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GERMAS
Gerakan Masyarakat
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ANNUAL REPORT

Drinking Water Quality Monitoring

Year 2022



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Ministry Health RI. 2023. Annual Report of Drinking Water Quality Monitoring in 2022



Remarks

Ministry of Health the Republic of Indonesia

Access to safe drinking water in Indonesia remains relatively low. To address this, the Indonesian government is committed to achieving Target 6.1 by 2030, aiming for universal access to safe and affordable drinking water. This commitment requires us to monitor and maximize the quality of safe drinking water for all Indonesian people.

From 2020 to 2024, the government has set targets for Indonesia to achieve 100% access to decent drinking water and 15% access to safe drinking water. The Ministry of Health plays a crucial role in monitoring the quality of drinking water through external monitoring and surveillance of household drinking water.

The 2022 annual report of Drinking Water Quality Monitoring (PKAM) will be a valuable reference for decision-making at all government levels, helping to evaluate and improve strategies, including policies, programs, plans, and evaluations, with a particular emphasis on PKAM.

I extend my most profound appreciation to all the parties involved for their hard work, dedication, and support in ensuring the safety of our drinking water. We will persist in making various efforts to enhance drinking water quality, aiming to provide access to quality drinking water for all.

We hope that the 2022 annual report on Drinking Water Quality Monitoring (PKAM) will be beneficial in increasing the quality of drinking water for the public.

Ministry of Health

A handwritten signature in black ink, appearing to read 'Budi G. Sadikin'. The signature is fluid and cursive.

BUDI G. SADIKIN

Foreword

Director General for Disease Prevention and Control



Access to safe drinking water and sanitation is a fundamental human right, internationally recognized based on the right to an adequate standard of living, as acknowledged by the United Nations General Assembly on 28 July 2018. Global data in 2020 revealed that 74% of the international population had access to safe drinking water. However, a striking two billion people still lack this basic necessity.

In 2024, the Indonesian Government aims to achieve 100% access to suitable drinking water and 15% access to safe drinking water. Various efforts have been made to strengthen the monitoring system and implementation policies for drinking water quality. These efforts focus on both the drinking water production process and the steps taken by providers to ensure the safety of the water for public consumption. This monitoring is a mandatory step that should be done by the provider and the government as the regulator.

The availability of drinking water in Indonesia is influenced by the country's diverse geography, leading to variations in water sources across regions due to different topographies and environments. This geographic diversity poses a challenge for monitoring drinking water quality in the region. In addition, there is a need for reinforcement in the reporting system to integrate information from different areas.

The 2022 annual report for Drinking Water Quality Monitoring (PKAM) is set to be a guide for essential decisions at various government levels, such as national, provincial, or city governments. It will assist in evaluating better approaches, including policies, programs, plans, implementation, and assessments, especially for monitoring drinking water quality (PKAM).

We express our appreciation to all stakeholders who invested time and expertise in preparing the 2022 annual report for Drinking Water Quality Monitoring (PKAM). We believe this report will contribute to improving public drinking water quality.

Director General of Disease Prevention and Control (P2P)
Ministry of Health of the Republic of Indonesia

A handwritten signature in blue ink, consisting of several fluid, connected strokes that form the name 'Maxi Rein Rondonuwu'.

Dr. dr. Maxi Rein Rondonuwu, DHSM, MARS

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1. Abstract

Safe drinking water is a basic need for the people which must meet the requirements of physics, microbiology and chemistry, however, at this moment the access to a safe drinking water is still low in Indonesia. The government has targeted in the year of 2020-2024, for Indonesia to own a 100% access to a suitable drinking water and a 15% access to a safe drinking water. Even so, The Quality Study of Household Drinking Water (SKAMRT) in Year 2020 states that the access to a safe drinking water has only reached 11.8%. This is consistent to the condition of Indonesia's wide and diverse geographic so the sources of drinking water availability also differ according to the contours of the region and environment. Various attempts have been made to increase access to safe drinking water for the community either through increasing coverage of piped drinking water users and the implementation of Appropriate Technology for drinking water and monitoring the quality of drinking water is also done by drinking water provider and by the government from various regions which are then processed into various data of safe drinking water qualities in Indonesia. Various efforts to strengthen the system and implementation policy of drinking water quality monitoring has been carried out not only on the aspect of drinking water production results but also from the process done by the drinking water provider. The efforts that have been made are compiling a map of drinking water supervision track (2020-2030), revise the regulation of drinking water into an integrated regulation from The Planning of Drinking Water Preservation (RPAM), safe drinking water standards, and audit RPAM which is stated in The Ministry of Health Regulation Number 2 of 2023 concerning The Implementation of Government Regulation No. 66 of 2014 concerning Environmental Health. With Indonesia's geographical conditions, an inspection of drinking water quality in Indonesia is a challenge in itself apart from the need to strengthen the reporting system information which integrated from the area.

2. Situation of 2022



“In Indonesia, safe drinking water access by the end of 2022 has still not reached the safe drinking water target of 15% in 2024”

2.1 Safe Drinking Water

Through the quality aspect point of view, safe drinking water is one that meets the standards which are not polluted by substances in physical, chemical and microbiological parameters that endanger health be it directly or indirectly. Drinking water quality standards in Indonesia are regulated in Ministry of Health Regulation Number 492/MENKES/PER/IV/2010 regarding drinking water quality requirements. The Ministry of Health Regulation explains that drinking water that is suitable for consumption is water that is safe physically, chemically, microbiologically. Aside from the Regulation Ministry Health Number 492/MENKES/PER/IV/2010 there is Regulation Ministry Health Number 736/MENKES/PER/VI/2010 Regarding Drinking Water Quality Monitoring which control the external supervision carried by drinking water provider/organizer managed with pipelines or non-pipelines as well as the internal supervision conducted by the Public Health Office in the province, district/ city, and Sanitary Puskesmas to

drinking water facilities with pipelines or non-pipelines.

In the Regulation of the Ministry of Health Number 492/MENKES/PER/IV/2010 in the Regulation of the Ministry of Health Number 492/MENKES/PER/IV/2010, it also explained that the drinking water provider must guarantee that drinking water is safe for consumption. The drinking water providers/organizers mentioned above include State-Owned Enterprises (BUMN)/ Region-Owned Enterprises (BUMD), cooperatives, private enterprises, individual enterprises, community groups, and/or individuals who organize drinking water supply. Drinking water quality monitoring is also related to the process and distribution to consume piped drinking water. The relation between treatment carried out by drinking water providers/organizers and supervision can be described as follows.

In Figure 1. Good drinking water treatment sourced from surface water, groundwater, springs and other sources will then have an impact on the quality of drinking water consumed by the community (Picture 1).

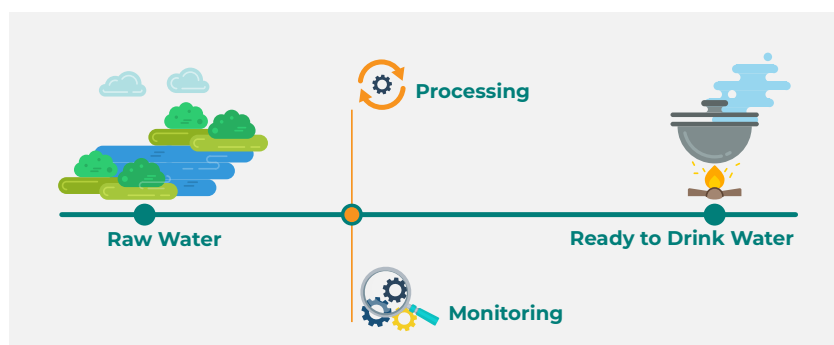


Figure 1. Influence relation between drinking water treatment and monitoring

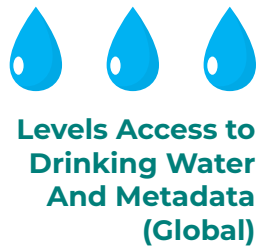
Access to drinking water according to the WHO/UNICEF Joint Monitoring Program for Water Supply, Sanitation and Hygiene (JMP) is that an improved source is one that has the potential to deliver safe water according to its design and construction. This includes piped supplies (such as households with piped water in their homes, yards or plots or public stand paste) and non-piped supplies (such as boreholes, protected wells and springs, rainwater and bottled or delivered water).

2.2 Levels of Access to Safe Drinking Water

There are levels of access to drinking water and metadata (Global) as shown in Figure 2, which are:

1. **Safely Managed:** Drinking water from an improved water sources that are accessible on premises, available when needed and free from fecal contamination and priority chemicals contaminations.
2. **Basic:** Drinking water from an improved source, which should be collected within the time period that is no more than 30 minutes.
3. **Limited:** Drinking water from a better source, which collection time period is more than 30 minutes.
4. **Unimproved:** Drinking water from an unprotected dug well or unprotected springs.
5. **Surface Water:** Drinking water directly from rivers, dams, lakes, ponds, streams, canals or irrigation canals.

Picture 1. Levels of Access to Safe Drinking Water



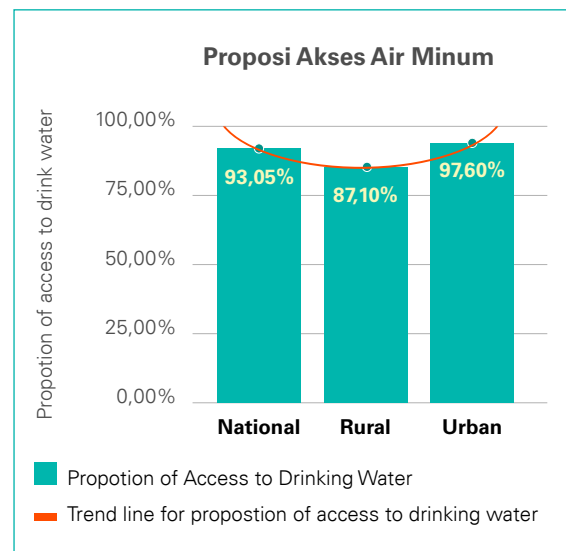
SAFELY MANAGED	Drinking water from an improved water source that is accessible on premises, available when needed and free faecal and priority chemical contamination
BASIC	Drinking water from an improved source, provided collection time is not more than 30 minutes for a roundtrip including queuing
LIMITED	Drinking water from an improved source for which collection time exceeds 30 minutes for a roundtrip including queuing
UNIMPROVED	Drinking water from an unprotected dug well or unprotected spring
SURFACE WATER	Drinking water directly from a river, dam, lake, pond, canal or irrigation canal

Source: Drinking water and sanitation ladder (Drinking Water Cross Field Coordination and sanitation Directorate of Housing area and Region Settlements, Bappenas)

2.3 Household Drinking Water Services in Indonesia

In 2020, the Center for Research and Development of Public Health Efforts, Research and Development Department of the Ministry of Health, conducted the Household Drinking Water Quality Study in Indonesia (SKAMRT) which aims to obtain information on the quality of drinking water at the household level in Indonesia. The study found that nationally, 11.8% of Indonesian households have access to safe drinking water quality as measured by E.Coli, pH, nitrate and nitrite parameters. The study also found that there is a difference in the proportion of access to drinking water in urban and rural areas. National safe drinking water access has reached 93.05%, while the proportion in urban areas is 97.60% and in rural areas 87.10% (Table 1).

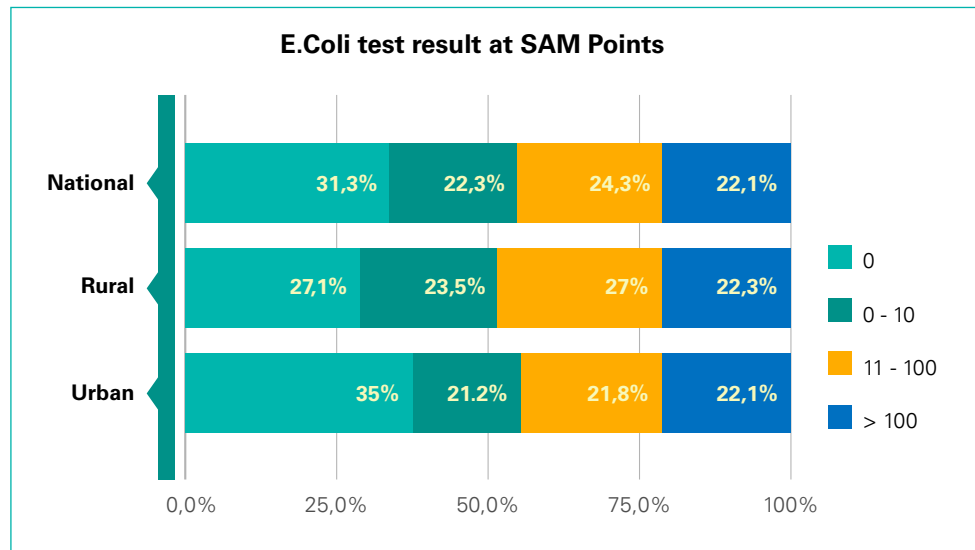
Table 1. Proportion of access to drinking water



Source: SKAMRT 2020

From the SKAMRT 2020 results, the microbiological parameter aspect of E.Coli for the household proportion of Drinking Water Facilities (SAM) nationally, only 31.3% of SAMs have zero E.Coli test results, meanwhile in rural and urban areas, each has 27.1% and 35% results respectively. (Table 2).

Table 2. E.Coli test result at SAM Points

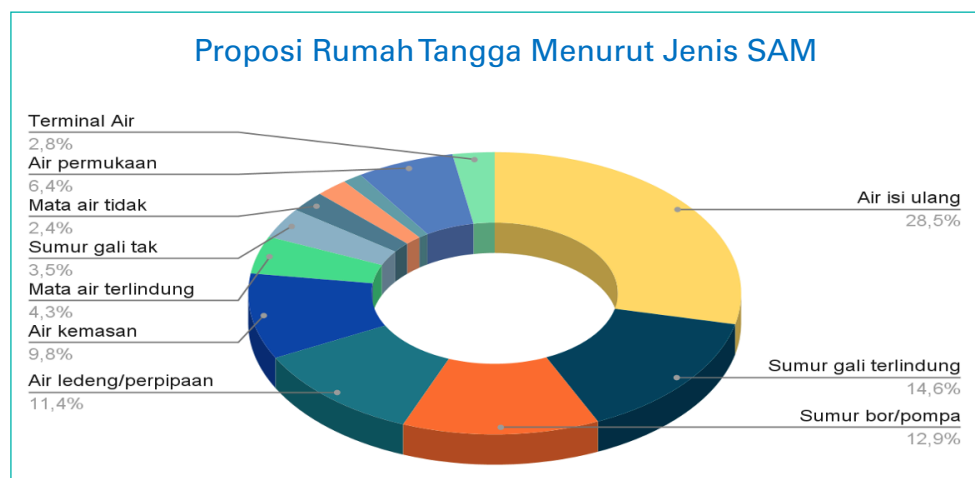


Source: SKAMRT 2020

2.4 Drinking Water Service Ecosystem in Indonesia

Dari hasil analisis Surveilans Kualitas Air Minum Rumah Tangga di Indonesia Tahun 2021 didapatkan baru 11,4% masyarakat menggunakan air ledeng/air perpipaan dan sisanya menggunakan sarana air minum non perpipaan antara lain dari depot air minum, sumur gali terlindung, sumur bor/pompa, air kemasan, air permukaan dan sumber lainnya. (Tabel 3).

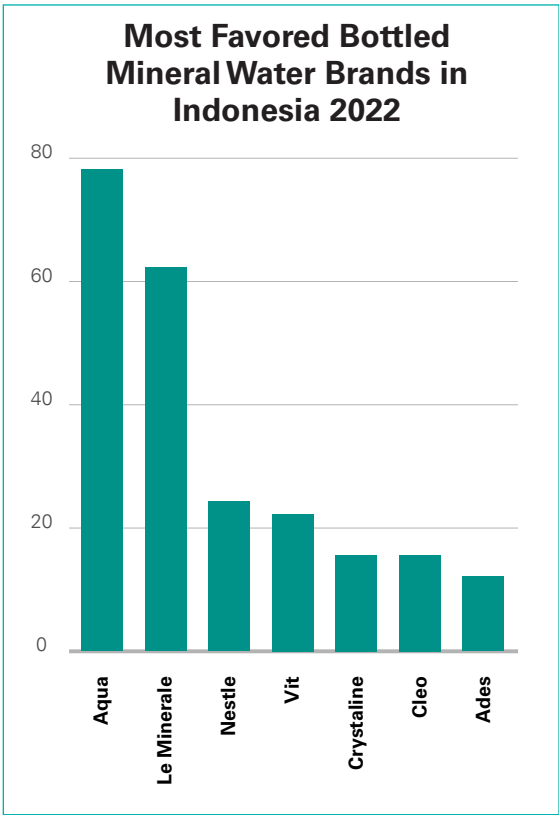
Table 3. Proportions of Household According to SAM Type



Source: Household Drinking Water Quality Surveillance Study Results in Year 2021

Based on this data, it can be seen that people prefer to use refillable water and protected dug wells to piped water for drinking water consumption and for other purposes outside drinking water such as for rinsing and washing. According to regional data in Java and Bali, 15.1% of people choose to use bottled water and 27.5% of them use refillable water. This is motivated by the affordability and availability of SAM in the community and the practicality of meeting daily water needs. Nationally, 57.9% of people choose to buy drinking water with an average monthly expenditure of <Rp 100,000. In addition to refillable water, 9.8% of people choose to use bottled water. Based on the results of the Jejak Pendapat (JakPat) survey, there are various brands of bottled water or mineral water in bottles that are the most preferred water brands in Indonesia, namely (Table 4).

Table 4. Most Preferred Bottled Mineral Water Brand in Indonesia



There are various reasons why people choose to consume mineral water in gallons or bottles such as price affordability and accessibility because it can be purchased at mini markets/ stalls or refilled at drinking water depots close to their residences. On the other hand, regional drinking water companies spread across various districts and cities in Indonesia have not been able to fully distribute water that is ready to drink to their customers due to many factors such as old pipelines and piping leakage rates which are still high in percentages. Some regional drinking water companies have developed innovations, one of which is by creating a Prime Drinking Water Zone (ZAMP).

2.5 Safe Drinking Water Facilities

Supervision of safe drinking water facilities is guaranteed for the entire community to have access to. The various types of SAMs are supervised by various parties and the role in the supervision is mainly carried out by the Ministry of Health and the Food and Drug Monitoring Department (Table 5).

Table 5. Type Sam and Supervisor

Type Sam	Party Which Supervise
Bottled mineral water	BPOM
Water refill, well sheltered Dig, borehole/ pump, eye water protected, no dug well protected and water surface and PDAM (External)	Ministry Health Republic Indonesia



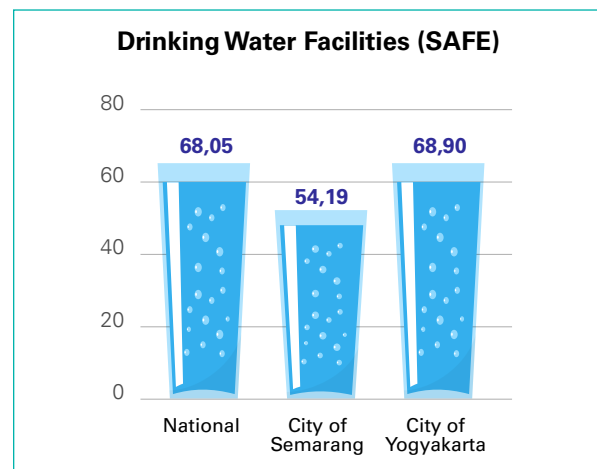
“The rejuvenation of the pipeline network with HDPE pipes and network expansion is one of the efforts from piped drinking water companies (PDAMs) in Indonesia to increase the coverage of safe drinking water for the people of Indonesia”

The problem of safe drinking water is not only from the aspect of quantity but there is an influence from the aspect of water quality. Water quality is also affected by environmental pollution of various types. One of the environmental pollution that affects water quality is community behavior related to open defecation.

The results of the achievement of Indonesia’s drinking water quality monitoring indicators in 2022 carried out in 514 districts and cities spread across Indonesia are illustrated in Table 4, nationally, drinking water quality monitoring has exceeded the national achievement target with an average achievement of 68.05% of safe drinking water facilities inspected. The achievement of supervision of drinking water facilities in 2020 was 57.8% and in 2021 was 72.97%. However, there are still challenges, which are measures to achieve the target according to the strategic plan of the Ministry of Health of the Republic of Indonesia in 2020-2024. It’s to target drinking water facilities that are supervised for drinking water quality according to the standards by 76% in 2024. Another challenge is in reporting the results of the annual drinking water

quality monitoring carried out per quarter (TW) is the report of drinking water quality data from the samples examined (Table 6).

Table 6. Safe Drinking Water Facility



One of the activities that are part of monitoring drinking water quality in 2022 is Household Drinking Water Quality Surveillance (KAMRT) to obtain the number of access to safe drinking water in households. Nationally, according to the 2022 Household Drinking Water Quality Surveillance (KAMRT) data, the national average of safe drinking water quality is 21.98% of the people have access to safe drinking water, but this figure has yet to describe the overall nationwide condition due to differences in methods, diversity of sample placements between regions and the fact that not all districts / cities in all provinces have done it.



Picture 2. Ready-to-Drink Water in School

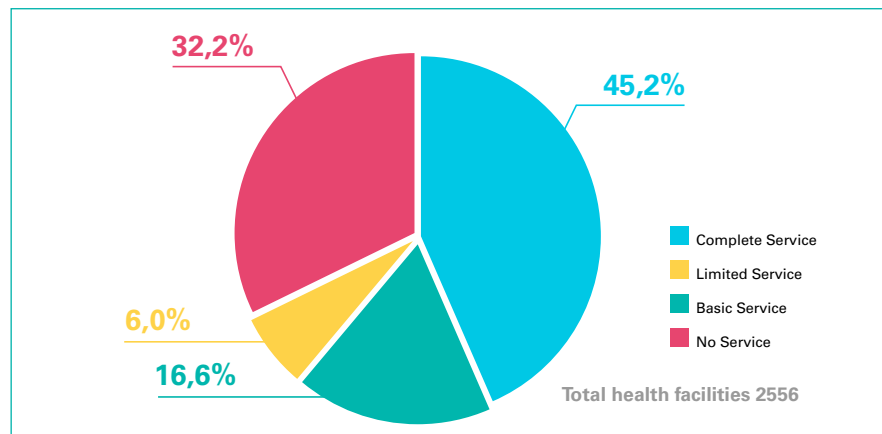
Drinking water quality monitoring is part of the Ministry of Health's responsibilities. It aims to protect and monitor the quality of water consumed by the community and as one of the efforts to protect public health. One measurement of success in monitoring drinking water quality is the reduction in mortality and morbidity of various waterborne diseases, such as diarrhea.

The availability of drinking water facilities located in Public Facilities (TFU) which are public places or facilities used for community activities and

organized by the government/private sector or individuals such as Puskesmas and schools in Indonesia also require attention.

In 2022, nationally with a total of 2556 health centers, 45.2% of them have full services, decent water source that is available throughout the year and meet the quality regulations for clean water physically, chemically and microbiologically, 32.2% of them have no water services. Meanwhile, 16.6% of health facilities have only basic water services.

Picture 3. Water Base Service in Health Facility



As for schools in Indonesia, only 66% of them have access to drinking water, while 3% have limited access, and 31% have no access to safe drinking water.

2.6 Regional Healthy Drinking Water Company and Safe Drinking Water

Regional drinking water companies in the form of regional public companies (perumda) or regional limited liability companies (perseroda) are regionally-owned business entities in districts/cities in Indonesia that have the role of providing safe drinking water facilities in their regions. There are currently 1,097 drinking water perumda/perseroda in Indonesia, which prior to the issuance of Government Regulation No. 54 of 2017 were all known as PDAMs in each region. As a drinking water provider, perumda/ perseroda also supervises the quality of drinking water it produces, starting from the quality of raw water sources, the quality of produced water and the quality of water at the consumer point, all of which are called internal drinking water supervision. External supervision is also carried out on the quality of drinking water perumda/perseroda conducted by the district/city health office whose data is integrated in Quarterly (TW) reporting.

In accordance with the title of the sub-chapter, Drinking Water Regional Companies, Healthy Safe Drinking Water, drinking water perumda/ perseroda also have annual performance reports that refer to the performance indicators of BPP SPAM and Permendagri No 47 of 1999. In the BPP SPAM performance indicator report, there are 4 assessment indicators, which are financial, service, operational and human resources (HR) and drinking water quality results are one of the sub indicators of the operational indicator.

The final score of the four indicators results in three (3) perumda/perseroda performance categories, which are:

- 1. Healthy performance, with performance mark more than 2,8 (>2,8).
- 2. Less Healthy performance, with performance mark from 2,2 until with 2,8 (2,2 – 2,8).
- 3. Sick performance, with performance mark less than 2,2 (< 2,2)

Based on the BUMD drinking water performance report (BUMD Drinking Water Kineja Assessment Report), nationally from a total of 389 BUMD Drinking Water that has been assessed for performance has an average performance value of 3.20 with a healthy category of 237 BUMD Drinking Water, a less healthy category of 101 BUMD Drinking Water, and a sick category of 51 BUMD Drinking Water.

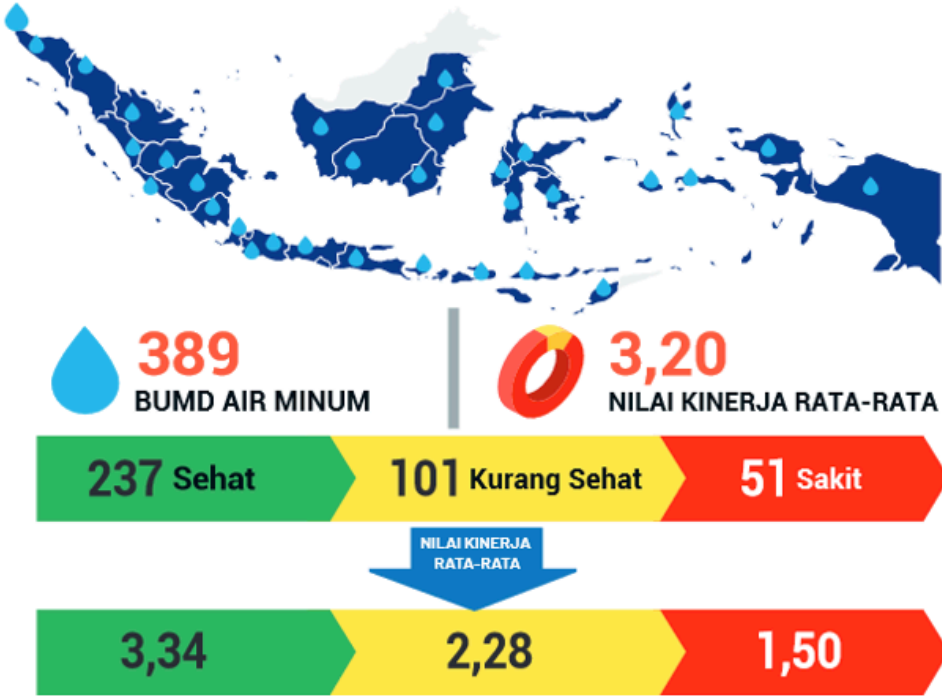


Figure 4. National Summary of BUMD drinking water performance in 2021

The performance results of drinking water perumda/perseroda show the extent to which the public is assured of safe drinking water consumption. Unhealthy or sick performance of perumda/ perseroda will have a major impact on the company's ability to provide safe drinking water

3. Our Efforts

Drinking water quality supervision cannot be separated from raw water treatment and supervision of the quality of ready-to-drink water consumed by the community. Various efforts have been made until the end of 2022, starting from efforts to meet drinking water needs both in terms of adequacy of quantity, quality, affordability and sustainability/continuity.

3.1 Safe Drinking Water Treatment Efforts

3.1.1 Technology Appropriate To use (Technology Appropriate To use)

Appropriate Technology (TTG) in drinking water treatment is the application of technology during the construction/development of drinking water facilities based on community needs according to conditions in certain areas. The main target of the application of appropriate technology for safe drinking water treatment is a communal-based drinking water supply system (SPAM).

The principle of drinking water treatment through the implementation of appropriate technology for drinking water is that SPAM is carried out with layered processing and security:

- a. Pay attention to the selection of water sources that will be treated (quantity, continuity, affordability, and quality).
- b. Protect the water source from physical, chemical and microbiological contamination.
- c. Ensure that the treatment is done correctly according to the selection of the appropriate technology.
- d. Protecting water after special treatment facilities and infrastructure (proper storage).

In an effort to accelerate the fulfillment of safe drinking water access in areas that have special and specific characteristics where it is difficult to reach access to safe drinking water, the application of Appropriate Technology (TTG) can be part of the effort to increase access to safe drinking water. Supervision of TTG is required from upstream to downstream, a risk management approach is needed in each business process implementation through efforts to implement the Drinking Water Safety Plan (RPAM).



Gambar 5. Pembangunan TTG Air Minum di Desa Kedungplang, Kabupaten Boyolali



Gambar 6. Pembangunan TTG Air Minum Desa Karyamukti, Kabupaten Cimahi



Gambar 7. Implementasi TTG di Desa Cinangsi, Kabupaten Sumedang

3.1.2 Padat Karya Tunai Desa (PKTD) Program, Implementation of Drinking Water Appropriate Technology

In 2022, the Directorate of Environmental Health held Padat Karya Tunai Desa (PKTD) program for the Implementation of Drinking Water Appropriate Technology for 20 villages in 12 districts / cities. The PKTD Drinking Water Appropriate Technology Implementation program is an effort to provide stimulants to other Regional Heads that are not the focus of this program and for them to be able to duplicate the program by implementing drinking water appropriate technology. This PKTD program provides various benefits to the community according to the needs and environmental conditions.



Head of the TTG Drinking Water Community Working Group (KKM) of Margamekar Village, Sumedang "This TTG has a big impact on the community. People can easily get access to drinking water and can make new connections"

The budget allocated for the PKTD program is Rp.100,000,000 per village, which is handed over directly to the community managers who form the Village Community Working Group (KKM). The budget includes 70% for physical budget, 25% for labor budget and 5% for administration and operation of the KKM. The target of this PKTD program is 35 households as beneficiaries in one village/Village/Kelurahan.



3.1.3 Optimization of Appropriate Technology (TTG) safe drinking water spread across Indonesia:

- **Water Treatment Technology (Batam)**

This TTG has a function to treat groundwater into clean water and drinking water that meets health requirements. The construction of this tool consists of a concrete building, has a water reservoir consisting of 7 units, UV lamps, main piping, filter piping, distribution piping, tub backwash piping, electricity and machinery.

- **Filter Removal (Combination of Treatment and Filtration of Borehole Water into Clean Water) (Medan)**

This TTG has a function to handle and provide solutions to the borehole water problem which contains high levels of iron, manganese and ammonia that the water produced is not yet suitable for consumption. This TTG uses a treatment process method using a removal filter consisting of an oxidation process and an absorption process.

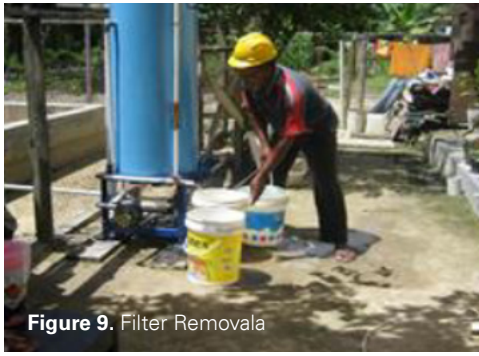


Figure 9. Filter Removal



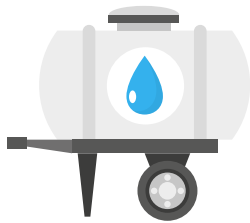
Figure 10. Tangki Penampungan Air Sumber



Figure 11. Tangki Penampungan Air Hasil Filter

3.2 Perumda/Perseroda Drinking Water Production Efforts

In serving the community, Drinking Water Perumda/Persoda seeks to provide the best service for the convenience of its customers to distribute the best water quality. Various efforts have been made, such as an attempt to reduce leaks by replacing pipes that are no longer suitable with pipes that are resistant to leaks, one of which is HDPE type pipes, expanding the pipeline network so that the community can reach access to piped drinking water, providing ready-to-drink water taps in public places such as parks, offices, schools, hospitals and other public facilities, providing locations such as drinking water depots managed by perumda/perseroda (for Tirta Asasta Depok perseroda called Asasta+) (Figure 12).



Drinking Water Perumda Tugu Tirta Malang:
“Our efforts are done by providing safe water service to households by using appropriate technology including pipelines to avoid corrosion.”



Figure12. Asasta+ Water Depot, Depok

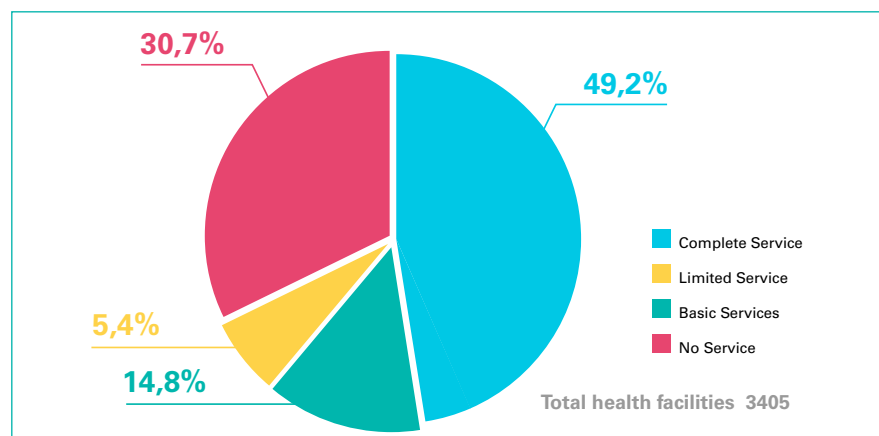


3.2.1 TFU Facilities and Infrastructure

Drinking water quality supervision is continuously being carried out in Public Facilities (TFU) which are places or facilities used for public activities such as markets, schools, health facilities (health service facilities, terminal, airports, stations, ports, cinemas, hotels and other public places). These public facilities can be declared healthy/suitable for use if they can fulfill various aspects of requirements consisting of physiological, psychological and can prevent disease transmission.

In 2022, nationally, 3405 health facilities have been recorded for the Water aspect. A total of 49.2% of health facilities have full services, 14.8% of health facilities have basic services, 5.4% have limited services and 30.7% of health facilities have no services.

Figure13. Water Aspect Data Percentage (Health Facility)



4. Drinking Water Quality Monitoring

4.1 Regulation

The Ministry of Health has a role in monitoring the quality of drinking water, both upstream and downstream at the household level. The Ministry of Health has had a Ministry of Health Regulation that regulates Drinking Water Quality Requirements as stated in the Ministry of Health Regulation No. 492/MENKES/Per/IV/2010 and regulates Drinking Water Quality Supervision Procedures as stated in the Ministry of Health Regulation No. 736/MENKES/Per/VI/2010.

Until the end of 2022, a review of drinking water quality control policies and regulations has been conducted. Starting from the development of the 2020-2023 national drinking water quality supervision roadmap to the review of regulations in the field of drinking water quality supervision,

including Ministry of Health Regulation No. 492 of 2010, Ministry of Health Regulation No. 736 of 2010 and Ministry of Health Regulation No. 32 of 2017 which were then summarized into one regulation that was stipulated at the beginning of 2023 in the form of Ministry of Health Regulation No.2 of 2023 concerning the Implementation of Government Regulation No. 66 of 2014 concerning Environmental Health together with other aspects in the scope of environmental health. As for the aspect of water quality supervision, there are 3 aspects stated in PMK No. 2 Year 2023, which are aspects of the Drinking Water Safety Plan (RPAM), aspects of RPAM Audit and changes in the number of mandatory and specific parameters as drinking water quality standards. Table 7 illustrates the changes in the contents of Permenkes No. 492 Year 2010 and Permenkes No. 736 Year 2010 into PMK No. 2 Year 2023.

Table 7. Regulation Ministry Health Republic Indonesia Which Arrange about Water Drink

<p>PERMENKES NO 2 YEAR 2023 ON REGULATIONS OF IMPLEMENTATION GOVERNMENT REGULATIONS NUMBER 66 OF 2014 ABOUT ENVIRONMENTAL HEALTH</p>	<p>MINISTRY OF HEALTH OF THE REPUBLIC OF INDONESIA REGULATION NUMBER 736/ MENKES/PER/VI/2010 YEAR 2010 ON DRINKING WATER QUALITY MONITORING PROCEDURES</p>	<p>PERATURAN MENTERI KESEHATAN REPUBLIK INDONESIA NOMOR 492/ MENKES/PER/IV/2010 TENTANG PERSYARATAN KUALITAS AIR MINUM</p>
<ul style="list-style-type: none"> • Arranged material in this Minister Regulations includes: <ol style="list-style-type: none"> 1. Quality Standards of Environmental Health and Health Requirements in water medium, air, soil, food, Facilities and Buildings, Vector and Disease Carrier Animals 2. Health Improvement Measures 3. Protection of Public Health Measures 4. Technical requirements of Waste Management Process and Health Service Facility's Waste Supervision 5. Vector Control and Disease Carrier Animals. 6. Procedures and efforts maintenance environmental health in condition and global threat change climate; and 7. Coaching and supervision procedures. 	<ul style="list-style-type: none"> • Monitoring activities of drinking water's quality includes: <ol style="list-style-type: none"> 1. Sanitary inspection done by observation and evaluation of the physical quality of drinking water and the risk factors. 2. Drinking water sampling based on sanitary inspection results. 3. Testing the quality of drinking water done in accredited laboratory. 4. Analysis of laboratory test results. 5. Recommendations for follow-up executions. 6. Monitoring follow-up executions. • In carrying out internal supervision, drinking water provides must execute a health risk analysis. • Sanitary inspection must be done through: <ol style="list-style-type: none"> 1. Determine the location point and sanitary inspection frequency. 2. Observation and evaluation for drinking water facilities by using sanitary inspection of drinking water facilities. 3. Set the risk level of pollution based on evaluation results. 	<ul style="list-style-type: none"> • This regulation controls the requirements of a healthy quality of drinking water. • This regulation controls the requirements of a healthy quality of drinking water. • Safe drinking water for health is water which meet the physics, microbiological, chemical and radioactive requirements stated in mandatory and additional parameters. • The mandatory parameters mentioned are the quality requirements of drinking water which must followed and obeyed by every drinking water provider. • The additional parameters can be set by the local government in accordance to environmental quality in each area by referring to the additional parameters as stipulated in this regulation.

- **Sampling drinking water must require as follows:**
 1. Determine the sampling location point based on sanitary inspection results.
 2. The sample points spread and represent the water quality of the drinking water supplier system.
 3. Samples are taken, stored to be sent in a sterile container and free from contaminations.
 4. Sample delivery is done immediately.
 5. The samples must be equipped with a detailed data of the samples and label.

- **Laboratory testing analysis results is done by:**
 1. Compare laboratory test results with drinking water quality parameters according to legislation.
 2. Identify the source of contamination.
 3. Do repairment steps.

4.2 Drinking Water Quality Monitoring Program and Household Drinking Water Quality Surveillance

Through the mandate stated in the Ministry of Health Regulation No. 736/MENKES/Per/VI/2010 on the Management of Drinking Water Quality Supervision. The Ministry of Health through the Provincial Health Office, District / City Health Office and Sanitarians at Puskesmas implements an external drinking water quality supervision program in order to answer the percentage indicators of the Ministry of Health's Strategic Plan 2020 - 2024 of drinking water facilities that are supervised / checked for drinking water quality according to standards.

The Household Drinking Water Quality surveillance program is also implemented in order to answer the RPJMN 2020-2024 target of 15% access to safe drinking water.

4.3 Recording and Reporting

The recording and reporting system for Drinking Water Quality Monitoring (PKAM) in 2022 is carried out using online-based media (google spreadsheet) arranged by the Directorate of Environmental Health and can be accessed by all District / City Health Offices in Indonesia. The PKAM data input into the reporting system is external supervision data carried out by Sanitarians at the Puskesmas on drinking water facilities.

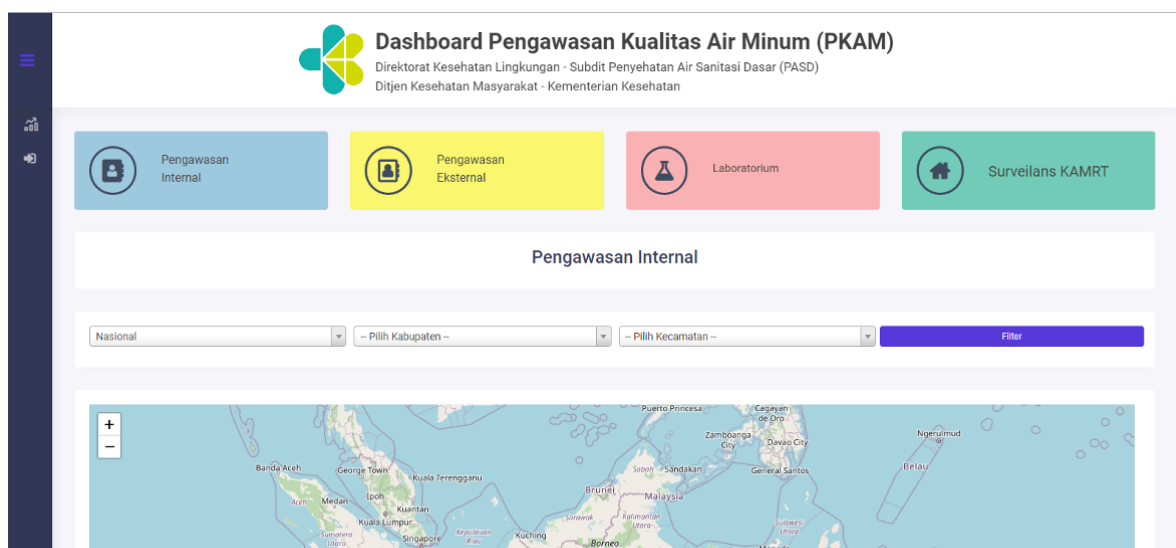
The PKAM reported data from Sanitarians at Puskesmas will be verified by the District Health Office before its put into the online-based reporting system. Reporting is carried out every 4 months or quarterly to achieve the percentage of achievement indicator numbers of Drinking Water Facilities that are Supervised / Inspected for Drinking Water Quality according to Standards.

Currently, the Ministry of Health of the Republic of Indonesia together with development partners (WHO) is developing an online application-based recording and reporting system (E-Monev) for PKAM. This E-Monev PKAM recording and

reporting system can produce a database in the form of internal supervision results which will be managed by each Drinking Water Provider / Operator, the results of external supervision managed by each Sanitarian Health Center and the results of laboratory networks that will be managed by laboratories included in the UPT of the Ministry of Health. E-Monev PKAM can also produce a database of the results of the implementation of Household Drinking Water Quality Surveillance (SKAMRT) activities to obtain safe drinking water access rates in households.

The role of the District Health Office and Provincial Health Office is to verify the data input by sanitarians at the Puskesmas. The District / City Health Office and Provincial Health Office also have a role in assisting drinking water providers in their fostered areas in conducting internal supervision, as well as assisting sanitarians when conducting external supervision and KAMRT surveillance. The PKAM online application-based recording and reporting system (E-Monev) is planned to be ready for use in March 2023.

Picture 14. Drinking Water Quality Monitoring Dashboard (PKAM)



4.4 Laboratory Network

One of the points of the strategic plans in the PKAM Roadmap is to improve the drinking water quality monitoring system through the implementation of integrated surveillance system strengthening strategies and the final strengthening of the integrated reporting system and the coordination from the Puskesmas level to the Ministry of Health on drinking water providers, health facilities, TFUs, and laboratories as well as the development of laboratory networks in drinking water quality monitoring.

The development of laboratory networks in drinking water quality supervision has action plans such as standardizing water quality testing methods and work procedures in laboratories, establishing a laboratory reference system for drinking water quality testing and developing a laboratory system in calibrating water test kits. The development of this laboratory network is expected to improve and support the supervision of safe water quality in Indonesia.

4.5 Budget Allocation in Supporting Drinking Water Quality Monitoring Program

In 2022, the Ministry of Health of the Republic of Indonesia has provided a special allocation in the menu of physical Special Allocation Funds (DAK) and non-physical Special Allocation Funds (DAK). The budget prepared by the Ministry of Health in an effort to accelerate the fulfillment of safe drinking water access is to support the drinking water quality monitoring program and surveillance of Household Drinking Water Quality (KAMRT).

The Ministry of Health provides budget support in the procurement of sanitarian kits which are the measurement tools to check the quality of drinking water. Sanitarian kit is one of the kits or measuring tools that is the main weapon for sanitarians to obtain data related to the quality of safe drinking water both at the facilities and the household points, including monitoring the quality of drinking water in public places and facilities. Since the year 2020, the Ministry of Health has provided a special budget in the Physical DAK to Puskesmas for the procurement of Sanitarian Kits. It is expected that 10,260 Puskesmas in Indonesia will have 1 sanitarian kit to support environmental health programs, especially in drinking water quality monitoring.

The Ministry of Health also supports Consumables (BHP) in this case are reagents for the examination of 19 parameters in accordance with the provisions in the Regulation Draft of the Ministry of Health on the Implementation of PP 66 of 2014 which is planned to be ratified in 2023. Reagents are prepared in order to support Household Drinking Water Quality surveillance activities in 334 Districts / Cities and 4,868 Puskesmas as KAMRT surveillance implementers. Other districts/cities that are not the focus of BHP provision by the center can use other budgets according to their respective regional budgeting capabilities.

The total budget prepared by the Ministry of Health for the provision of BHP reagents in support of the Drinking Water Quality surveillance program is Rp 99,716,112,000. The Ministry of Health also prepared a menu in the non-physical DAK to support the operations of sanitarians and assistants at the District / City and Provincial levels for Household Drinking Water Quality surveillance activities.





Figure 15: Seminar on Safe Drinking Water

5. Support

Support in the planning, implementation, monitoring and evaluation of drinking water quality supervision comes from internal support, in this case from the government both from the ministry of health and also across ministries and from local governments. On the other hand, external support comes from non-governmental organizations such as drinking water providers Peumda/Perseroda and international organizations such as WHO, UNICEF, USAID and others.

5.1 Internals

5.1.1 Socialization and Absorb Aspirations through Seminar as well as a Forum

On the way to a safe drinking water in Indonesia, the Ministry of Health of the Republic of Indonesia often organizes seminars both internally and externally with various participants for the supervision of drinking water quality in Indonesia as a joint effort to maintain the quality of drinking water. These seminars are organized in order to bring awareness the gravity to obtain safe drinking water to various groups of people.

5.1.2 Training HR as well as Budgeting on Government Center

Human Resources (HR) training for the executives in monitoring drinking water quality supervision in every region in Indonesia who are sanitarians need to be considered and fully supported by the Central Government. This is an effort to increase the capacity of officers related to safe drinking water with the aim that sanitarians or environmental health officers are able to carry out environmental health inspections at drinking water facilities.

5.1.3 Commitment local government in realize Perumda/Perseroda Which Healthy

A strong commitment from the District or City Government to nourish Perumda/Perseroda is greatly needed, because there are still Regents or Mayors who have not fully supported drinking water companies in their regions such as low capital participation, lack of regulatory support in the form of Regional Regulations (Perda) and Regent/Mayor Regulations that support company operations, one of which is in determining rational drinking water rates above the price of water production but within a reasonable level so that there is company profit that can be used for community services in fulfilling safe drinking water.

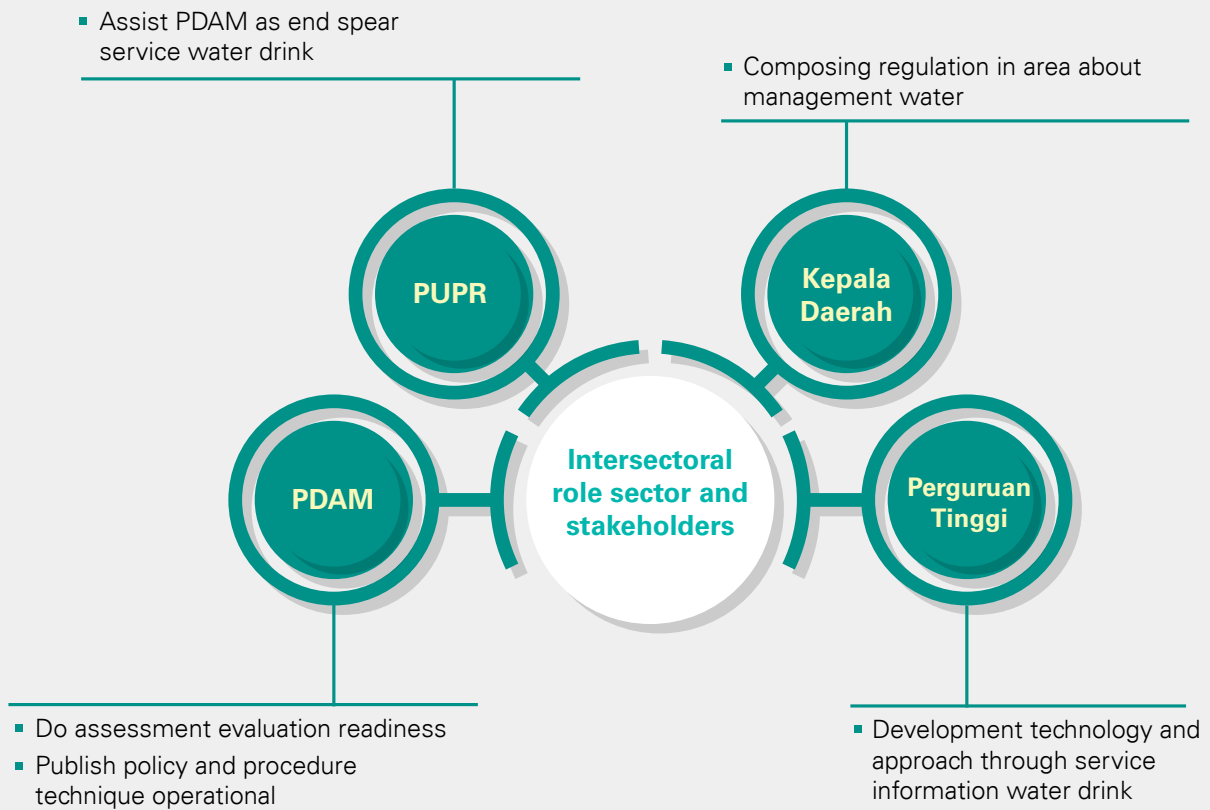
Picture 16. Strategic Scheme Reaches 100% Healthy PDAM



Source: System Management Knowledge

5.1.4 Ministry and Stakeholders

Picture 17. Role Between Sector and Stakeholders



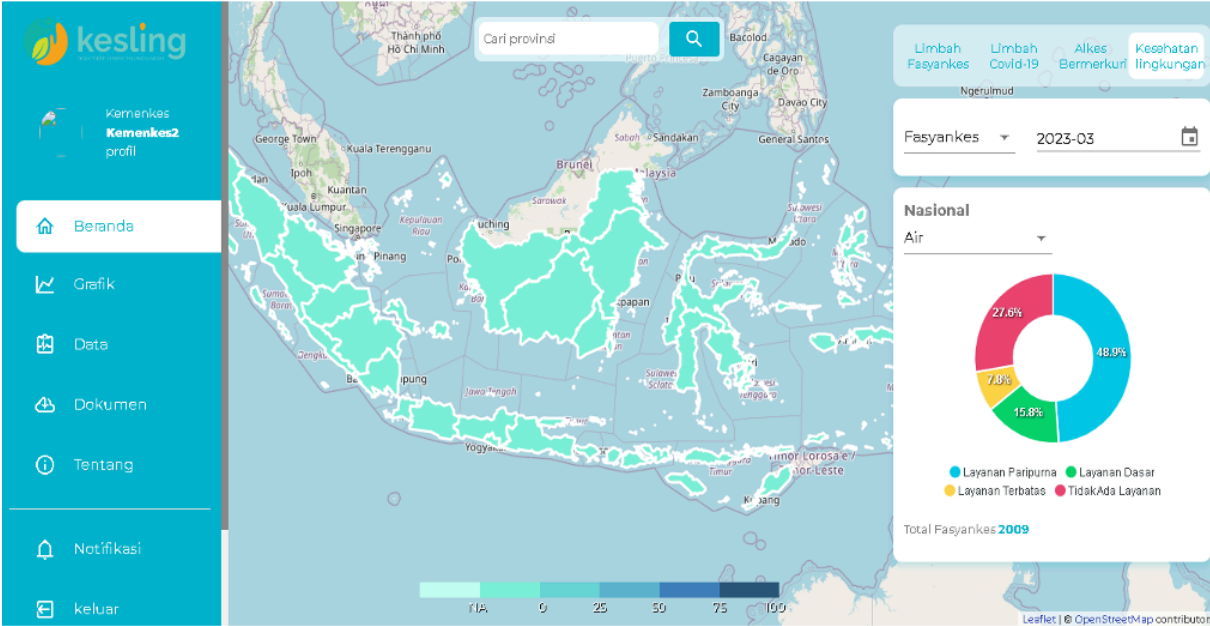
There are various contribution roles from many parties such as the Ministry of PPN/Bappenas in the planning of drinking water quality and other programs, the Office of Public Works and Spatial Planning related to PAM water and piped drinking water access and the Ministry of Home Affairs, PAMSIMAS PUPR, universities and research. Local government from allocations in sanitation. Safe drinking water achievement indicators which are based on drinking water as defined by Bappenas. Implementation of drinking water quality is done in districts and cities annually. Increasing the capacity of natural resources from human resources in improving facilities, tools and materials for inspection as well as reporting system. Part of the needs prioritized roadmap from 2023-2024.

5.2 Externals

5.2.1 Development Partners

Support from external development partners such as Perumda/Peroda, WHO, Unicef and USAID is essential to support Indonesia in achieving safe drinking water targets. WHO until the end of 2022 supported in the development of a roadmap for drinking water quality monitoring and in the review and preparation of RPAM audits and safe drinking water quality parameter studies. Another program of the development partners is Wash Fit in health facilities. Wash Fit is a method to improve service quality that is used by facilities to identify areas for improvement and take corrective actions. Based on the wash profile at Puskesmas 1 out of 5 Puskesmas does not have access to suitable water and 1. The status of the National Wash service will later be reported as an achievement of SDG 6 and 3 in Sikelimkes.

Picture 18. Sikelimkes



6. Closing

6.1 Challenges

6.1.1 Lack of Support from Government

One of the factors for the availability of safe drinking water is the provision of basic infrastructure, supervision and the availability of human resources. One that needs special attention from the government is drinking water infrastructure in various residential and urban areas. Problems that often arise are often found that the lack of infrastructure and the quality of groundwater and rivers used by the community do not meet the requirements.

Infrastructure for drinking water needs to be balanced with the growth rate of society in Indonesia so that every Indonesian have access to safe drinking water. Access to drinking water infrastructure, especially in rural areas, is still not maximized and its maintenance is not adequate. The provision of drinking water infrastructure requires various supports from various parties, especially the support of the Government. It is hoped that in the future the Government both at the Central and Regional levels will pay more attention and build infrastructure for drinking water in order to achieve an improved public health by allowing safe drinking water access to the people.

6.1.2 Build Integrated Drinking Water Data

The reporting and recording system of drinking water quality monitoring (PKAM) is one of the most important tools as a basis for planning the development of access to safe drinking water. Good data quality is expected to describe the real conditions in the field on the drinking water quality up to the household level which still has not reached the national target.

Drinking water quality monitoring data has not been integrated with other Ministries and Institutions such as the Ministry of Public Works and Public Housing which has a role in providing safe drinking water facilities and infrastructure. The need for integration in building safe drinking water data is one of the challenges for the Ministry of Health to be able to provide data that can be the basis for policy creators in determining the next strategy.

6.1.3 The Demand of Academics Institution's Role and Researcher

The role of academic institutions and researchers, especially for drinking water in Indonesia, can improve the community's health concerning various aspects such as social, economic and public service aspects. The role of academic institutions and researchers can provide an understanding of the potential identification, problems and action plans of community-based safe drinking water problems in Indonesia which then plan follow-up with policy creators, Non-Governmental Organizations (NGOs) related to community-based drinking water provision.

6.1.4 Geographical Condition in Indonesia

Based on its geographical location, Indonesia is located on the Asian Continent and the Australasian Continent and between the Indian Ocean and the Pacific Ocean. This is related to Indonesia's climate. Indonesia is geographically located in the monsoon region, which is a natural phenomenon where extreme climate change is very frequent, this is caused by changes in air pressure from land. These climate changes will cause the "Jet Steam Effect" which comes from the ocean and blows the land with heat. The heat, accompanied by the wind, makes many areas that originally had water content to dry and it can worsen if the dry season arrives.

In addition, the drought that occurs in Indonesia can also be caused by climate change factors that make it rain less often. The low rainfall is caused by low levels of water vapor production and clouds, which causes the dry season to become longer and drought will hit.

6.1.5 Strengthening Power Source such as Equipment and Materials

Strengthening adequate equipment and materials in all districts in conducting drinking water quality monitoring is a factor in creating health status, where strengthening the resources of equipment and materials is essential in addition to community behavior issues.

6.1.6 Planning and Budget Optimization

The Ministry of Health, along with related Ministries/Institutions and Local Governments have a special budget in an effort to accelerate the development of access to safe drinking water. The Ministry of Health has allocated a budget in the physical and non-physical Special Allocation Funds (DAK) menu in supporting efforts to accelerate the fulfillment of safe drinking water access in order to also support drinking water quality monitoring programs and surveillance of Household Drinking Water Quality (KAMRT).

In budget planning, not all regions at both the provincial and district/city levels have prioritized a special budget in accelerating the fulfillment of access to safe drinking water. The use of the previously allocated budget has also not been fully targeted. Fulfillment of access to safe drinking water is the role of many parties, especially the local government as the highest leader in their respective regions. Budget allocation planning in an effort to accelerate the fulfillment of access to safe drinking water is expected to be a priority considering that the need for drinking water is a basic need that should be a right for all levels of society.

The budgeting at both the Local Government and Central Government levels, as well as related Ministries/Institutions is the main thing in optimizing the acceleration of safe drinking water access development. The use of the right target is a special challenge in order that the acceleration of the development of access to safe drinking water becomes more focused in achieving the target.

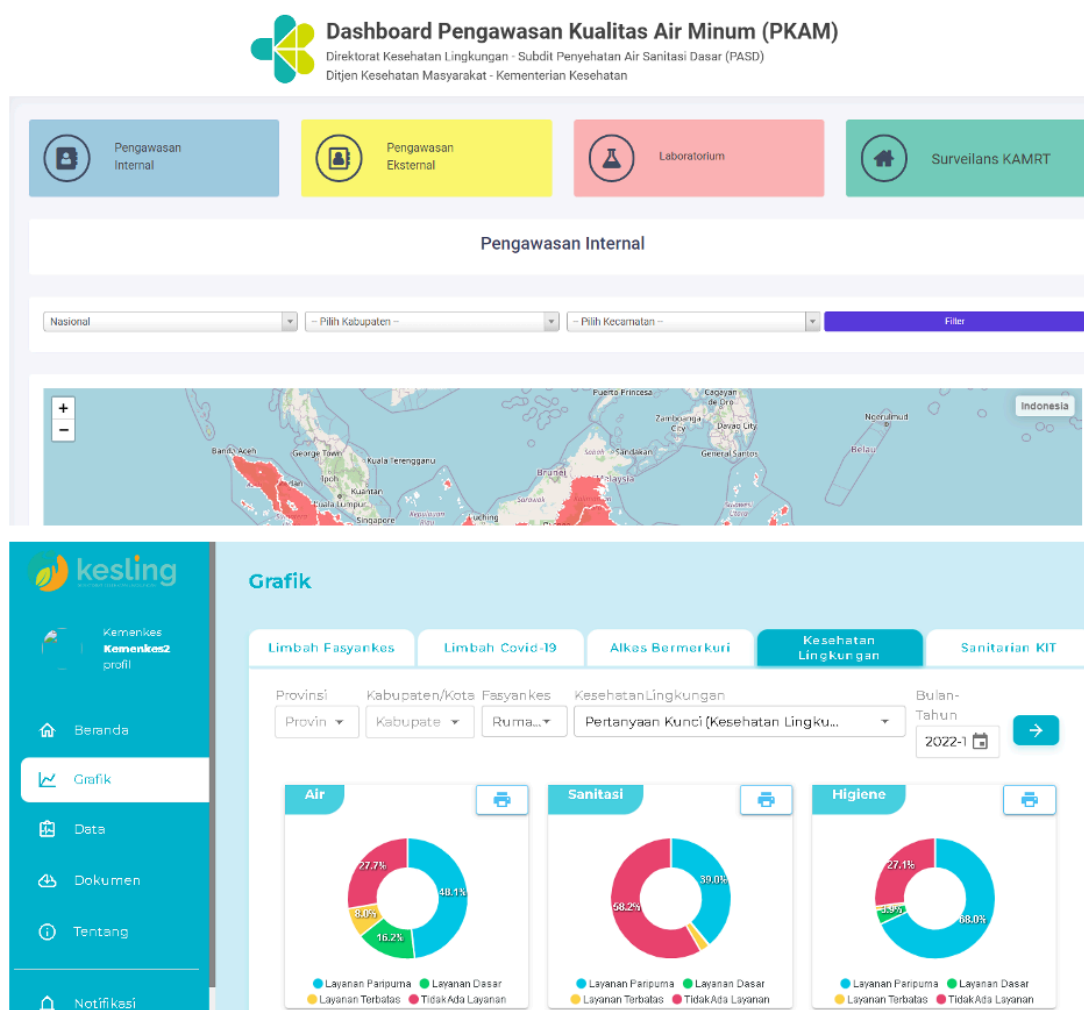
6.2 Recommendation

6.2.1 Online System Recording and Reporting Development (E-Monev)

efforts are needed by the Central Government, Local Governments, and related Ministries/ Institutions in drinking water quality monitoring. Beyond that, water supply providers and non-governmental organizations can also play a role in accelerating efforts to fulfill access to safe drinking water.

One of the important measures in determining the development strategy for accelerating access to drinking water is to obtain integrated data. The development of the PKAM Online Application-Based Recording and Reporting System (E-Monev) is one of the recording and reporting applications for monitoring drinking water quality owned by the Ministry of Health. The Ministry of Health also has the SIKELIM application that can record and describe WASH (Water, Sanitation and Hygiene) in health facilities.

Picture 19. Reporting and Recording System, E-Monev PKAM and SIKELIM



Beyond this matter, the recording and reporting system is expected to be integrated with other Ministries / Institutions in order that the quality of obtained data can be optimal, not only related to supervision and quality carried out by the Ministry of Health, but also can be integrated with programs from the Ministry of Public Works and Housing, Ministry of National Development Planning / Bappenas, Ministry of Home Affairs, Ministry of Villages, Development of Disadvantaged Regions and Transmigration and programs from other Ministries / Institutions related to the provision of access to safe drinking water.

Reference

- Office of The United Nations High Commissioner for Human Rights. (2022). *About water and sanitation OHCHR and the right to water and sanitation*. United Nations Human Rights. <https://www.ohchr.org/en/water-and-sanitation/about-water-and-sanitation>
- SDG. (2015). Goal 6: *Ensure access to water and sanitation for all*. Sustainable Development Goals. [www-un-org](http://www.un.org)
- Zumdahl, S. (2022). *Water*. Britannica. <https://www.britannica.com/science/water>
- Desrah, Noviasari, R., Lestari, J., & Amelia, E. (2022). *BUKU KINERJA BUMD AIR MINUM 2022*.
- AMPL, P. (2013) *Rencana Pengamanan Air Minum (RPAM), POKJA AMPL*. Available at: [http://www.ampl.or.id/program/Rencana-Pengamanan-Air-Minum-\(RPAM\)-/24](http://www.ampl.or.id/program/Rencana-Pengamanan-Air-Minum-(RPAM)-/24).
- Asni, M. and Ilfan, F. (2021) *Penerapan Teknologi Tepat Guna CCBN5651 Untuk Penyediaan Air Bersih Masyarakat Daerah Gambut Kecamatan Sungai Gelam Muaro Jambi, Universitas Jambi*. Jambi. Available at: <https://www.unja.ac.id/penerapan-teknologi-tepat-guna-ccbn5651-untuk-penyediaan-air-bersih-masyarakat-daerah-gambut-kecamatan-sungai-gelam-muaro-jambi/>.
- Gunarto, G. *et al.* (2022) 'Penerapan Teknologi Tepat Guna Alat Penjernih Air Model Filtrasi Pada Panti Asuhan Amal Jariah Sekunder C Kecamatan Rasau Jaya Umum Kabupaten Kubu ...', *Jurnal Buletin Al ...*, 19, pp. 170–177. Available at: <http://openjurnal.unmuhpnk.ac.id/index.php/AL-R/article/view/4510>.
- Herschy, R. W. (2012) 'Water quality for drinking: WHO guidelines', *Encyclopedia of Earth Sciences Series*, pp. 876–883. doi: 10.1007/978-1-4020-4410-6_184.
- Inpres (2001) 'INSTRUKSI PRESIDEN REPUBLIK INDONESIA NOMOR 3 TAHUN 2001 TENTANG PENERAPAN DAN PENGEMBANGAN TEKNOLOGI TEPAT GUNA PRESIDEN REPUBLIK INDONESIA'. Jakarta, p. 5. Available at: <https://legalitas.org/instruksi-presiden-no-3-tahun-2001-tentang-penerapan-dan-pengembangan-teknologi-tepat-guna>.
- Permenkes RI (2021a) 'HASIL PENELITIAN STUDI KUALITAS AIR MINUM RUMAH TANGGA DI INDONESIA', pp. 1–30.
- Permenkes RI (2021b) *Panduan Audit RPAM*. Jakarta.
- Roslan, R., Damalia, F. P. I. and Mirasa, Y. A. (2022) 'Teknologi Tepat Guna Portable Chlorinator Pada Sistem Penyediaan Air Komunal Pedesaan', *Ikesma*, 18(2). doi: 10.19184/ikesma.v18i1.27148.
- WHO (2022) *Drinking Water, World Health Organization*. Available at: <https://www.who.int/news-room/fact-sheets/detail/drinking-water>.

