RESOURCES GUIDE

Behaviour change package: supporting the transition from self-supply to piped water supply systems in urban Indonesia

Co-developed by Universitas Indonesia and University of Technology Sydney—Institute for Sustainable Futures

Overview

Transitioning to centralized piped water systems in densely populated urban areas is a crucial pathway to achieve **equitable access to safely managed, resilient water, sanitation, and hygiene (WASH) services** in low- and middle-income countries (LMICs). In Indonesia 19.76% of urban households are connected to a centralised piped water system (BPS, 2023). Many households privately own and manage their source of water (referred to as 'self-supply'), as has been the case for centuries. While self-supply can provide households with safely managed water, the ever-increasing water demand, compromised water quality and lack of monitoring and regulation of groundwater use, presents several risks. In contrast, **centralised piped water systems in urban areas have potential to provide efficient, economical services to large populations.** In urban areas where infrastructure and coverage of piped water already exists, households need to be encouraged to connect to the centralised system and utilise this supply system for domestic water needs. To achieve the Government of Indonesia mid-term development plans and safely managed drinking water roadmap (Bappenas, 2024), which include significantly increased piped water connections, **behaviour change interventions are an important strategy to support households' transition to use piped water.**

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RECHARGE
Resilience in a Changing Climate: Advancing Research on Groundwater for Equity

BAPPENAS
Kementerian Perencanaan Pembangunan Nasional/
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An **international team** of researchers from Universitas Indonesia and University of Technology Sydney (UTS) Institute for Sustainable Futures have developed an **evidence-based behaviour change intervention (or 'package')** to support households in urban Indonesia transition from private wells or bores to centralised piped water supply as a more safely managed, climate-resilient water supply (Figure 1). Behaviour is anything we do. Behaviour change occurs when someone is faced with a familiar situation and does something new or different.

This resource guide provides background to this behaviour change package and is intended to orient implementation partners (and others) on the campaign rationale, basis and resources. As such, **this document synthesises information on the need for behaviour change, the evidence findings that inform the campaign, the five key resources that constitute the behaviour change package, and proposes implementation partners and ideas for their effective implementation**. This work has been funded by the Australian Government's 'Water for Women' program.

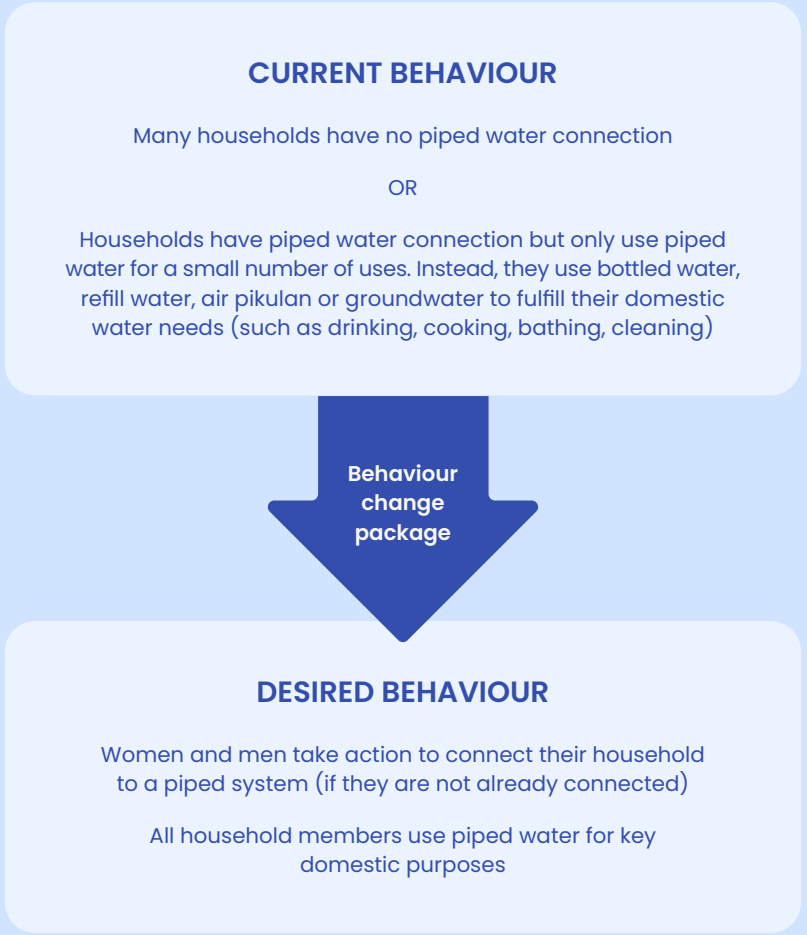


Figure 1. This behaviour change package aims to bridge the gap between current behaviour observed in urban Indonesia and the desired behaviour that achieves increased connections and use of centralised piped water.

Introduction

There is limited knowledge about how to influence women and men's behaviours to ensure choice of the most safely managed, climate-resilient water sources. Typically, health-based messages, information and education are used, but often have limited effectiveness. To understand complex decision-making processes, methodologies such as a **behaviour-centred design (BCD) approach** are important, as they focus on the **underlying human motives that drive decisions.**

In this work, a BCD approach has been used to develop a **behaviour change package** that supports urban populations in Indonesia use piped water, by strategically targeting human motivations that inform decision-making about water sources, identifying interventions and building a suite of behaviour change campaign resources.

Unlike many other countries with emerging economies, **piped water usage in urban areas of Indonesia is low.** Households in Indonesia supplying their own water commonly do so from groundwater sources, mostly in the form of boreholes and protected dug wells (Foster & Gonzalez, 2022). **Groundwater, particularly in urban areas, is vulnerable to contamination** and therefore carries health risks. Excessive use also may contribute to **aquifer depletion** and **exacerbate water scarcity** and **land subsidence**, as is the case in Jakarta. Both of these issues may be exacerbated by **climate change impacts**. Moreover, this self-supply of water often **lacks regulatory oversight** and **proper water treatment** (Priadi et al., 2024). In the context of these challenges, **centralised piped water systems can offer significant advantages.** In addition to being a matter of immediate convenience, centralised piped water systems can:

- Facilitate the treatment and monitoring of water quality, with opportunity to ensure water meets safety standards and therefore reduce the incidence of waterborne diseases.
- Support reduced burden on women who commonly manage household water matters
- Strengthen economic efficiency and productivity, by supporting PDAMs to have sufficient customer basis and income to provide a reliable water supply to households, industries and tourism

However, many households still choose to use household wells and boreholes rather than piped water connections. Accordingly, this behaviour change package has been developed based on an investigation of key motivations influencing household water source choice, and a multi-stakeholder workshop to develop a campaign concept based on addressing these motivations.

The **transition to piped water systems is a strategic step towards higher water service levels, long-term sustainability and economic development in low and middle-income countries**. While acknowledging the limitations of piped water supply at present in Indonesia, including limited coverage and high non-revenue water in some locations, **significant improvements have been recently made in piped water infrastructure**, particularly in urban areas. There now exists a **behavioural lag** among urban households who are not yet connected or do not fully utilise existing centralised piped water services for drinking and other domestic purposes.

A behaviour change package (Figure 2) and associated 'theory of change' has been developed using a globally accepted approach (BCD) to address this behavioural lag among urban households. The behaviour change package comprises of five resources.

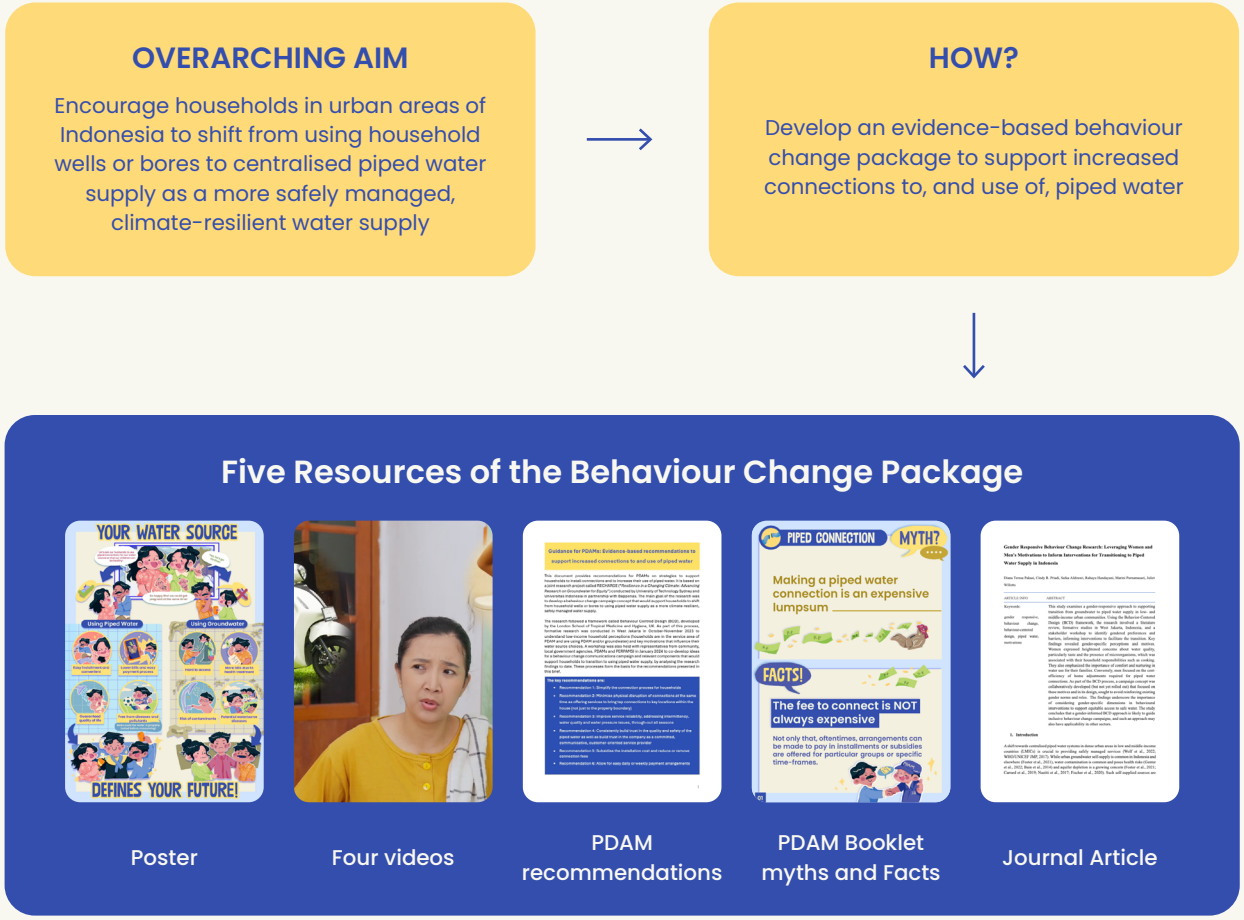
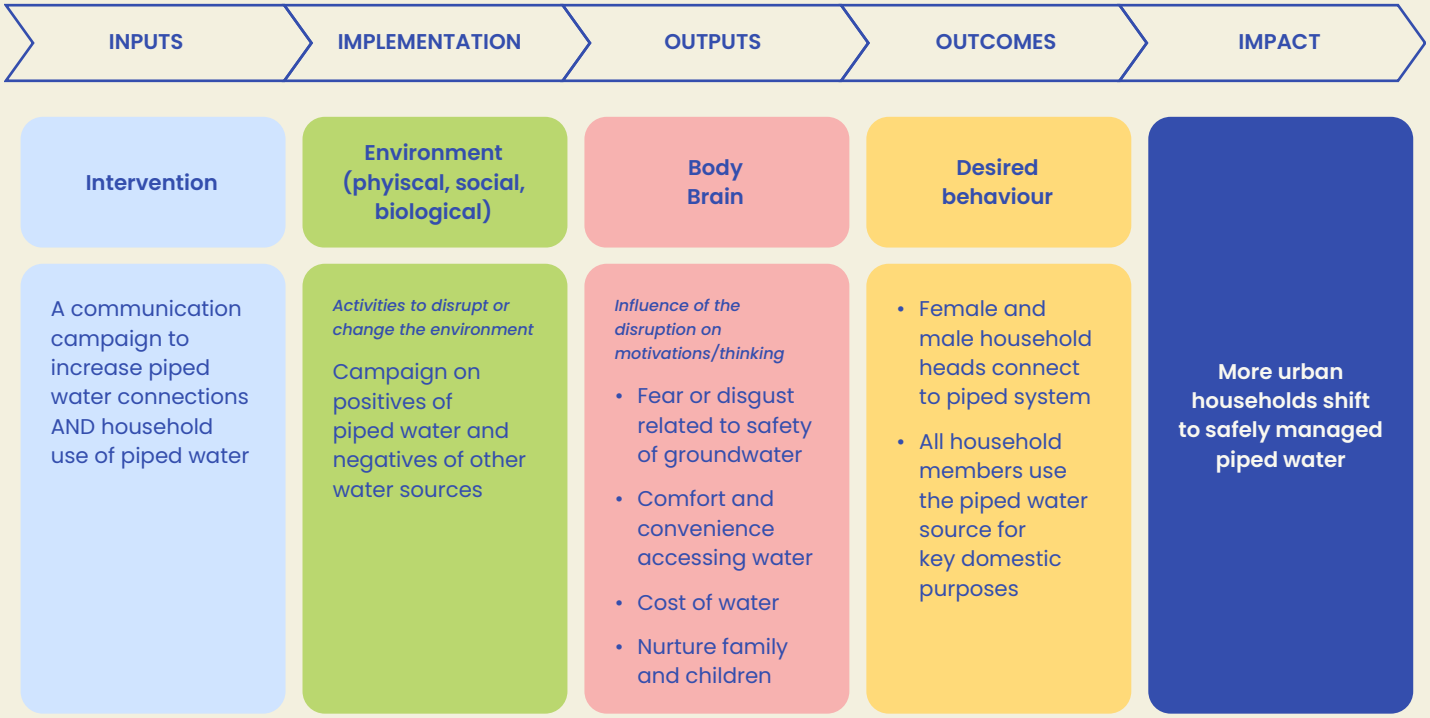


Figure 2. Overview of the rationale and resources comprising the behaviour change package

Evidence-base for the behaviour change package

Key principles of the BCD approach guided this behaviour change package. BCD focuses on understanding **human motivations** that underpin an existing or desired behaviour. These include drives related to the human body (comfort, hunger, fear, disgust and lust), emotions related to the social environment (nurture, attraction, love, affiliation, status, creating, hoarding, justice) and the brain's interests (curiosity and play) (Aunger & Curtis, 2016). Based on these motivations and thinking, BCD identifies ways to **disrupt the existing behavioural setting** (the physical, social and environmental context in which a behaviour takes place), acting on both the **body and the brain**, to instigate a new behavioural pattern. This strategy is encapsulated in a 'theory of change' (see Box 1).



Box 1. Theory of change developed to shift urban households from self-supply to piped water supply (based on assess, build and create phases of BCD methodology).

The **theory of change** for this behaviour change package was developed through the application of the BCD steps of assess, build and create, described further below. The behaviour change package **targets the current situation that many households have no piped water connection or, where they have a connection, they only use piped water for a small number of uses.** The research identified the relevant motivations to be **fear, disgust, comfort and nurture**, and their relevance to how people think about the **cost of water** supply. The theory of change shows how the implementation of the behaviour change package or campaign **focuses on the positives of piped water and negatives of other water sources** in relation to these motivations, and includes thinking that aims to disrupt the physical, social and biological context for water supply choices in the home.

The BCD approach provides a five-step process to develop and test behaviour change processes. The research methodology underpinning the theory of change and behaviour change package followed the first three steps, **'assess', 'build', and 'create'**, of the five-step BCD process. The subsequent steps covered in the BCD process are to 'deliver' the package and 'evaluate' its effectiveness, which are beyond the scope of this document.

BCD applies a comprehensive framework that considers:

- the **brain** (how people think and drivers of behaviour)
- **body** (traits, physiology and sense)
- the **environment** (wider physical, biological and social context)
- **behaviour setting** (the 'stage' where the behaviour takes place and the roles and routines that exist within that).

A Assess

The **'assess'** phase in the BCD used a literature review from global and Indonesian literature to compile available evidence against the BCD framework. In this phase, information was synthesised about information was synthesized about household water source choices, water source preferences based on gender, and the reasons for these preferences in Indonesia and globally. Knowledge gaps were also identified. Notable findings of the **'assess'** phase include:

People tend to follow established patterns of water source use. Once piped water is introduced, new habitual behaviours need to be developed. Habitual behaviours include household heads regularly using piped water for cooking and other domestic tasks. Making piped water more convenient and accessible could encourage people to establish new patterns of habitual behaviour, as would having key role models in households and communities endorsing and supporting the broad use of piped water.

Connection fees are a major barrier for people to use piped-water. Subsidies and payment instalments support greater access, however these incentives need careful marketing and communications targeting to reach low-income households and achieve their intended effect.

The common factors in choosing one water source over another include price, proximity, quantity or availability and water pressure. Colour, smell, taste, and perceived health risk also play a role, as does trust in water service provider. The level of education and hygiene awareness of populations also contributed to water source selection.

B Build

The **'build'** phase in the BCD involved formative research in a low-income community in Jakarta. People's water source decisions were influenced by multiple interconnected factors, such as how they think, their motivations, their physical needs, broader environment as well as their immediate context.

Cost perceptions vary widely, with mixed views about the relative expense of both piped and groundwater sources. Reliability is another key concern, though opinions differ on which water source is more dependable. Several barriers deter people from connecting to piped water, including complicated connection processes, installation complexities, service reliability concerns, and high costs. These barriers can be both actual and perceived.

Physical needs vary among different groups—older people and people with disabilities prioritise easy access, while women particularly focus on water taste for cooking. Quality preferences include clear, odourless water, with a common aversion to turbid, cloudy water or a chlorine smell.

Motivations driving water source choices include basic needs (hunger/thirst), emotional factors (fear of poor service, disgust towards poor quality water), practical considerations (comfort and convenience), social aspects (status associated with each water source, for example, piped water is for high-socio-economic groups), and family care (nurturing the health of family, particularly babies and people with disabilities). Social influence plays a role, with people often following community leaders' examples.

Environmental factors also shape choices: physical constraints (house location, alley size), biological considerations (water contamination levels and the extent to which it needs treatment), and social elements (trust in providers, religious beliefs, community relationships). Local leadership (such as RT heads) can significantly influence community choices.

The **immediate context** matters too, with practical considerations like meter placement affecting decisions. Women typically manage household water decisions, making them key stakeholders in water source selection.

C Create

In the **'create'** phase, these perceptions and motives were discussed through a multi-stakeholder two-day workshop to move from finding generation to insight generation, selecting key motives to be used in the behaviour change campaign concept and components. The workshop participants included community participants and leaders from the 'build' phase, selected water utilities, the national water utility association as well as government staff from health agency. A communications expert and illustrators supported the process. Collectively, this process provided the evidence to inform the behaviour change package and led to the 'create' phase. Throughout the 'assess', 'build', and 'create' phases, a gender equality, disability and social inclusion perspective was used.

Multi-stakeholder workshop held in January, 2024 at Universitas Indonesia, Jakarta. Photo credit: Juliet Willetts (UTS-ISF)

Resources in the behaviour change package

The table below summarises the five key resources comprising the behaviour change package. Given the varied nature of the resources, each has specific goals and implementation partners. Collectively, proposed implementation partners include (but are not limited to):

- PERPAMSI (Association of Indonesian Drinking Water Companies),
- PDAMS (Indonesian regional water utility companies),
- Health professionals (namely, the Provincial Health Offices, Puskesmas, sanitarians and health promotion officers) and
- Non-Governmental Organisations (NGOs) involved with water, sanitation and hygiene (WASH) programs in urban areas.

The behaviour change package is also relevant to researchers concerned with the behavioural aspects of WASH and the wider WASH sector in Indonesia.

RESOURCE	DESCRIPTION	GOAL OF THE RESOURCE	PROPOSED IMPLEMENTATION STRATEGY AND PARTNERS
Poster  Poster in bahasa Poster in english	This poster illustrates two contrasting pathways of life that unfold for a young child following their family's decision to drink piped water or drink hand-pumped groundwater. Life unfolds with health and success for the child who drinks piped water, while life unfolds with sickness and struggle for the child that doesn't.	The goal of the poster is to illustrate that the choice to use piped water in the household supports families to reduce their water costs, nurture healthy and successful children protected from risks and dangers of poor water quality and achieving higher social status. These concepts are aligned to human motivations to nurture families and children, and also incorporates other motivations that are expanded in the side-story short videos about these characters (below).	Strategic locations for displaying posters: • Community Centers (Balai RW, Posyandu/Poswindu) • Healthcare Facilities (Puskesmas) • Schools • Markets and Shops • Places of Worship • Public Transportation Hubs • PDAM offices Proposed implementation partners: • Health professionals (namely, the Ministry of Health and local health agencies) • NGOs involved with water, sanitation and hygiene (WASH) programs in urban areas

RESOURCE	DESCRIPTION	GOAL OF THE RESOURCE	PROPOSED IMPLEMENTATION STRATEGY AND PARTNERS
Four short videos  Based on key sub-stories connected to the characters and narrative of the main poster Video appealing to convenience Video appealing to cost-efficiency Video appealing to nurture Video appealing to health	Four short videos expand on the narrative and characters explored in the main poster. Each video tells a simple narrative that focuses on a core motivations that might encourage an individual or household to connect to a centralised water supply, or use piped water for more domestic purposes. The videos feature real people and places, effectively grounding the behaviour change intervention to the local context. The video format is highly entertaining and shareable.	The goal of these short videos is to demonstrate diverse scenarios where connecting to, and using piped water in the home, leads to overall positive life outcomes. The key messages captured in these storyboards are aligned with core human motivations identified through our formative research. The videos demonstrate that when people use piped water, they will be: 1. comfortable (convenient) 2. cost-efficient (save money) 3. healthy and thriving (nurture loved ones, and avoid danger) 4. protected from the risks of contaminated groundwater (nurture loved ones, avoid sources of contamination, avoid danger).	Videos will be shared online on various platforms including YouTube, Instagram and TikTok. Proposed implementation partners who might upload and circulate the videos include: • Health professionals (namely, the Ministry of Health and local health agencies) • NGOs involved with water, sanitation and hygiene (WASH) programs in urban areas Posters with QR codes linked to the videos could be displayed in strategic locations to increase community exposure and viewing.
Recommendations for PDAM  Bahasa English	An 11-page document that provides six key evidence-based recommendations to PDAMS on strategies to support increased household connections to and use of piped water.	The goal of this document is to build knowledge and capacity of PDAMS to improve their processes and reduce barriers for households to connect to, and use piped water.	This document could be circulated by PERPAMSI to PDAMs, as well as incorporated into PERPAMSI training days. • PERPAMSI • PDAMs • NGOs involved with water, sanitation and hygiene (WASH) programs in urban areas

RESOURCE	DESCRIPTION	GOAL OF THE RESOURCE	PROPOSED IMPLEMENTATION STRATEGY AND PARTNERS
Booklet for PDAM: myths and facts about piped water  Bahasa English	A highly visual 10-page booklet that lays out common myths and misperceptions that individuals might hold towards piped water that might be disincentivizing them from connecting to piped water. The facts that counter these myths are also outlined. The booklet includes illustrations that visually link to the characters depicted in the main poster	The goal of this booklet is to build knowledge and capacity of PDAM staff to better navigate discussions with households who they hope will transition to piped water.	This document is intended to be used directly by PERPAMSI and PDAM staff working in promotions and customer or community engagement, as well as incorporated into PERPAMSI training materials. • PERPAMSI and PDAMs • NGOs involved with water, sanitation and hygiene (WASH) programs in urban areas • Women's cadre, monthly checking with posyandu, children • Local health agency • Local leaders
Journal article 	This journal article has the working title of 'Gender Responsive Behaviour Change Research: Leveraging Women and Men's Motivations to Inform Interventions for Transitioning to Piped Water Supply in Indonesia'.	The goal of the article is to demonstrate the credibility and legitimacy of the research evidence base on which the behaviour change package is based, and provide deeper insight into the gender and inclusion aspects of this behaviour change work.	• Researchers concerned with the behavioural aspects of WASH • Wider WASH sector in Indonesia This document could be circulated through national conferences.

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Reference List

Aunger, R. & Curtis, V. (2015). A Guide to Behaviour Centred Design (Draft). https://www.lshtm.ac.uk/sites/default/files/2017-03/BCD%20Guide.pdf

Badan Pusat Statistik (BPS). (2023). National Socioeconomic Survey (SUSENAS). https://jdih.bappenas.go.id/data/peraturan/2024seppn001.pdf

Foster, T. and Gonzalez, D. (2022). Self-supply of water in Asia and the Pacific: Country Profiles. Sydney: UTS. https://www.uts.edu.au/sites/default/files/2023-09/Self-supply%20in%20Asia%20and%20the%20Pacific%20country%20profiles.pdf

Kementarian PPN/Bappenas & UNICEF. (2024). Rencana Teknokratik Peta Jalan Induk: Air Minum Aman Indonesia. https://www.unicef.org/indonesia/media/20861/file/Rencana%20Teknokratik%20Peta%20Jalan%20Induk%20Air%20Minum%20Aman%20Indonesia.pdf

Priadi, CR, Suleeman, E, Darmajanti, L, Putri, GL, Genter, F, Foster, T & Willetts, J. (2024). 'Policy and regulatory context for self-supplied drinking water services in two cities in Indonesia: Priorities for managing risks', *Environmental Development*, vol. 49, p. 100940.