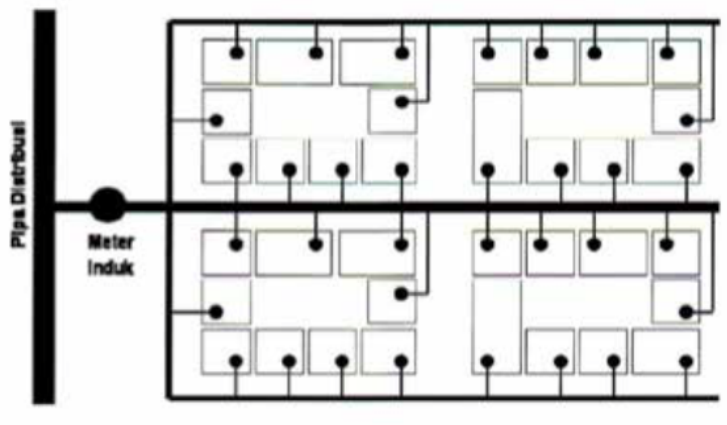
Kapasitas	Diameter hasil perhitungan (mm)	Diameter hasil yang digunakan (mm)
5.0	100	100
2.5	75	100

The flow of water can use a gravity or pumping system according to geographical conditions.

The investment value depends on the number of connections/number, types of pipes, and the distance between houses. The estimated installation and investment costs are around IDR 250 – IDR 350 thousand per meter of pipe

Main Water Meter (WMI)

WMI is an important instrument in the distribution of raw water to user areas. This equipment is to control the volume of water to be treated and produced. WMI equipment is used at WTPs, reservoirs, and at entry points to communal water distribution.



Meter Induk Komunal model Rukun Tetangga (RT)

Pumping

Under certain conditions, the distribution of clean water flow cannot use a gravity system, so a pump station is needed. The flow capacity ranges from 1 liter/second to 3 liters/second with different pump powers, depending on the difference in height between the source and the user's house.

Main components of drinking water distribution pump station:

- Water pump
- Tanks and towers
- Flow Meter
- Electric panel
- Support & protection structures

Investment value depends on the type and power of the pump in question. It is estimated that around Rp. 25 to Rp. 60 million

The selection of the type of pump is based on the quality of the water handled by the pump. The table below provides information for considerations in pump selection.

Selection of Surface Water Source Raw Water Pumps:

	Tipe Pompa	Bentuk Impeler	Material padat (terbawa)
Air Permukaan	*Non-Clogging Submersible* karena fluktuasi muka air tinggi	*Vortex*	- Abrasif - Viskositas tinggi
		Shrouded Channel	- Serat panjang
		Open impleller	- Serat panjang - Viskositas tinggi - Sampah
		Axial	- Viskositas tinggi
Air Dalam Tanah	*Sumersible deep well*	*Sentrifugal impeller*	- Bebas benda padat - Viskotas rendah
	Deep well turbine pump (kedalaman <40 m	Aliran Campur *(mixed flow impeller)*	- Bebas benda padat - Viskotas rendah

Selection of Distribution Pump or Booster Type:

Instalasi	Fluida	Kapasitas Pompa	Jenis Pompa
Distribusi/*Booster*	Air Bersih	Kurang dari 200 L/det	*Centrifugal Single Suction*
		Lebih dari 200 L/det	*Centrifugal Double Suction*

Service Unit

Consists of house connection and public hydrant. To measure the amount of service at the connection of houses and public hydrants, a measuring instrument in the form of a water meter must be installed. To ensure its accuracy, water meters must be calibrated periodically by the competent authority.

Public Hydrant

Public Hydrant Tank (HU) is one part of the clean water distribution equipment, which uses a piping system. Public hydrants tank can be made using fiberglass, polyethylene (PE), masonry, ironwood (waterproof), plastic. The minimum height from the ground level is 60 cm, made of fiber glass with a tank wall thickness of 4-5 mm.

Main components of public hydrant are:

- piping network (PVC, PE, GIP)
- 1-3 m3 hydrant tank (as needed)
- booster pump if necessary
- other equipment, among others, in the form of wheelbarrows, 20 liter and 10 liter water jerry cans.

Public hydrant dimensions: (service capacity is around 60 families or 300 people for each hydrant)

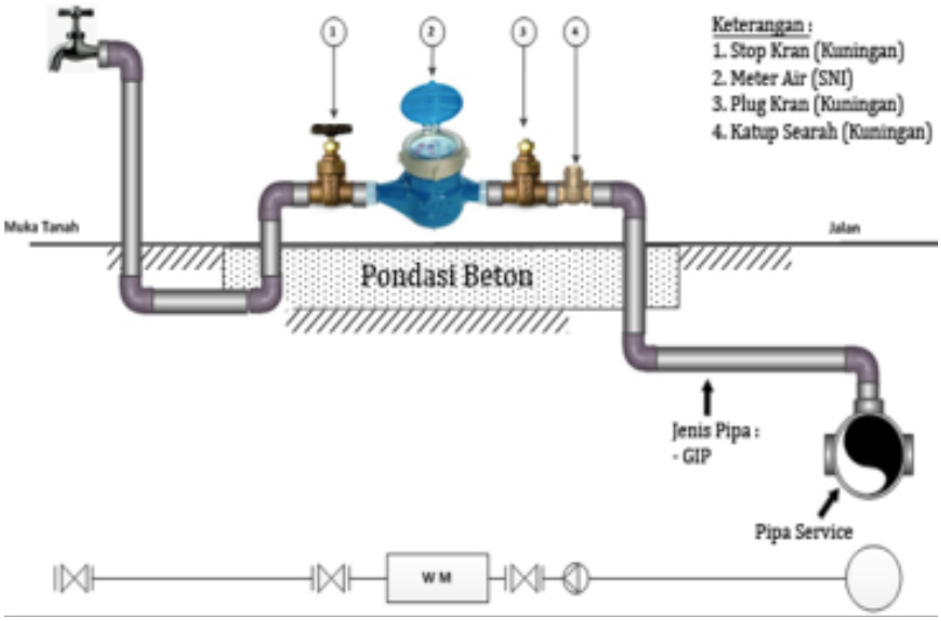
No	Ukuran	Volume	
		3 m^3 (mm)	2 m^3 (mm)
1	Lebar atas	1.900	1.800
2	Lebar bawah	2.100	1.700
3	Tinggi	1.100	1.100
4	Lubang pemeriksa dan penutup	600	600
5	Pipa Intlet	25	25
6	Pipa Outlet	19	19
7	Pipa ventilasi	17	19

Investment costs depend on capacity, estimated at around IDR 150,000 per capita which served (About Rp 45 million)

Home Connection

House Connection (SR) is a drinking water service from the piping system through a direct connection to the house with raw water originating from the network system. The main components for SR are:

- Water Meter
- Water Meter Protector
- Stop Faucet
- Pipes, fittings and valves



The pipe material is PVC/PE plastic or galvanized iron with a diameter of ¾ - 1" (inch) meets the appropriate SNI and is able to withstand a working pressure of at least 8 bar.

Non Piping Service Unit

Clean Water Tank

One way to distribute drinking water to the community is to provide clean water infrastructure in the form of clean/drinking water tanks (TABM). Drinking Water Tank is useful for storing clean water. Very suitable for areas where the availability of clean water is limited. Its main components are:

- Buffer Building
- Tank
- Piping as needed
- Flow Control Valve
- Equipped with filters
- Water pump (if needed)

Tanks made of steel or fiber glass with a thickness of more than 2 mm.

Investment requirements are depending on the type/material of the tank and its capacity.

Air Terminal

Water Terminal (TA) is the completeness of the drinking water service method, where water transportation is carried out by water tank cars, then distributed to the public through the Water Terminal Tank (TTA). The main components of the Air Terminal are:

- One unit of water tank car
- Water terminal tank (TTA) with a capacity of 1-3 m^3 (according to needs)
- Other equipment in the form of wheelbarrows, 20 liter jerry cans of water, etc. (as needed).

The capacity is in accordance with the need to serve around 600-1000 people (150-250 families) with a radius of around 1-3 km.

The investment value is around Rp. 250,000 per person, or around Rp. 150-250 million plus a water tank car of around Rp. 350 million

Drinking Water Distribution Truck

For remote areas, the distribution of clean water can use a drinking water tank truck. Its main components are:

- Truck with chassis
- Drinking water tank
- Distribution pipeline

Truck with diesel engine, diesel fuel, and fuel consumption 0.2 liter/km.

Capacity: 5-8 m3 per transport, with an estimated investment value of IDR 350-450 million

Drinking Water Distribution Tanker

For archipelagic areas, clean water distribution must use drinking water tankers. Its main components are:

- Boats made of wood, fiberglass, or mild steel
- Drive motor
- Drinking water tank
- Distribution pipeline
- Moving pumps (Filling and Dispensing) Ships with Diesel Engines, diesel fueled.

Capacity: 5-8 m3 per transport, with a deadweight capacity of 15-25 tons with an investment value of Rp 650-950 million

Drinking Water Infrastructure Development Cost

The estimated cost of developing SPAM pipelines for several service areas is as follows.

PERLUASAN JARINGAN: 300 HA		HARGA SATUAN INVESTASI (Juta Rp./SR)					
Panjang Pipa Transmisi Air Minum	Komponen Investasi SPAM	Kepadatan 70 Rmh/Ha		Kepadatan 50 Rmh/Ha		Kepadatan 20 Rmh/Ha	
		100%	60%	100%	60%	100%	60%
		70 SR/Ha	42 SR/Ha	50 SR/Ha	30 SR/Ha	20 SR/Ha	12 SR/Ha
1.000 m	Unit Air Baku (*)	0,17	0,17	0,17	0,17	0,18	0,19
	Unit Produksi	1,36	1,33	1,36	1,47	1,52	1,54
	Unit Distribusi	1,26	1,84	1,41	2,17	2,19	3,60
	Unit Pelayanan	0,93	0,93	0,93	0,93	0,93	0,93
	Total	**3,72**	**4,27**	**3,87**	**4,74**	**4,82**	**6,26**
5.000 m	Unit Air Baku (*)	0,17	0,17	0,17	0,17	0,18	0,19
	Unit Produksi	1,91	2,10	2,22	2,22	2,23	2,44
	Unit Distribusi	1,26	1,84	1,41	2,17	2,18	3,60
	Unit Pelayanan	0,93	0,93	0,93	0,93	0,93	0,93
	Total	**4,27**	**5,04**	**4,73**	**5,49**	**5,52**	**7,16**
10.000 m	Unit Air Baku (*)	0,17	0,17	0,17	0,17	0,18	0,19
	Unit Produksi	2,54	3,07	2,90	3,28	3,30	3,43
	Unit Distribusi	1,26	1,84	1,41	2,17	2,19	3,60
	Unit Pelayanan	0,93	0,93	0,93	0,93	0,93	0,93
	Total	**4,90**	**6,01**	**5,41**	**6,55**	**6,60**	**8,15**

Note:
- Harga Satuan Investasi Tahun 2008
(*) Panjang Transmisi Air Baku = 100 m; lebih dari 100 m memerlukan dukungan Pemerintah

PERLUASAN JARINGAN: 500 HA		HARGA SATUAN INVESTASI (Juta Rp./SR)					
Panjang Pipa Transmisi Air Minum	Komponen Investasi SPAM	Kepadatan 70 Rmh/Ha		Kepadatan 50 Rmh/Ha		Kepadatan 20 Rmh/Ha	
		100%	60%	100%	60%	100%	60%
		70 SR/Ha	42 SR/Ha	50 SR/Ha	30 SR/Ha	20 SR/Ha	12 SR/Ha
1.000 m	Unit Air Baku (*)	0,14	0,15	0,15	0,17	0,17	0,19
	Unit Produksi	1,33	1,38	1,30	1,43	1,49	1,68
	Unit Distribusi	1,47	1,95	1,64	2,35	2,97	4,26
	Unit Pelayanan	0,93	0,93	0,93	0,93	0,93	0,93
	Total	**3,87**	**4,41**	**4,02**	**4,88**	**5,56**	**7,06**
5.000 m	Unit Air Baku (*)	0,14	0,15	0,16	0,17	0,17	0,19
	Unit Produksi	1,95	1,90	1,86	1,94	2,22	2,64
	Unit Distribusi	1,47	1,95	1,64	2,35	2,97	4,26
	Unit Pelayanan	0,93	0,93	0,93	0,93	0,93	0,93
	Total	**4,49**	**4,93**	**4,58**	**5,39**	**6,29**	**8,02**
10.000 m	Unit Air Baku (*)	0,14	0,15	0,15	0,17	0,17	0,19
	Unit Produksi	2,50	2,35	2,31	2,92	3,02	3,78
	Unit Distribusi	1,47	1,95	1,64	2,35	2,97	4,26
	Unit Pelayanan	0,93	0,93	0,93	0,93	0,93	0,93
	Total	**5,04**	**5,38**	**5,03**	**6,37**	**7,09**	**9,16**

PERLUASAN JARINGAN: 300 HA		HARGA SATUAN INVESTASI (Juta Rp./SR)					
Panjang Pipa Transmisi Air Minum	Komponen Investasi SPAM	Kepadatan 70 Rmh/Ha		Kepadatan 50 Rmh/Ha		Kepadatan 20 Rmh/Ha	
		Potensi Pelanggan		Potensi Pelanggan		Potensi Pelanggan	
		Eksisting	Optimalisasi	Eksisting	Optimalisasi	Eksisting	Optimalisasi
		42 SR/Ha → 70 SR/Ha		30 SR/Ha → 50 SR/Ha		12 SR/Ha → 20 SR/Ha	
1.000 m	Unit Air Baku (*)	0,06		0,07		0,08	
	Unit Produksi	1,55		1,61		1,97	
	Unit Distribusi	0		0		0	
	Unit Pelayanan	0,93		0,93		0,93	
	Total	**2,54**		**2,61**		**2,98**	
5.000 m	Unit Air Baku (*)	0,06		0,07		0,08	
	Unit Produksi	2,18		2,52		2,8	
	Unit Distribusi	0		0		0	
	Unit Pelayanan	0,93		0,93		0,93	
	Total	**3,17**		**3,52**		**3,78**	
10.000 m	Unit Air Baku (*)	0,06		0,07		0,08	
	Unit Produksi	2,46		3,30		3,75	
	Unit Distribusi	0		0		0	
	Unit Pelayanan	0,93		0,93		0,93	
	Total	**3,45**		**4,30**		**4,76**	

Note:
- Harga Satuan Investasi Tahun 2008
(*) Panjang Transmisi Air Baku = 100 m; lebih dari 100 m memerlukan dukungan Pemerintah

PERLUASAN JARINGAN: 100 HA		HARGA SATUAN INVESTASI (Juta Rp./SR)					
Panjang Pipa Transmisi Air Minum	Komponen Investasi SPAM	Kepadatan 70 Rmh/Ha		Kepadatan 50 Rmh/Ha		Kepadatan 20 Rmh/Ha	
		Potensi Pelanggan		Potensi Pelanggan		Potensi Pelanggan	
		Eksisting	Optimalisasi	Eksisting	Optimalisasi	Eksisting	Optimalisasi
		42 SR/Ha → 70 SR/Ha		30 SR/Ha → 50 SR/Ha		12 SR/Ha → 20 SR/Ha	
1.000 m	Unit Air Baku (*)	0,10		0,13		0,12	
	Unit Produksi	1,67		1,76		1,95	
	Unit Distribusi	0		0		0	
	Unit Pelayanan	0,93		0,93		0,93	
	Total	**2,70**		**2,82**		**3,00**	
5.000 m	Unit Air Baku (*)	0,10		0,13		0,12	
	Unit Produksi	2,60		2,62		3,59	
	Unit Distribusi	0		0		0	
	Unit Pelayanan	0,93		0,93		0,93	
	Total	**3,83**		**3,68**		**4,64**	
10.000 m	Unit Air Baku (*)	0,10		0,13		0,12	
	Unit Produksi	4,08		3,15		5,56	
	Unit Distribusi	0		0		0	
	Unit Pelayanan	0,93		0,93		0,93	
	Total	**5,11**		**4,21**		**6,61**	

Note:
- Harga Satuan Investasi Tahun 2008
(*) Panjang Transmisi Air Baku = 100 m; lebih dari 100 m memerlukan dukungan Pemerintah

5.1.2 Domestic Wastewater Treatment

Domestic wastewater is all wastewater originating from bathrooms, kitchens, washing and latrines as well as household industrial wastewater whose characteristics are not much different from household wastewater and do not contain toxic and hazardous materials. Domestic wastewater can be sourced from settlements (households), commercial areas, offices, recreational facilities, apartments, dormitories and restaurants.

Domestic Wastewater Management is an activity to manage domestic wastewater in the context of protecting raw water and improving public health status. Domestic wastewater treatment systems can be grouped into two, namely: Local System (onsite) and Centralized System (off-site).

5.1.2.1 Local Wastewater System (On-Site)

The Local Wastewater Management System or known as the on-site system, which is an integrated physical and non-physical system of residential wastewater infrastructure and facilities in the form of individual and/or communal scale wastewater disposal through initial treatment and equipped with transportation facilities and sewage treatment plants.

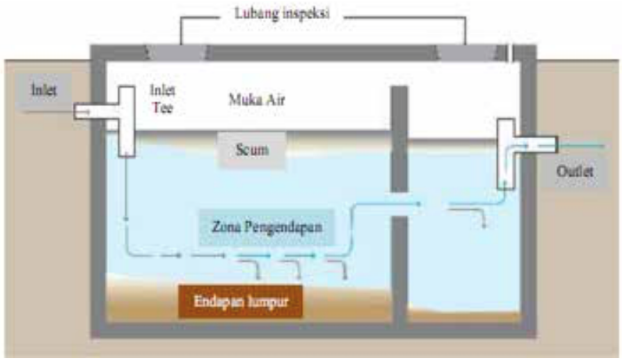
Advantages	Deficiency

• Using simple technology • Requires low cost • The community and each family can provide it yourself • Operation and maintenance by public • Benefits can be felt directly	• Cannot be applied to all areas for example depending on soil permeability, density level and others. • The function is limited to the disposal of human waste and does not accept bathroom waste and used washing wastewater • Operation and maintenance difficult

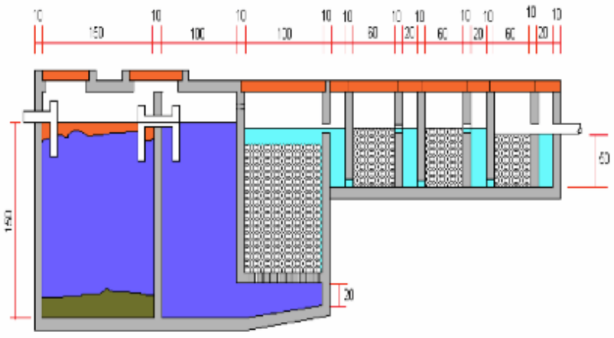
The Local Wastewater Management System according to the scope of service can be classified into two, namely:

Individual Scale (Covering Services for One Residential Unit or Building)

The type of treatment commonly used on an individual scale is the septic tank. A septic tank is a watertight building consisting of one or several compartments that functions to accommodate/treat household wastewater at a very slow flow rate, resulting in the deposition of suspended solids and an opportunity for the decomposition of organic materials. This process runs naturally so that it separates between solids in the form of more stable mud and liquids. The treated liquid will exit the septic tank as effluent and the gas formed will be released through the ventilation pipe. Meanwhile, the mature (stable) sludge will settle to the bottom of the tank and must be sucked regularly every 2-5 years and further processed at the Sludge Treatment Plant (IPLT). Septic tanks can treat mixed wastewater (greywater and blackwater) or separate wastewater (blackwater only).



Skema Tangki Septik Konvensional



Tangki Septik Modifikasi dengan Penambahan Sekat dan Filter

Some of the commonly used types of septic tanks are:

- Septic Tank
- Septic Tank with Leak Field
- Septic Tank with Evapotranspiration
- Septic Tank with Filter

Septic tanks in Indonesia have been standardized in SNI-03 –2398-2001. The construction of the septic tank can be in the form of concrete or one that has been fabricated, generally using fiberglass.

In general, the capacity of the septic tank is about 0.8 – 2 m3 with a cylindrical or cube shape and is planted in the ground at a depth of about 1 – 1.5 meters with a width of 0.8 – 2 meters.

The requirements for the distance of the septic tank to the house and the well are as follows:

Jarak dari	Tangki Septik	Bidang Resapan
Bangunan	1,5 m	1,5 m
Sumur	10 m	10 m
Pipa Air Bersih	3 m	3 m

The investment cost for the septic tank unit only (excluding latrine facilities) is around Rp. 3 to Rp. IDR 5 million per residential unit

Communal Scale (Scope of the Residential Scale and/or MCK – Bathing, Washing, and Defecating – Facility)

Residential scale

One processing unit can be shared by 2 to 10 residential units. The technology commonly used is a modified septic tank (eg by increasing the number of compartments and adding filter media and adjusting the residence time in the tank and tank volume) or by using a prefabricated treatment unit called a biofilter.

Biofilter tanks that are generally sold in the market are made of fiberglass. Each manufacturer has different specifications. The main things that differentiate are usually the shape and size of the unit, the residence time in the tank, the type of microorganisms used, the type of filter media used, as well as the number of chambers and the type of

flow used. Some of the main advantages of using these fabricated units are saving on construction time and unit volume.

Treatment on a residential communal scale requires an additional unit in the form of a pipe that connects the wastewater source in each residence with the installed treatment plant.

The investment cost from piping to wastewater treatment plants is around 4 s.d. 6 million rupiah per family

In addition to the capacity of 10 families, this fabricated biofilter processing unit has been developed for processing capacities up to 200 – 400 families.

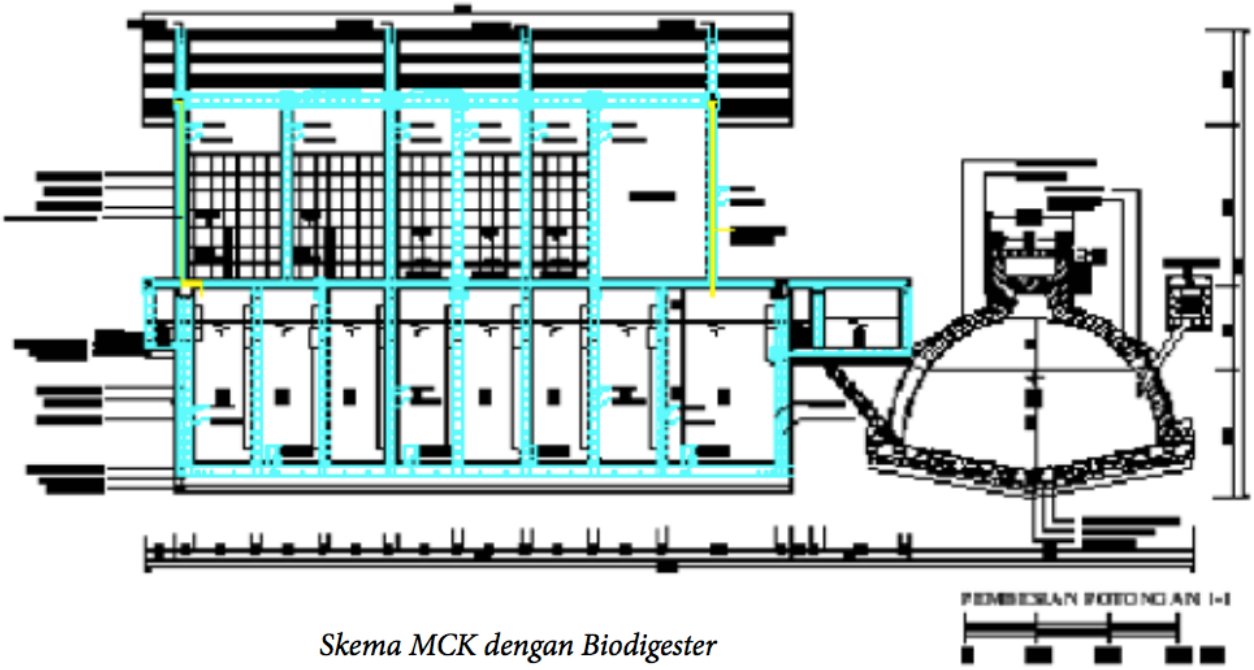
MCK Facility scale

Covering services for the scope of 10 to 100 households. MCK is suitable for areas where most of the community does not have their own latrine, the community is willing and interested in managing the MCK, and the minimum number of potential users is around 50 families so that the investment cost per family is not too large. The number of rooms for a MCK building based on the type of household capacity is as follows:

Tipe	Banyaknya Ruangan		Cuci (Titik Keran)
	Mandi & Kakus		
	Pria	Wanita	
Tipe I 50 KK	2	1	4
Tipe II 100 KK	6	4	6

The MCK component consists of the upper building and the lower building. The superstructure consists of:

- Toilet cubicle (chamber for bathing, washing and defecation or toilet).
- The shower cubicle is equipped with a bath or shower for water saving.
- The latrine is equipped with a bucket and a dipper, to save water.



Skema MCK dengan Biodigester

The lower building for wastewater treatment (black water and gray water) can be in the form of:

- Conventional Septic Tank
- Anaerobic Baffled Reactor (ABR)
- Infiltration unit.

Other equipment for an MCK include:

- Sources of clean water (including water storage tanks or roof tanks)
- Complementary utilities such as electricity (lighting & water pump), drainage
- Additional processing to capture gas from blackwater is a biodigester. The gas can be used for cooking, lighting in MCK and for providing hot water in MCK.

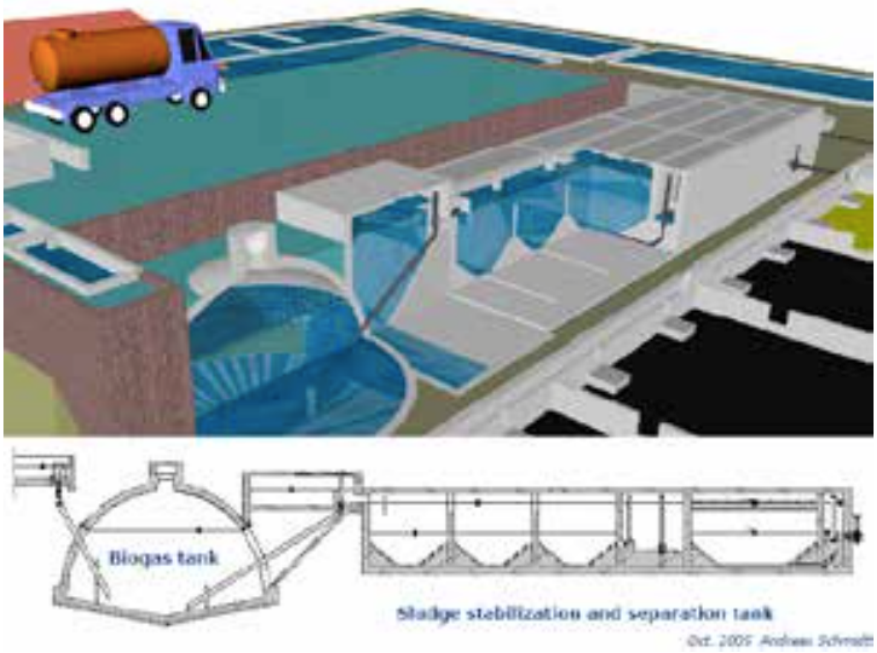
Investment cost per household for MCK with biodigester is between 5 s.d. 7 million

Sludge Treatment Plant

Biological wastewater treatment in both aerobic and anaerobic conditions will produce sludge. The treatment commonly used in local systems is anaerobic treatment where the sludge produced is relatively less than the sludge produced under aerobic conditions. The anaerobic treatment unit used is generally designed to have a slurry chamber that will be full within 2 s.d. 5 years and need to be vacuumed. The resulting sludge needs to be further processed to make it more stable and safe from polluting the environment. Therefore, IPLT is needed as the final treatment of fecal sludge.

The main components that are generally present in IPLT:

- Collecting unit (equalization basin)
- Filtering unit (eg bar screen)
- Discrete particle separation and concentration unit (eg Imhoff Tank/ solid separation chamber)
- Stabilization unit (eg. anaerobic pond)
- Liquid treatment unit (eg. facultative dan maturation pond)
- Sludge dewatering unit (eg. sludge drying bed, filter press)



IPLT dengan Anaerob Dlgester

IPLT operation supporting components:

- Dumping stations
- Management office
- Equipment storage warehouse
- Laboratory for monitoring IPLT performance.
- Road infrastructure in the form of driveways, operational and inspection roads, etc.
- Monitoring wells to monitor groundwater quality around the IPLT
- Clean water facilities
- Guardrail
- Generator (backup power source)

The investment costs for a complete set of IPLT are quite variable. For the same discharge and the same system, differences will occur due to differences in the geographical and geological conditions of the IPLT location. It can be estimated that for a WWTP with a processing capacity of 30m3/day, an investment cost of 3 s.d. 5 billion rupiah (excluding land acquisition costs)

Sludge Collection and Transport Vehicles

To support the sustainability of the local system that has been built and also to maintain the input of sewage into the IPLT, adequate desludging and transporting fleets of sewage are needed. There are often cases where the IPLT cannot run optimally due to the lack of sewage supply due to the minimal number of desludging vehicles owned by the district/city government as the IPLT manager.

Generally, the sewage sludge is sucked up and transported by trucks with a tank volume of between 2 and d. 4 m3. This truck is also equipped with a suction pump, and incharge and discharge hoses.

As an alternative, for areas that are difficult to reach by truck due to the narrow access road, the presence of a motorbike or stroller or desludging cart is a practical solution.

The investment cost for desludging trucks is around 250 to 400 million rupiahs per unit and for motorbikes/carts/pushers for desludging it costs less than 100 million rupiahs

5.1.2.2 Centralized Wastewater Treatment System (Off-Site)

Centralized Wastewater Management System or known as off-site system or sewerage system, is a unified physical and non-physical system of residential wastewater infrastructure and facilities in the form of service units from house connections, waste water collection units through piping networks as well as processing units and final disposal that serves the scale of certain areas, settlements, and cities.

Advantages	Deficiency
• Provide the best service • Suitable for high density areas • Pollution of ground water and water bodies can be avoided	• Requires high investment, operation and maintenance costs • Using high technology • Cannot be done by individuals

• Has a longer service life • Can accommodate all wastewater (greywater and blackwater)	• Long time in planning and implementation

Centralized Wastewater Management System can be divided into several groups, namely:

- **Urban Scale**, whose service coverage covers one city (across sub-districts within one city) or regionally. This city-scale wastewater treatment has a complete system from house connections, control tanks, main pipes to service pipes, pump houses, and wastewater treatment plants equipped with sludge treatment.
- **Settlement scale**, which covers a residential area with a number of families served by more than 10 families (generally above 100 families but not more than 2,000 households and served by one wastewater treatment unit). Residential scale wastewater treatment is usually designed to avoid the need for pumping to save on operational and maintenance costs. This residential-scale WWTP is also not equipped with sludge treatment so that it still requires periodic desludging of sludge for further processing at the IPLT.
- **Specific Area Scale**, covering services for the scope of certain commercial areas and/or buildings such as flats, hotels, shops, shopping centers, and offices.

The investment cost for the settlement scale is around 6 to 10 million rupiah per family (not including the provision of WWTP land). Meanwhile, for the city scale, the investment costs reach around 12 to 15 million rupiah per family and can increase drastically if the construction requires special methods such as pipe jacking or shield tunneling

The wastewater treatment plant system is centered on a combination of several treatment units as follows:

Physical Processing as preliminary processing:

- Loose material filter (bar screen)
- Sand separator (grit chamber)
- Settling tank (primary sedimentation)
- Advanced settling basin (clarifier)
- Ultrafiltration
- Reverse osmosis

Chemical Processing as additional processing if needed:

- Chlorination as a disinfectant
- Ozonization

Biological Treatment as the main treatment, commonly used:

- Anaerobic + facultative + maturation pond
- Upflow Anaerobic Sludge Blanket (UASB)
- Aeration Pool
- Anaerobic Baffled Bioreactor (ABR)
- Trickling Filter
- Rotating Biological Contactor (RBC)
- Activated sludge
- Extended Aeration
- Oxidation Ditch
- Phytoremediation (wetland)

5.2 Educational and Behavior Change Activities

This section provides suggestions for educational and behavior change activities to support the sustainable adoption of appropriate hygiene practices by employees. While it focuses on how companies can improve sanitation and hygiene behaviors through education at their own premises, the same principles can be transferred both downstream to employees and their communities and upstream to suppliers.

Providing comprehensive educational and behavior change training to employees can help ensure that workers:

- Are aware of the importance of water quality and its relation to health, both at work and at home, and the need for safe water supplies.
- Accept the need for a proactive response when someone does not follow standards.
- Understand their role in the surveillance process.

- Have the necessary skills to perform this role.

5.2.1 Changing Behaviors with Effective Education Campaigns

An effective health education campaign has the following essential characteristics for achieving long lasting behavioral change:

- Promotes actions that are realistic and feasible within the constraints faced by workers.
- Builds on ideas and concepts that people already have, in addition to common cultural practices.
- Is repeated and reinforced over time using different methods.
- Uses existing channels of communication.
- Attracts the workers' attention.
- Uses clear, simple language and local expressions, and emphasizes the short-term benefits of action.
- Provides opportunities for dialogue and discussion to facilitate learner participation and feedback.
- Uses demonstrations to show the benefits of adopting the recommended practices and allows participants to practice and participate in learning sessions.

5.2.2 Key WASH Topics to Educate and Change Behavior

There are three major hygiene behaviors that need to be engrained in employees to ensure a sustainable WASH program:

- **Protection of drinking water supplies**: Ensuring water supply that is free of fecal contaminants and water-related diseases is essential to maintaining health. Preventing source water contamination is often easier and less costly than treating contaminated water. Therefore, it is necessary to change behaviors that lead to potential contamination of primary drinking water sources (such as open defecation, open wastewater disposal, improper industrial waste disposal), to treat water in the home when it is suspected of being contaminated, and to use clean water containers for water distribution and drinking.
- **Use of latrines**: All employees should use the provided toilet facilities and any contrary behavior needs to be addressed.
- **Hand washing**: Proper hand washing practices is an effective way to stop the spread of infection. The poster shown in **Figure 3** can be used to promote proper hand washing technique.

Additionally, workplaces are encouraged to educate workers on other areas critical to WASH in the workplace including:

- Water conservation
- Menstrual hygiene
- Safely managed sanitation (fecal sludge management), particularly for workers involved in maintaining sanitation facilities.
- Safety education related to handling hazardous material, managing worker exposure to hazards including adequate cleaning facilities for workers exposed to hazardous waste.
- Water conservation and water pollution prevention awareness

5.2.3 Hand Hygiene Protocol for the Workplace

In the context of COVID-19, it has become clear that handwashing is a first line of defence for mitigating the potential impacts of COVID-19 in the workplace. Workplaces are often where large numbers of people congregate in close quarters therefore handwashing with soap plays a critical role in combination with other key behaviours (mask wearing, physical distancing) to prevent the spread of COVID-19.

Access to improved water, sanitation and handwashing facilities offers opportunity to use those facilities but these must go together with a robust behaviour change programme to ensure sustained use and for lasting change such as improved health. Hygiene behaviour is crucial but one of the most difficult things to change without robust programming. The following key elements (based upon ILO guidance) outline the minimum hand hygiene elements that should be in place for the workplace and should be integrated into existing standards and certification.

<u>Access</u>

- Providing adequate access to handwashing facilities, with soap and water, at key locations or touchpoints are important throughout the workplace. One or several hand hygiene stations should be at the entrance of workplace site, to allow everyone to practice hand hygiene before entering and leaving it.
- The required number of handwashing facilities will depend on the setup of the workplace, e.g. number of people entering the facilities per hour during peak times; number of people going on lunch break at the same time, ratio of female-male workers etc. The facilities should also be based upon the type (children, elderly, those with limited mobility) of users. These facilities need to be available in all key locations of the workplace with continuous provision of soap and water.

<u>Facilities</u>

Handwashing facilities should include:

- Washing basins accessible for people with disabilities and can be in various shapes or sizes to facilitate multiple users. The basins should be attached to potable running water and should have a drainage system for waste water. According to local authority regulations, considerations should also be made for handwashing stations to allow physical distancing of at least 1-2 meters.

- Potable running water that is safe to drink is preferable, however, water that is safe for drinking is not necessary for handwashing. The water temperature does not influence effectiveness, but it might contribute to comfort and therefore encourage handwashing behaviours. When piped running water is not available other methods can be used e.g. hanging container.
- A handwashing facility with water and soap is good practice and single-use hand towels or dryers should be available. If not available air drying should be promoted. If this is not possible, an Alcohol-based hand rub (ABHR), containing at least 60% alcohol, facility/dispenser should be made available. ABHR on wet hands is significantly less effective and should not be used as substitute for handwashing.

Good Hygiene Practice

- Good practice guidance on handwashing practices should be followed – cues / prompts could be provided. Each handwash should last at least 20 seconds (scrubbing hands with soap and water for 20 seconds).
- The provision of hardware at the workplace as well as embedding hygiene behaviour change amongst the workers, which should be encouraged by management, will help ensure sustained improvements in workplace hand hygiene. The integration of hygiene behaviour change session using attractive and fun activities directly link with people's emotions to practice key behaviours is necessary. The provision of visual cues, nudges and reminders around the workplace to prompt behaviours alongside simple effective attractive information will help reinforce social norms and changes in behaviours. Behaviour change promotion should focus on key behaviours including handwashing with soap.

Companies should be responsible for ensuring compliance with the guidance and should also be responsible for hygiene behaviour change promotional programme around the importance of hand hygiene in the workplace. Government, development agencies and NGOs has resources to support businesses in delivering this behavior change campaign to employees and communities.

VI. BENEFITS FOR COMPANIES INVESTING IN WASH

6.1 Business Contribution to WASH

Companies can make direct improvements to productivity and employee morale, as well as public health and wellbeing, by providing and maintaining safe drinking water, appropriate sanitation and hygiene facilities, combined with education and awareness-building activities. The latter can also provide the impetus for improvements in the larger community and thus make an impact on a much broader scale.

Reasons for businesses to invest in Water, Sanitation and Hygiene (WASH) in the workplace are:

- Positive impact on the business model and bottom line;
- Wide ranging economic benefits;
- Direct contribution to the achievement of the Sustainable Development Goals 2015-2030.

6.1.1 Positive Impact on the Business Model

Increasing productivity and reducing absenteeism

Health indices and access to safe WASH are related. An investment into WASH services in the workplace can generate public benefits as well as be valuable to business as it creates opportunities for growth and profitability. Healthy workers have less absenteeism and are likely to be more productive and have lower workplace error rates. An investment into WASH services in the workplace can be valuable to business as it creates opportunities for growth and profitability. Attrition rate can drop which will lead to an increase in employee retention, the general wellbeing of the workplace to increase and higher levels of worker satisfaction. Some case studies show that:

- Lower absenteeism leads to high productivity given a more capable workforce and lower factory error rates. Through the HERproject, Levis Strauss provided women at factories with health education and improvement of on-site health services and behaviour. Absenteeism fell by 55% and staff turnover has dropped from 50% to 12%. One factory calculated a $4:$1 return on investment (ROI).
- Returns in performance by the 300 factory workers of Confection et Emballages in Haiti largely compensated the modest cost of installing seven water coolers, because it significantly increased the level of attention and efficiency at work (Di Martino et al. 2003).
- Studies covering 27 African countries found that “increasing the access rate to drinking water significantly increases the growth rate of agricultural labor productivity” because of the better health of workers and less time they spend on fetching water. (Kiendrebeogo, 2012).
- In Vietnam, some factories did better when they went beyond merely avoiding conditions associated with sweatshops and instead created an environmentally

comfortable and trusting workplace, including water and restroom satisfaction. Profitability was 7.6% higher where workers expressed greater satisfaction with water, air quality, restrooms, canteens and health services provided in the factory, holding other factors constant (ILO 2015c, Brown et al. 2015). These measures help workers recover energy during long working days, increases productivity, and decreases fatigue, work-related illnesses, and absenteeism.

- Inclusion of menstrual hygiene management can help women stay in work and ensure gender equality in the workplace. In Kendougou, Senegal, 96% of the women surveyed said they did not regularly go to work while they were menstruating.
- Many of the plenary discussions for ILO Conventions highlighted the importance of WASH-related provisions as a means to increase productivity by reducing vector-borne diseases. For example, the Hygiene (Commerce and Offices) Convention, 1964 (No. 120), and the Safety and Health in Agriculture Convention, 2001 (No. 184).

Reducing operational costs and business risks

Given that poor water stewardship management and WASH management could force the closure or relocation of business operations, investing in this area can increase investor confidence and protect the company share price. For example, improving access to sanitation will reduce water treatment costs. Lack of sanitation can lead to higher on-site pre-treatment costs in making contaminated water usable for industrial use, or worse, water supplies so polluted that they are not available for industrial use. Some studies also show that:

- Of those companies that publicly responded to the 2016 CDP water questionnaire, 65% believed that they were exposed to water risks that could generate a substantive change in their business, operations, revenue or expenditures. WaterAid found only 15% reported WASH-related risks in direct operations and 7% in supply chains.
- Diarrheal diseases were the 4th largest source of hospital admissions and 10th largest cause of death at Newmont Mining, Ghana. In response to this, investment into their sanitation systems led to a 30-40% reduction in the incidence of diarrhoea and the avoidance of $28,000 in medical costs per year in one mining community.

Developing supply chains and supply security

Investment in WASH facilities across the business supply chain provides the opportunity to increase workforce productivity and grows supply security of the product. Cost savings across the supply chain are of benefit to both producers and consumers which will in turn increase economic efficiency. Further, an investment into WASH in the supply chain represents an investment into market security and will ultimately provide a more enhanced supply side infrastructure. Through their Water of Life Programme, Diageo has worked to support water supply, sanitation and hygiene projects in 58 communities in Ghana, some of which input to their subsidiary breweries' supply chain. In addition to the positive social impact generated, Diageo is looking to better understand and capitalise on the potential

strategic and sustainable impacts for its business.

Strengthening social licence to operate and addressing reputational risk. The implementation of WASH facilities in the workplace provides further opportunity for the business beyond its walls. As many businesses are often within close range of Low Income Communities, there are significant opportunities to invest in providing better WASH services in the surrounding area. This mechanism strengthens a company's social capital via a stronger connection with the local community. This work can lead to enrichment of brand loyalty and goodwill towards the company: "Being a responsible water user is an opportunity for us – it helps build stronger relationships with local communities and governments and enhances our social license to operate: being responsible makes it easier for us to do business" Anglo American, UK(2015). Good water management, provision of WASH and meeting companies' responsibility to respect the Human Riaght to Water and Sanitation (HRWS) ensures companies' social license to operate, reduces reputational risk and can strengthen relationships with governments and other key influencers.

6.1.2 Wide Ranging Economic Benefits

There is a considerable range of economic benefits that follow from investment in WASH provision. For low income countries, improved WASH and economic growth go hand in hand and contribute to unlocking communities from poverty and support the discovery of economic potential. Some evidence suggests that:

- The recovery of lost economic potential is significant. A World Bank Study estimates that in 2008, the economic loss of poor WASH to Indonesia and the Philippines was $3.3bn and $1bn, respectively.
- Inadequate WASH is associated with global economic losses of USD 260 billion every year, largely due to lost time and productivity. WHO (2012)
- The reduction of disease and the increase in general health levels brings a stronger and more productive workforce. Every day, on average, over 800 children under 5 years of age die from diarrhoeal diseases due to poor WASH.
- Time saved in fetching water, especially for children and women, leads to more opportunities for primary and secondary education which in itself is essential for individuals to have an opportunity to increase their standard of living. "Nestlé repaired the pumps in Bonicro and constructed latrines and water stands for our schools. With the repairs, women who used to have to walk many kilometres to get water now save a lot of time and can get clean water" (beneficiary of Nestlé and IFRC intervention in Cote d'Ivoire).

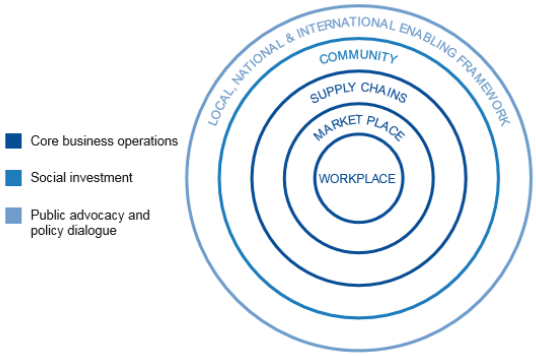
Investment in household or communal WASH facilities will lead to an improvement in housing conditions and an increase in the value of property. These benefits will primarily be experienced in urban areas and can contribute to the development and prosperity of cities. Rural areas across a nation can also receive benefit from WASH improvements in urban settings. As workers migrate towards buoyant urban labour markets, they in turn begin to produce a flow of remittances back to family members in rural settings. In Sub-Saharan Africa and Asia, the volume of internal remittances is consistently greater than

international remittances and the majority of beneficiaries of these internal remittances are poor households.

With the increase in economic production from a healthier and more educated workforce, GDP will rise which will lead to a higher levels of income per capita and economic growth. Inward investors will notice the growing opportunities to establish business operations within their country, given the improvements in the WASH infrastructure. Capital inflows are not only positive for employment opportunities, but also positively affect the balance of payments.

6.1.3 Direct Contribution to the Achievement of the Sustainable Development Goals (SDG) 2015-2030

SDG 6 – ensure availability and sustainable management of water and sanitation for all, is pivotal to achieving other goals such as SDG1, 2, 3, 4, 5, 8,10, and 11. Businesses can best contribute to SDG6 through:



- **Core business operations** (at workplace, market place, and supply chains) can be monitored and developed to ensure: safe workplace WASH, efficient water usage/recycling, correct watershed management, training staff in behaviour change and disseminating learning across the supply chains.
- **Social investment** (at community) by contributing knowledge capital and finance to support WASH development and access to affordable WASH products in communities local to the business.
- Business can use **public advocacy and dialogue** (using local, national, and international enabling framework) to elevate the priority of WASH in policy formation and implementation, to lobby for better governance in the sector and act as a vehicle to facilitate learning across the sector.

6.2 Maximizing the Impact of WASH Interventions by Business

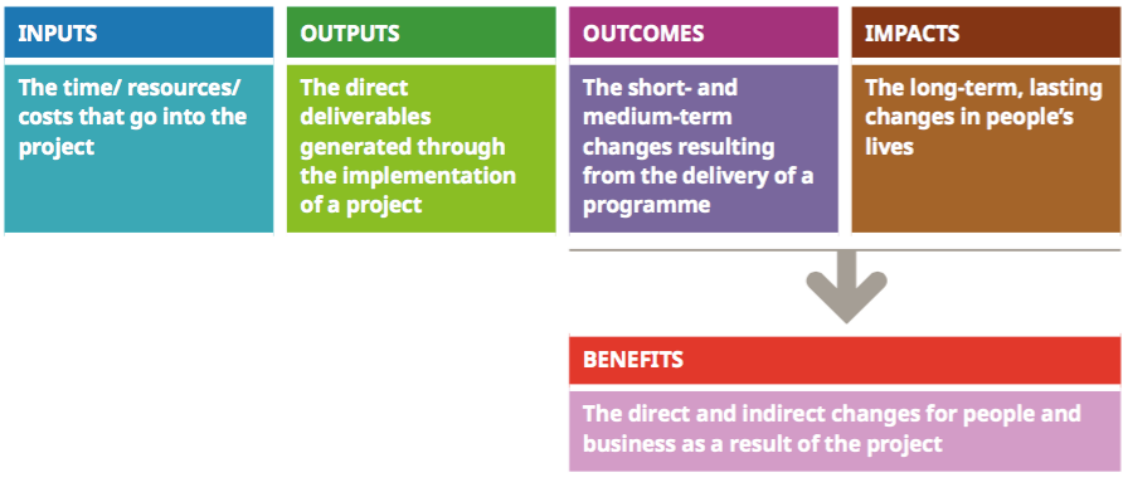
Research suggests that few companies have a clear idea of how WASH investments might translate into financial benefits – especially investments in supply chains. There is some anecdotal evidence, although this underlines that a financial return on investment

is not the only driver. Non-financial intangible returns are important, including alignment with business values, expectations of customers and business customers, compliance with national and local legislation, and mitigating the risk of disease outbreaks. Companies need support, both to identify good-practice WASH interventions in the wide range of contexts where they operate (particularly where supply chains are long) and to understand standards and costs. This might include guidance on minimum service levels (accessibility, quantity and quality) for different workers (e.g. male and female) in different contexts (e.g. farms, factories and households/communities).

6.2.1 Impact Pathways

The company's WASH interventions are expected to benefit society, the community and the environment, and as a result, businesses operating in this context. However, it is possible that not all changes from WASH intervention by companies will have a positive impact. To ensure this, companies need to design efforts to improve WASH by also estimating what the ultimate benefits of various WASH improvement activities will be. After the company designs the WASH intervention that will be carried out based on the identification of needs, the next step is to map the potential changes that may occur.

These can be mapped using 'impact pathways' (*WaterAid, Strengthening the business case for water, sanitation and hygiene, How to measure value for your business*), which identify inputs, outputs, and outcomes and their expected impacts on people, communities and businesses. WaterAid defines 'outcomes' as short and medium term changes resulting from program implementation, and 'impacts' as long term and lasting changes in people's lives. For simplicity, results and impacts are here combined into 'benefits' (see diagram below), although it is also possible to distinguish between outcomes and impacts in the company's designed impact path.



Inputs are all resources and activities carried out by the company to improve WASH access which are designed according to needs based on the identification process. Some examples of inputs are:

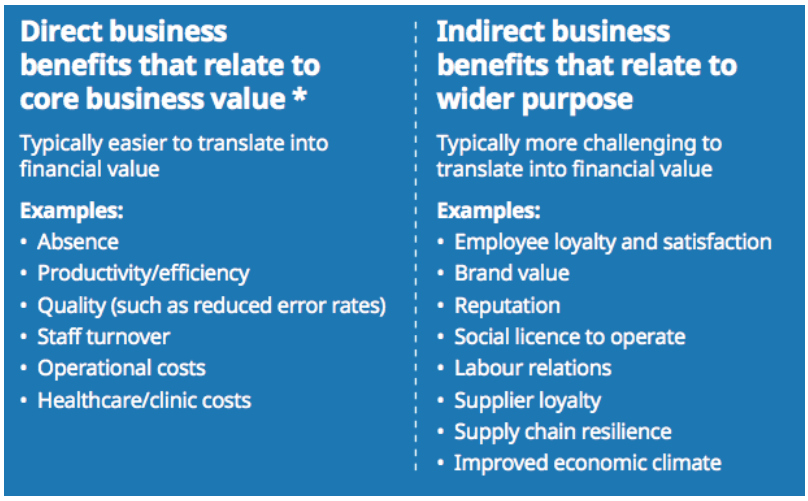
- Construction costs of latrines, drinking water installation, waste water treatment plan, hand washing stations, etc.

- Behavior change communication/campaign
- Maintenance costs over time
- Staff time costs

Activities as inputs are expected to produce outputs in the field that will bring benefits as expected. Some examples of outputs from WASH interventions by companies are:

- 100 toilets are built in communities and the workplace
- WASH champions within workplace
- 200 people trained on handwashing practices

Within business benefits, there are two categories: **direct business benefits** that relate to core value and **indirect business benefits** that relate to wider purpose.



Benefits can also be categorised by the people or group impacted on:

- **Benefits to people** (including employees and people in the community). These may include physical, emotional and wellbeing changes, such as improved sense of dignity, lower incidence of waterborne diseases, decrease in school absence rates, improved knowledge of hygiene practices, and less time taken to fetch water.
- **Benefits to supplier**. These may include direct cost reductions, reduced staff absence, reduced staff turnover, improved staff productivity, lower workplace clinic costs, and improved reputation.
- **Benefits in supply chain**. This includes benefits that are shared by both the supplier and the company, and may include better relations, increased efficiency, and greater resilience to sudden changes (e.g. disease outbreak, flooding).
- **Benefits to the company**. These may include better reputation, improved stakeholder relations, and reduced input costs. Some of these are less tangible wider benefits, which nonetheless can translate into improved bottom line.

6.2.2 Financial Benefits to Business

Finally, the impact pathway identifies the financial benefits to business, which are a consequence of the supplier, supply chain and company benefits. It is these financial benefits that generate a financial ROI.

Benefits are not distinct and may flow into each other. For example, benefits to people and communities, such as improved health, will likely result in benefits to supplier companies operating in the area, such as reduced staff absence. To create the impact pathway, companies should consult internally and with partner organisations, experts in the field, and those 'on the ground'. This will enable companies to better understand the cause and effect relationships between inputs, outputs and expected benefits, and may also help the companies get stakeholder buy-in.

To design methods to quantify (and monetise) these benefits, an in-depth understanding of the business was needed. An example of business benefits and related indicators can be seen in the table below.

Benefit	Indicators
Absence	Number of absent days per worker per year Total number of workers Cost per day of an absent worker
Productivity	Weight of tea picked per worker per day in peak season Weight of tea picked per worker per day in off-peak season Sale value per kg of tea Average price paid per worker per kg of tea picked
Clinic costs	Total health clinic costs for treating vomiting, diarrhoea and associated dehydration
Social benefits (non-monetised)	Biannual surveys to assess: • Knowledge and awareness of sanitation and hygiene • Sense of safety and dignity • Time taken to fetch water • Levels of worker satisfaction

6.2.3 Measuring the Social Benefits

WASH interventions aim to deliver social benefits. Companies may also wish to quantify and value the societal benefits. An understanding of these impacts can help the companies design WASH interventions with maximum benefits to society and communicate about their contributions to the SDGs. Furthermore, these societal benefits can also contribute to a thriving economy, which is in turn beneficial for business.

Societal benefits may include:

- Improved health and wellbeing of individuals
- Greater sense of safety and dignity

- Lower healthcare expenditure for governments

Case Study

A leading UK-based clothing retailer has a selection of its garments manufactured in factories in Bangladesh. In 2015, it partnered with a pharmaceutical company and an NGO to fund and implement a health and social care programme with sanitation and hygiene elements in two of its supplier factories. As well as improving the health of workers, one of the aims of the programme was to identify the financial value of healthcare interventions to the factories, to strengthen the case for the participation of other suppliers.

A consultancy was hired to undertake this research and identified four indicators that would give a measure of the value gained from the health programme. These indicators were:

- Staff absence
- Staff productivity
- Quality (number of amended or rejected garments)
- Employee turnover

Before starting, a thorough understanding of the factories' operations was gained, and data was collected for one year before the start of the programme to establish a baseline period for comparison. However, it wasn't possible to conduct an attribution study during the programme.

Factory A experienced a 15% increase in worker efficiency, which led to a higher rate of garment production, and Factory B collected savings of approximately £180,000 from lower staff turnover, lower staff absence and a reduction in errors made to garments. The company is now rolling this programme out to other factories, and is also commissioning an attribution study to enable it to calculate a robust ROI.

VII. COMPANY EFFORTS TO INCREASE WASH ACCESS AT THE WORKPLACE - SOME DOABLE ACTIONS

7.1 Process for Companies to Implement WASH at Workplace

This section outlines a suggested process for companies to follow in providing safe water, sanitation and hygiene in premises under their direct control. Steps to implement WASH at the workplace are:

Step 1: Establish baseline conditions in countries of operation
Step 2: Perform self-assessment
Step 3: Prioritize gaps
Step 4: Develop and implement improvement plan
Step 5: Disclosure and communication

Step 1: Establish baseline conditions in workplaces

The first step in the WASH implementation process should be determining the current state of access to WASH within the company's countries of operation. The following resources can assist this process, and provide other data on water use and stress:

1. Progress on Drinking Water, Sanitation and Hygiene, Joint Monitoring Programme 2017 update and SDG baselines
2. Bappenas data on national sanitation access and/or STBM data of Ministry of Health
3. Conduct ad-hoc survey to determine WASH access to targeted communities

Step 2: Perform self-assessment

Self-assessment of WASH access in the workplace is a process to understand the current status of WASH provisions provided in places under the direct control of the company. This process will assist companies in identifying gaps in WASH access compared to WASH leading practice. The self-assessment tool can also be used as a checklist to understand WASH practices in any workplace under the direct control of the company. This instrument is a point of reference regarding WASH conditions in the workplace compared to given government regulations and standards, and can be used to evaluate the performance of any facility or work area.

Step 3: Prioritize gaps

The self-assessment tool's output is a gap assessment that provides insights on areas that should be addressed immediately (0–2 years), in the medium-term (3–5 years) and over the long-term (>5 years) to improve WASH performance within operations and across the value chain. Prioritize the gaps by referencing the following dimensions:

- Difference between company performance, and leading practices.

- Severity of risks associated with inaction.
- Ease of achieving improvements.

Step 4: Develop and implement improvement plan

After the gaps have been prioritized, use a decision tree to develop an action plan to address them. The decision tree should focus first on compliance with local and national laws and regulations related to WASH practices. However, companies are encouraged to go beyond compliance by developing internal practices that could be considered best practices. Once the improvement plan has been developed, companies can focus on implementation to address gaps across all premises under direct company control. To help ensure the long-term success of WASH programs, the actions outlined in these improvement plans should be integrated into existing company policies and procedures so that WASH becomes an integral part of company operations.

Step 5: Monitoring, disclosure and communication

To ensure best practices are sustained, regular audits, performed annually or at a frequency determined by the company, should be used to monitor performance. It is recommended that companies disclose progress made in implementing access to safe WASH at premises under their direct control at least annually, to employees, and in public reporting and communications. It is also critical that monitoring is conducted at the corporate level to measure progress and validate the business case for WASH. Disclosure and communication demonstrate commitment and give companies a platform to showcase the benefits of increased access to safe WASH. Such disclosures can also give companies legitimacy to call for improvements in surrounding communities.

7.2 WASH4Work Self-Assessment: Mapping Conditions of Workers Access to WASH at Workplace

The self-assessment tool can be used by companies to evaluate the implementation of access to safe WASH at the workplace in comparison to stadards and regulations. It can help identify areas for improvement, and support decision-making regarding investment and priority action. Once completed, it provides an overall rating for each of the categories below as well as an overall rating for the assessed facility or workplace location.

The instruments were developed by adapting existing WASH4Work assessment and monitoring frameworks such as **UNICEF WASH4Work: Baseline and Monitoring Indicators and WBCSD WASH Pledge: Guiding principles**. This framework is meant to provide a more comprehensive set of indicators and guidance for stakeholders including businesses and governments to assess and monitor WASH conditions in the workplace and communities where workers live. It provides Outcome Focus Areas and associated Indicator Areas across four dimensions:

1. Business Commitment to WASH
2. Awareness of WASH among Management and Employees
3. Access to and Use of Improved WASH Facilities at Worksite Facility / Locations

4. Companies Awareness to Climate Change, Social Responsibility Program and Disaster Emergency Response

The framework includes indicators that focus on WASH conditions in the workplace and workers' households and/or surrounding communities. This recognizes that WASH conditions in workers' homes, and in the communities in which businesses are located, are inextricably linked to the health and safety of workers, their families and communities. This framework also provides a menu of indicators that can be incorporated into self assessment/survey for various respondents (e.g. management, OSH division, workers, etc.).

The structure of the self-assessment tool is aligned with the WASH at the workplace points of reference. It includes a broad range of indicators for workplace settings, with core indicators to provide a basic overview of all WASH conditions. Once completed, it provides an overall rating for each of the categories below as well as an overall rating for the assessed facility or workplace location. **The instrument can be find at the attachment of this document.**

In principle, this survey is a self-assessment conducted by the company as part of the monitoring mechanism for improving workers' access to WASH in the workplace. The P2K3 committee or Occupational Safety and Health (OSH) – Work Environment personnel in the company have an important role in the quality of the data collected. If there is more than one location within the workplace, it is recommended that questions specific to the availability of WASH facilities be completed for each worksite location. For example, depending on the size of the facility, such as large factories, data on sanitation or handwashing facilities may need to be collected by factory floor or among the different worksites/fields operated by the business.

7.2.1 WASH4Work Points of Reference for Self-Assessment

This section covers points of reference for best practices in providing WASH in workplaces. These points provide the background to each of the questions that a company should address in its self-assessment.

7.2.1.1 Business commitment to WASH

In this section, the assessment aims to find out whether the business has made a commitment to improve WASH conditions and is able to demonstrate an understanding of the business benefits of promoting WASH in the workplace, among its workers and in the surrounding community.

<u>Compliance with local and national laws and regulations</u>

All workplace facilities and premises under direct company control must comply with existing local and national laws and regulations. Where laws and regulations do not exist to govern a specific point of reference, the company should develop internal guidance that

meets or exceeds the laws and regulations of the most stringent country in which it operates, and/or applicable international standards.

Policies and procedures

WASH provisions sufficient for the prevention of public health risks and in compliance with local and national laws and regulations must be in place for all work sites including production facilities, offices, creches, canteens, kitchens or health clinics that are used by workers at places of work.

Policies for company's supply chain workplaces

WASH provisions should also be included in contracts for third parties and contractors. Policies are in place that outline expectations for water, sanitation and hygiene in sites that are part of the value and supply chain. If companies have WASH policies in place for their supply/value chain businesses, they also must have a strategy in place to implement improvements. Companies should promote WASH self-monitoring among their supply chain, to measure change and progress towards identified expectations.

WASH monitoring mechanisms

Facilities should have adequate mechanisms in place to monitor and assess the functionality of WASH systems, per regulations and standards. Ideally businesses should have data on baseline conditions such as on provisions responding to the WASH needs of women and those with disabilities, to ensure that the adequacy of facilities for all workers can be tracked.

Mechanism to measure impact

Businesses should have procedures in place to measure the impact of the WASH improvement in facilities on workers and business. How businesses do this can vary based on their capacity, partnerships, available data and resources.

7.2.1.2 Awareness of WASH among Management and Employees

As part of efforts to improve WASH in the workplace, it is also important for companies to find out if they have made commitments to increase WASH knowledge of management, workers, and surrounding communities, and to promote behavior change.

Measures undertaken to increase WASH knowledge and promote behavior change among workers

Regular training, awareness-building activities and behavior change processes should be implemented for all workers. Hygiene training should be given to all new employees. Awareness-raising activities should be conducted during occurrences such as disease outbreaks and changing environmental conditions (e.g., flooding) that could affect worker

health. Topics of importance include safe drinking water, sanitation, proper handwashing practices, and menstrual hygiene management for female workers.

Measures undertaken to increase WASH knowledge and to promote behavior change among targeted community

Businesses are also encouraged to have knowledge about WASH conditions in the surrounding community. This is done by assessing and addressing WASH conditions where their workers live and/or in the communities surrounding their workplaces. This approach can be initiated by conducting at least one of three levels of assessment:

- Level 1 – collection of community household secondary WASH data from reports
- Level 2 – collection of community household secondary WASH data directly from government and community organizations
- Level 3 – collection of community household primary WASH data directly from households in the community, or from workers on their home access to WASH

Following an assessment, the company should develop and implement a plan of action to address its findings. The extent to which the findings are addressed is up to the workplace and should ideally be done in consultation with community members and workers, and with government and other partners with WASH expertise. The company should then establish a system to monitor its implementation efforts.

7.2.1.3 Access to and Use of Improved WASH Facilities at Worksite Facility/ Locations

In this section, the focus of the assessment is on the company's efforts to provide access to adequate and improved WASH facilities in the workplace. In addition to the international standards described in the framework document guide (**UNICEF WASH4Work: Baseline and Monitoring Indicators and WBCSD WASH Pledge: Guiding principles**), the following two ministerial regulations are guidelines for WASH standards in the workplace as a reference for companies in Indonesia:

- Regulation of The Minister of Health of The Republic of Indonesia, Number 70, Year 2016 Concerning Standards and Requirements For Industrial Working Environmental Health
- Regulation of the Minister of Manpower of the Republic of Indonesia, Number 5, Year 2018 Concerning Occupational Health and Safety in the Work Environment

Drinking Water at Workplace

Availability of sufficient, free, physically accessible drinking water

Sufficient and physically accessible drinking water must be provided to all employees, including those with disabilities, at the workplace. Water should always be available at a convenient distance for employees and available to provide for all drinking, sanitation and hygiene needs. Water should be free of charge for employee use at the workplace. Employers that allow employees to take water home for domestic use may charge an

affordable price.

According to Regulation of The Minister of Health of The Republic of Indonesia No. 70/2016, adequate drinking water for the work environment industry is calculated based on the type of work and the length of hours each worker worked for each day. The quality standard (SBM) of 5 liters/person/day generally applies to every worker. If the type of work requires more drinking water, then the needs are adjusted to the type of work.

Access to safe water that meets quality standards

Drinking water from an improved water source should be available to all workers, and water quality should be sufficient to prevent public health risk, per government standards. If a raw water source does not meet standards it should be treated before being consumed by workers. Water taste should be palatable, or acceptable, to workers to encourage them to rehydrate as needed. Safe method(s) for the provision of drinking water (clean water fountains, vessels or coolers) should be in place for all workers to use. Drinking water should be taken from the storage vessel or source in such a way that hands, cups or other objects cannot contaminate the water. Improvements that make the water supply safe, more convenient, and reliable, such as the provision of a regulated water supply through a workplace connection, are strongly encouraged.

The Ministry of Health regulation also stipulates that the quality standards of health drinking water include physical, biological, chemical and radioactivity qualities. Mandatory parameters must be checked periodically in accordance with applicable regulations, while additional parameters are parameters that must be checked only for areas that show the presence of chemical contamination associated with these additional chemical parameters.

Sanitation at Workplace

Access to adequate toilet facilities

The company ensures that all workers, regardless of work location (e.g., office, factory, and other outdoor settings) have access to adequate toilet facilities such as a flush or pour-flush toilets, septic tank, pit latrine and ventilated improved pit-latrine. An appropriate number of properly constructed toilets and urinals must be provided at a rate of two toilet seats and two urinal facilities per 45 male workers, and four toilet seats per 50 female workers (**WBCSD WASH Pledge: Guiding principles**). Local regulation in Indonesia could also be used. According to The Regulation of The Minister of Health of The Republic of Indonesia, Number 70, Year 2016 Concerning Standards and Requirements For Industrial Working Environmental Health, the quality standards for toilet facilities for industrial workers are determined based on a ratio that is the ratio of the number of toilets to the number of workers. The ratio of toilet facilities differs between men and women. If the toilet is used by male workers, there must be a urinal/urinary at most 1/3 of the number of toilets provided. **(see also Chapter IV)**

Access to improved, safe, and convenient toilet facilities

Facilities should be in line with local customs, religious and social traditions. For outdoor setting sites, portable toilets are appropriate when properly maintained, including the safe removal and disposal of waste. Facilities must also have toilets that are accessible to workers with mobility challenges such as the disabled and elderly workers, adequate enclosures to provide gender separation, protection from weather and exclusion of insects and vermin. The toilets must have appropriate ventilation in place to remove odors for users and others in proximity. Appropriate provision must also be made in the design and construction of facilities to ensure adequate permanent lighting for safety purposes and all toilet doors can be locked.

Toilet and urinal waste management safety

Toilets and urinals must be designed and constructed to ensure the safe removal of urine and excrement, with collection and disposal that does not create a danger to health or the environment, i.e., treated before it is returned to the environment or conveyed into a municipal sewer system.

Toilet and urinal cleaning and maintenance

Provisions must be made for regular inspection, maintenance and repair of toilet facilities to ensure they are in proper working order. All toilet facilities must be cleaned at least once a day, with extensive cleaning, i.e. disinfection, at least once a week. More frequent maintenance and repairs should be conducted if issues are reported by employees.

Hygiene at Workplace

Menstrual hygiene management (MHM)

All female worker toilets should have water and soap to ensure proper MHM. Facilities for safe disposal of sanitary products should also be available in the women's toilet facilities. In addition, MHM in the workplace is also influenced by the access of women workers to sanitary napkin products at the work site, whether provided free of charge by the company or purchased inside/outside the work site easily and affordably, and the availability of personal storage space (eg. lockers) to store sanitary napkins at work. Although the Manpower Law No. 13 of 2003 article 81 paragraph 1 obliges companies to grant menstrual leave rights to every female worker on the first and second day of menstruation, the factors described above will ultimately influence female workers to continue working during their menstrual period.

Handwashing facilities and appropriate handwashing behavior and awareness

In addition to toilets, hand washing stations with soap and running water must also be located in various locations in the workplace to provide opportunities for workers to

practice hand washing anytime anywhere, especially during the current COVID-19 outbreak. Signage for hand-washing practices should also be provided, including technique and for critical times. Critical times for handwashing include: before food preparation and eating; and after using the toilet, cleaning babies' bottoms, contact with bodily fluids, and contact with any potential contaminants. Hand-washing technique includes use of water and soap, washing both hands, rubbing hands together at least three times, and drying hands hygienically – by air drying or using a clean cloth or paper.

7.2.1.4 Companies Awareness to Climate Change, Social Responsibility Program and Disaster Emergency Response

Wastewater, drainage, toilet and urinal waste management safety

All washbasins, sinks, showers, toilets, etc. must be provided with adequate drainage and disposal systems. Drainage and disposal systems should be designed to rapidly and cleanly remove wastewater from where it is produced, provide vector control and prevent contamination in the immediate vicinity and the broader environment through adequate off- or on-site treatment facilities. Waste treatment facilities that are built must be adjusted to the standard of liquid waste disposal for each industry which can vary. Government regulations regarding quality standards for liquid waste from 35 types of industries refers to the Regulation of the Minister of Environment and Forestry Number 5 of 2014 concerning Wastewater Quality Standards.

The impacts of climate change are already being felt through water scarcity

Water that becomes scarce will result in an increase in the cost of water. This in turn will not only disrupt the company's business but also cause inequality in the access of households and surrounding communities to collect clean water needed for hand washing and proper hygiene which in turn will limit children's ability to grow up healthy and strong.

Corporate social responsibility and disaster risk

Businesses are expected to have taken steps to identify and anticipate not only the environmental impacts associated with their business activities on the surrounding community but also the risks from natural disasters to their businesses. Internally, it is important for the company to conduct worker training in anticipating disasters due to changes in environmental conditions that can affect the health of workers (eg floods, COVID-19 disease outbreaks). In addition, the potential of the company's CSR funds can be used for emergency response and recovery activities during disasters in addition to giving back to the surrounding community affected by the company's operations.

7.3 Designing WASH Interventions in the Workplace, Across the Value Chain, and Communities

There is no 'one-size-fits-all' with WASH interventions – they are context specific. Businesses operate within a set of communities with independent governance and service

delivery mechanisms. While it is appropriate for businesses to deliver WASH services in the workplace, the method of interventions within surrounding communities and through supply chains should ideally be designed to strengthen local governance and service delivery systems.

Addressing WASH in the workplace also brings with it some unique challenges, including:

- Conditions in offices, in factories, and on farms vary widely, from large, sparsely populated agricultural settings to tens of thousands of workers in mega factories working on assembly lines. The cost of these interventions may vary widely based on these different circumstances
- Understanding and effectively responding to the connection between a community's access to WASH and related issues in the workplace can be difficult.
- Behavior change, not just the installation of hardware (such as taps, toilets and sinks), is critical to ensuring the effectiveness of WASH interventions.

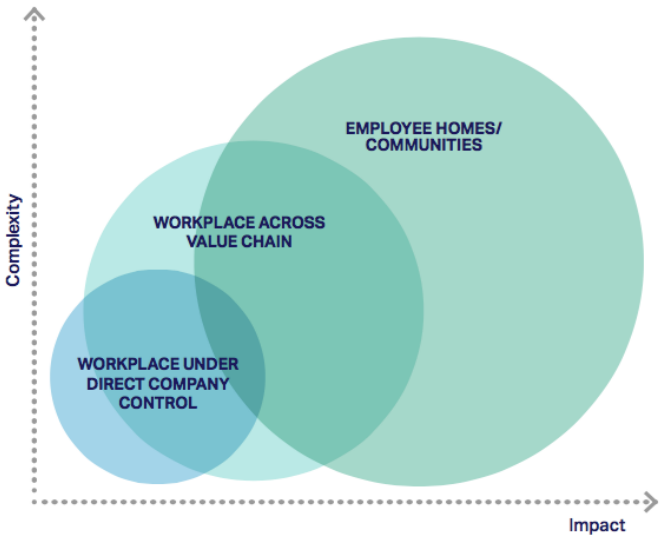
A non-exhaustive list of some WASH issues experienced by workers and some key behavioral change components of WASH that should be considered when undertaking WASH interventions are included below for reference:

Hardware-Related WASH Issues. Examples: • Absence of potable water, toilets, handwashing facilities, showers and/or lack of attention to the accessibility of services for all types of workers • Particularly important where workers are using chemicals, pesticides, or other products that would need to be cleaned/washed away • Lack of facilities precludes women and girls from having time and privacy to attend to menstrual hygiene needs
Absence of adequate menstrual hygiene materials and services for their disposal. Examples: No provision of sanitary napkins, subsidies to help defray costs, facilities to wash or dry menstrual cloths, lack of facilities for disposing of sanitary pads or menstrual cloths
Inability to access potable water, sanitation, and hygiene services due to work schedules. Example: • Only one break during an eight-hour day, inability to leave the assembly line to use facilities during peak production hours • Long hours on farms during harvest season
Behavioral change components of WASH. Examples: • Understanding what type of sanitation services are culturally acceptable and will be used by a certain community

- Finding mechanisms to motivate workers to adopt more hygienic practices (such as washing hands with soap at critical times, safe water handling, safe excreta disposal)
- Cultural barriers related to discussions about menstrual hygiene:
    - Difficulty raising menstrual hygiene matters with male managers
    - Managers don't understand the need for additional time in the toilet or washroom
- Absence of information on good practices on handwashing with soap and menstrual hygiene

Behavioral change aspects of WASH are important to consider as sanitation and hygiene are intricately linked to social norms. To ensure the use of WASH services requires understanding the underlying norms that may help or hinder certain types of interventions and the design of facilities or education programs that overcome cultural barriers and meet local needs. Manufacturers face challenges related to where their contract factories operate, often in regions of the world with vastly different local government capacities and legal environments. In these circumstances, corporations working to bring supply chain changes are less able to rely on the regulatory environment to set a baseline on issues like WASH for workers and must rely on their own programs and practices.

Where appropriate, businesses should partner with wider stakeholders, for example local governments and the mandated service providers and/or support agencies (including non-governmental organisations and international organisations such as the UN agencies), for the delivery of services beyond the business. This collaboration potentially provides much wider benefits and may also generate improved legitimacy to operate with the authorities. However, this does imply less direct control of the results, and may require greater attention to measurement techniques and longer lead times to realise impacts.



Self-assessment tools can help identify areas for improvement not only to **improve access to WASH within the company's internal environment** but also **along the value chain** and **surrounding communities**. 'Value chain' refers to all upstream and downstream activities associated with the operations of the reporting company. This section includes a plan to move from implementation of WASH at a company's own premises then across its value chains and finally within employee homes and communities.

Plans to address gaps in WASH access within company sites, along the value chain, and surrounding communities identified during the self-assessment could include a variety of activities as part of WASH investments as described in the previous section of this document which are broadly grouped into:

- Improvement of WASH provision and facilities, and
- Implementation of educational and behavioral change materials and activities

The plan also and includes monitoring, evaluation and disclosure to demonstrate action by individual companies. This represents a high-level overview of value chain engagement. Businesses are encouraged to visit www.wash4work.org to see what other businesses have undertaken in their value chains.

7.3.1 Delivering WASH Services within the Companies Internal Environment

The commitment of businesses to improve WASH conditions must be demonstrated by their compliance with regulations, policies and norms regarding the fulfillment of workers' access to WASH in the workplace. The company should also develop internal guidance that meets or exceeds the laws and regulations and/or applicable international standards. WASH provisions must be in place for all work sites including production facilities, offices, creches, canteens, kitchens or health clinics that are used by workers at places of work. Some examples of internal policies that companies can implement regarding WASH implementation can be seen in the following box.

Selected Companies' WASH Policies and Commitments

Diageo's 'Water Blueprint'

- Enable communities through the provision of safe water and sanitation by developing Water of Life projects in the water-stressed watersheds where our production sites are located.
- Ensure appropriate access to safe water, sanitation and hygiene for all employees in all premises under Diageo's control.

H&M's 'Sustainability Commitment' for business partners

- Access to clean drinking water and toilet facilities in the workplace is a fundamental part of expected safe and hygienic working environment for employees.
- Business partners are expected to apply the requirements and approach outlined in this Commitment in their supply chains.

Nestlé's 'Guidelines on Respecting the Human Right to Water and Sanitation'

- Nestlé factories and suppliers are encouraged to fill identified gaps in the areas of water, sanitation and hygiene for employees and communities.
- All Nestlé factories have committed to provide WASH services to employees. Nestlé factories in high-risk areas are additionally encouraged to support access to WASH among factory- surrounding communities.

Unilever's 'Sustainable Living Plan and Related Standards'

- Fully integrating WASH within own workplace and manufacturing sites, through safety, health and environment standards.
- Ensuring good access to WASH for external suppliers through independent certification; Unilever's Sustainable Agriculture Code; or, for those suppliers assessed as high risk, as part of the audit for Unilever's Responsible Sourcing Policy.

An integrated approach that addresses all water impacts and risks is vital. In this manner, companies may need to create a cross-functional approach, situating the issue within a team, such as those responsible for water, but then ensuring that the issue is taken up by those working in operations, procurement, environmental, or social issues who have responsibility for not only developing but also implementing policies. In this way, the issue of WASH gets embedded into a variety of polices and implementation structures that apply to not only to the companies' owned and operated facilities but also beyond, into supply chains and local communities.

Building accountability for WASH is also important, requiring ownership and buy-in by relevant business units or local subsidiaries. One way of doing so is to create internal accountability structures and reporting around WASH. For the most part, corporations are situating such action in their corporate water policy or stewardship teams. However, reporting on WASH is still fairly weak. In the aforementioned WBCSD, CEO Water Mandate, WaterAid survey, only 50% of respondents had internal reporting mechanisms for WASH, indicating that there is a significant gap to be filled that covers not just the number of beneficiaries from WASH investments but the impact of these investments.

Also, the company's internal policies will be the basis for the company to bind and involve all company internal stakeholders in fulfilling WASH access in the workplace through a series of WASH facilities development activities and behavior change campaigns as a company's WASH investment which will ultimately have the expected impact on the company, supply chain partners, as well as the surrounding community. This requires a precondition for businesses to also have data on basic WASH conditions to ensure that the adequacy of facilities for all workers can be tracked. Adequate mechanisms must be in place to monitor and assess the functionality of the WASH system, in accordance with regulations and standards.

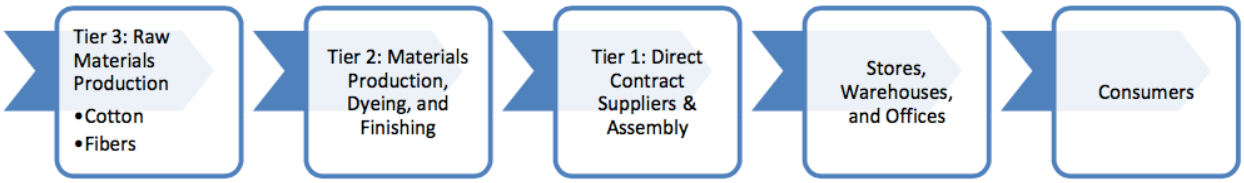
7.3.2 Scaling Businesses Action on Access to Water, Sanitation and Hygiene in Value Chains

Companies increasingly recognize that many of their labor and water-related challenges are not confined to their owned and operated facilities, but that they also exist in their supply chains. Increasing consumer and public awareness of social, labor, and environmental issues in supply chains, combined with companies' own awareness of their supply chain risks, have led companies to pursue strategies to instill sustainability

practices throughout their extensive and complex supply chains.

One industry that has paid special attention to dealing with WASH issues is the apparel and textile industry. The apparel and textile industry has many programs tied to the health of factory workers, which has led to their focus on WASH. Workers in apparel and textile production and in rural/agricultural contexts are also predominantly women. Today, 60% of women working in sub-Saharan Africa and South Asia work in agriculture (ILO, 2009), and are disproportionately affected by lack of WASH. However, the issue of WASH needs to be understood as one among a range of sustainability issues.

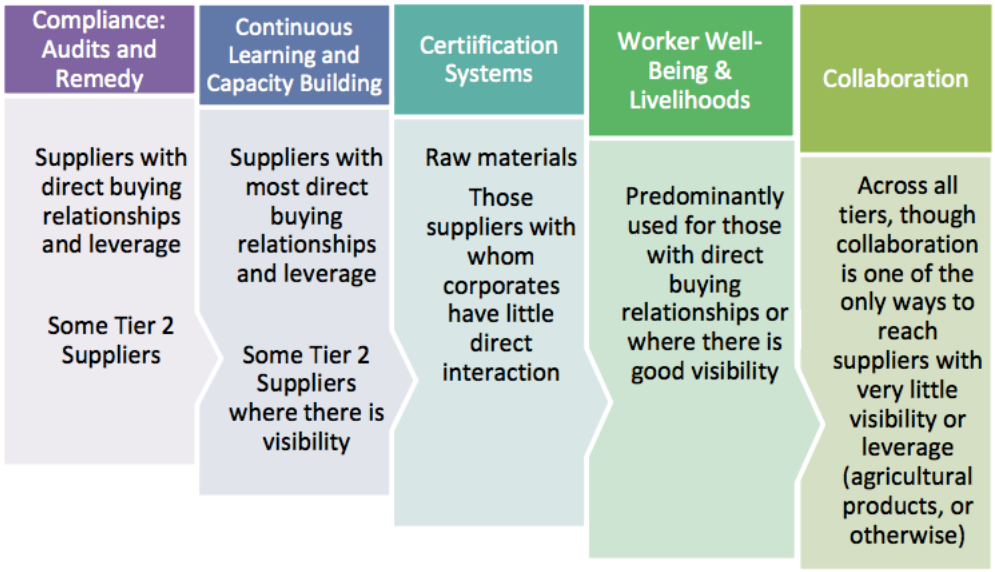
The apparel and textile industry, similarly, has a complex value chain which is generalized in Figure below:



Some of the main issues that stand out in the apparel sector value chains, such as those related to labor, health and welfare, sustainable agriculture, water security, pollution, and human rights. WASH for workers is relevant and impacts all these issue areas. Therefore, tackling WASH can become a cornerstone for effectively addressing other key sustainability issues.

The complexity of WASH for workers in supply chains requires companies to take a multi-pronged approach to WASH. As it touches on labor, health, safety, and environmental aspects, and water stewardship generally, the approach that companies take to tackling WASH means that it has the potential to be orphaned or subjugated to other topics. In some circumstances, as a standalone topic, it may be deemed less important to the company. Understanding the importance that WASH has for meeting other sustainability goals, whether it is to ensure greater protection of human rights, to help meet the company's water policies and commitments to water stewardships, or to achieve sustainable procurement and more resilient supply chains, can ensure that it is not overlooked.

Company policies and programs on WASH in the supply chain span an array of approaches from compliance-based to collaborative models. A brief summary of these options is shown in Figure below.



Improving WASH practices across the value chain involves developing a supplier code of conduct that complies with local and national laws and regulations and includes the WASH points of reference. The supplier code of conduct should also strive to comply with the leading practices provided in the WASH Pledge self-assessment tool for business. After the code of conduct is developed, businesses should work to promote WASH implementation and monitoring in their value chain, with the value chain partners ultimately responsible for implementing and, at a minimum self-monitoring, their WASH activities. Benefits of monitoring includes the ability to address specific issues needing corrective action, an increased understanding of capabilities and the ability to make improvements as needed.

Business is encouraged to include its Tier 1 suppliers of raw materials and purchased goods and services under the WASH Pledge. Tier 1 suppliers are companies with which the reporting company has a purchase order for raw materials, components, goods, services, or manufacturing related to the production of products or services sold by the reporting company. Value chain partners should be encouraged to identify areas of non-compliance with their internal code of conduct and safe WASH provision. Companies are encouraged to work directly with their suppliers to develop a plan of corrective action to be implemented by the supplier.

Beyond compliance, companies are developing programs that focus on increasing workers' well-being livelihoods. Identifying the types of topics that these programs undertake may come from an assessment of companies' audit programs, though they usually require direct engagement with workers on farms or in factories to understand their needs. These programs often cover such issues as:

- Educating workers on their rights
- Involving workers in production decisions to improve productivity and worker well-being
- Health programs that include hygiene, sex education, and reproductive health

- Environment programs that cover issues of water access, environmental preparedness, and resilience

These programs are based on the understanding that healthy workers are essential to the well-being of the company. Companies embed programs in various ways. Some have made WASH delivery part of their sustainable water programs, while others have created programs within broader worker welfare initiatives. The characteristics of these programs include:

- A focus on creating long-term good relationships with suppliers in order to strengthen their supply chains.
- Grounding programs via engagement with workers to identify local needs.
- To the extent possible, increasing local ownership of the programs by co-funding the programs with suppliers or embedding the program into supplier operations.
- Working with relevant implementation partners who can act as subject matter experts and neutral facilitators for the programs.

Another avenue that companies have begun to explore is to incorporate WASH into broad industry initiatives. For example, WASH is integrated into good practice as outlined by **the Pharmaceutical Supply Chain Initiative** and **the Electronics Industry Citizenship Coalition**, and is being explored as part of **the Sustainable Agriculture Initiative Platform**. By working across companies in an industry, common norms can be set and good practice leveraged by an array of companies rather than taking independent siloed actions.

7.3.3 Employee Homes and Communities

Some companies are beginning to understand the connection between workplace-centered programs and community-centered programs, and the need to approach both communities and the workplace to create a more holistic approach to WASH. To be able to do this, the first step involved is to determine the percentage of the population that has access to safe WASH within the company's operations. If the country being evaluated does not have full access to safe WASH, it is recommended that companies measure the level of access in their homes and working communities. This can be undertaken using available data and reports; discussion with governments and organizations with knowledge of conditions; and collecting information directly from households and communities.

If less than 100 % of workers and the communities where they live have access to safe WASH in their homes, the business is encouraged to formulate a plan to identify and address gaps. The plan should be informed by the assessment process, including identifying reasons for households not having access, such as financial, technical or infrastructure issues, and educational and behavior change issues. The plan to address gaps may include:

- Developing rewards and incentives for workers to improve access to safe WASH at home
- Partnering with local communities, governments, NGOs, academia and other

businesses to improve WASH provisions, and
- Distribution and implementation of educational and behavioral change materials and activities

One of the significant added benefits of undertaking such an approach is the possibility of addressing not only the hardware aspects of WASH, but also the behavioral aspects, by working with workers and communities on issues such as hygiene education. The approach also allows program implementers to get a much more nuanced understanding of the types of interventions that will lead to positive, long-term outcomes.

Following any interventions by a business or its partners, companies should continue to monitor their workers and/or community's level of WASH access over time to measure change in access, implementation issues, and whether interventions are being sustained. WASH facilities require regular maintenance to ensure effective operation and sustainability, and this should be addressed in WASH implementation plans as well.

7.3.4 Disclosure and Communication

Companies must report their assessment findings, actions and results internally, and develop a mechanism to monitor implementation and progress within established company operations. It is recommended that companies disclose progress made in access to safe WASH across their value chain at least annually in public reporting or communications. Disclosure and communication demonstrate commitment and give companies a platform to showcase the benefits of increased access to WASH provisions. It can also give companies legitimacy to call for improvements in surrounding communities. Given the interdependence between companies and surrounding communities within watersheds and the environment, disclosure and communication can also provide investors with a better understanding of how a company is working to mitigate risk, preserve essential water resources and maintain its social license to operate.

Any interventions the company undertakes should be guided by best practices in the WASH sector and work to move households to higher levels of service to support achievement of the SDGs. For example, any constructed toilet facilities should ensure that users are prevented from having contact with fecal waste contents, and that there is a method in place for waste to be safely managed. Businesses are encouraged to partner with WASH sector professionals and governments to determine interventions that are appropriate for the communities in question. For key household questions and definitions for water, sanitation and hygiene facilities see the JMP's Core questions on water, sanitation and hygiene for household surveys.

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