Challenges and efforts for sanitation access growth in Indonesia

T Tarlani*, H Nurhasanah and A T Destiani

Department of urban and Regional Planning, Bandung Islamic University Jalan Tamansari No. 1, Bandung, Indonesia

*tarlani@unisba.ac.id

Abstract. Urban society’s health is directly affected by environmental factors where the quality of the environment is decided by the development of urban infrastructure. Exponential growth of population in Metropolitan Cities without being matched by basic sanitation supplies will raise the deteriorating environmental conditions. Bandung metropolitan city has a high level of urbanization so that the problem of basic sanitation supply is more important. This study aims to identify sanitation problems and efforts to improve access to basic sanitation in Bandung city. This research method uses a deductive approach with quantitative and qualitative mixed analysis methods. The use of data in this study uses secondary data from the past 5 years. Our initial synthesis shows that the main problems of access to basic sanitation in Bandung are caused by technical constraints in the form of lack of suitable land and limited access to the PDAM sewer, while non-technical constraints in the form of readiness and understanding of local urban society, and budgeting. The efforts of Bandung city are currently quite massive, but the improvement of sanitation access is still not significant.

1. Introduction
Sanitation is a basic human need in creating a healthy environment and society [1]. The UN has agreed in the SDGs that by 2030, total access to sanitation is targeted to reach 100%, as well as 0% slum area and 100% access to improved drinking water [2]. This is due to the many diseases that arise due to poor sanitation such as diarrhea, Typus, Dengue Hemorrhagic Fever (DHF), Acute Respiratory Infection (ARI) and even Stunting [3]. In 2018, recorded 1 in 3 Indonesian children were exposed to stunting, which means that there will be 33% of the number of Indonesian children who will have human resources that are difficult to perform, vulnerable to disease and easily overweight in adulthood [4]. If there is no intervention, it will change the demographic bonus in 2030 to become a demographic disaster [5]. In overcoming this problem there needs to be sector-wide collaboration in creating a framework for handling good data quality and analysis [6].

One of the basic sanitations which has an important role in environmental impact is the provision of healthy latrines so that no more feces are found that enter river water. Basic sanitation in the form of healthy latrines will reduce the rate of 60% diarrhea and 80% of other fatal diseases [7]. In 2013, Open Defecation in the world's poorest settlements affected the high number of deaths for children under 5 years [8]. To anticipate the importance of basic sanitation in the form of toilets, UN-Water conducted a campaign by making November 19th as a world toilet day.
The problem of access to basic sanitation in the form of healthy in Indonesia has become serious, with achievements in 2019 recorded at 78% [9]. This is an important concern because there are still 22% of Indonesian people who throw their feces, not into safe channels. This is worsened by the 72% access to safe drinking water services in Indonesia [10], which means that 28% of the community still relies on wells from surface water and groundwater that has been contaminated by 22% of Indonesian people. Factors that cause problems in the provision of septic tanks occur, namely not only from the government but from the acceptance of the community and the right technology [11]. Even the role of religious communities and women activists is very strategic needed [12]; [13]. The best effort can be done by sanitation practitioners to develop the smart approach for improving water, sanitation and hygiene in local communities [14].

In this study, the issue of sanitation is a strategic topic to support the level of human health, but there is not much research that has historically told in full the efforts of the city of Bandung in improving access to basic sanitation. Goal of this research will bring up the characteristics and efforts that have been, are being and will be carried out by Bandung City in improving access to basic sanitation to be able to Open Defecation Free (ODF).

2. Method

This study uses a qualitative approach sourced from primary data (semi-informal interviews and observations) and secondary data in the form of documentation, reports, and studies from online media. The data collection technique was carried out by means of purposive sampling, namely determining key informants according to the established themes [15]. Respondents selected from several agencies include the health office, Water Drinking Enterprises, Housing and settlement office, Environment office. This data will be used to describe the characteristics and phenomena in the form of social, economic and institutional challenges which are then grouped into existing data[16]. The analytical method used is descriptive analysis by describing data that has been collected into the form of explanations without generalizing in conclusions [15].

3. Result and discussion

Bandung is a Metropolitan City that has a high density of 14,930 people / km² in 2017, a city ranked 5 out of 20 Big Cities in Indonesia [17]. The density of the city of Bandung has led to the emergence of slum pockets such as housing along river banks, railroad areas, and suburban areas. It is noted that Bandung has 717 hectares [18]. Slums where the majority of them still dump their excrement into the river. Based on table 1, that the number of people who already have healthy latrines is still 63.99% meaning that there are 36.01% or around 860 thousand people of Bandung who have not yet fulfilled their basic needs.

| Types of Sanitation Access | Percentage (%) per Year | Growth Average (%) |
|----------------------------|-------------------------|--------------------|
| Improved Sanitation (Jamban Sehat Permanen, JSP) | 57.59 58.47 60.06 61.66 63.99 | 1.6 |
| Basic Sanitation (Jamban Sehat Semi Permanen, JSSP) | 42.41 41.53 39.94 38.34 36.01 |

Table 1 shows that each year the average increase is only 1.6%, with the level of slum areas of the city of Bandung that rely on the presence of ground well water, this has a high vulnerability. The highest growth for free carelessness to rivers was in last of 2019. To be more specific in table 2 and 3, it was shown specifically the conditions of access to basic sanitation in the form of healthy latrines in the city of Bandung. However, when broken down to kelurahan, it is shown that out of 151 Kelurahan there are...
7 kelurahan that have been ODF, namely Rancanumpang in 2015, Cihapit, Ciateul and Paledang in 2017, Citarum in 2018 and in 2019, Antapani Tengah sub district had only ODF in November 2019.

3.1. Challenging for sanitation access
In realizing basic sanitation access to open defecation, there are problems as well as challenges faced. From the results of data collection and analysis, the grouping of problems can be formulated as well as being a challenge in improving access to basic sanitation in Bandung as follows:

3.1.1. Economical challenge. The emergence of slums is caused by the economic inability of the community to access adequate housing. The implication is that many buildings do not have IMB, facilities, and utilities that do not meet eligibility standards. In the provision of private and communal septic tanks, there are still many who cannot afford it so there is a lot of financial innovation needed to procure septic tanks. ([19]; [20]).

3.1.2. Physical challenge. Bandung's diverse topography (up and down) implies that not all regions can utilize the Bojongsoang WWTP for the use of domestic feces. Limitations of minimum standards for septic tank land are often a major obstacle in building communal septic tanks in the slums of Bandung. It is necessary to utilize the available space to place the septic tank where this location can be reached by a suction car with a radius of 30-50 meters from the side of the road.

3.1.3. Institutional challenge. Bandung has 30 sub-districts with 151 Kelurahan and 1584 RW. All levels of community forums are still not synergistic in solving sanitation problems together. AMPL LWG which contains cross-sectoral has not been optimally empowered. Therefore, innovation is needed so that communication and coordination can work well in order to move in harmony.

3.1.4. Social challenge. Bandung with a diverse and dense population will have a lot of understanding. Understanding of proper sanitation cannot be done by the government. It takes a lot of Natural Leaders and women activists and religious leaders to provide triggering to the community. ([12]; [13], [8]).

3.1.5. Financial-infrastructure challenge. Bandung already has a massive Bojongsoang wastewater treatment facility but many people have not yet connected the sewage to the WWTP. This is one of them due to capital factors. Although there is a lot of capital access that can be accessed, such as ADB soft loans, IDB, Kotaku, Citarum Harum, etc.

3.2. Effort multilevel stakeholder for improving sanitation
In fulfilling access to basic sanitation 100%, the Bandung City Government has made several efforts both in the form of assistance from the central government, the provincial government and the city of Bandung itself which consists of components of Good Urban Governance namely the government, private sector and the community [21].
Table 2. Leveling of stakeholder program for sanitation.

| Level                  | Good Governance | Business/ Capital |
|------------------------|-----------------|-------------------|
| National/Province       | Government      | Community         | Business/ Capital |
|                        | • Kotaku Program| • Yayasan KEHATI  | • ADB             |
|                        | • SANIMAS       |                   | • IDB (2016-Now)  |
|                        | • Citarum harum|                   | • World bank (2019)|
|                        | • Clean River Program (PROKASIH) | | |
|                        | • Hibah APBD jawa Barat (2015-2017) | | |
| Local/Bandung          | • Piagam Pelangi (2017-Now) | • System Sewerage (SANIMAS) | • CSR Pembuatan MCK Biofarma |
|                        | • IPAL-Sharing Bojongsao dev’t | • Deklarasi Beresih jilid 2 Bandung ODF (2019) | |
| Sub District/Kecamatan | • Pemicuan STBM  | • RW Siaga Community | • Wirausaha Sanitasi Antapani. |
|                        | • IPAL-Sharing (Mandalajati dan Sukasari) | • Bebersih GOBER (2017-Now) | |
|                        | • Arisan (Dana Bergulir) Septictank Arcamanik (2018-Now) | | |

3.2.1. National level. At the national level, there is a good deal of concern in improving sanitation access and reducing stool along the Citarum River, both from the government, namely the KOTAKU (City without Slums) program, Community Based Sanitation (SANIMAS), Citarum Harum, Clean River Program (PROKASIH) and there are also several grants given from the Government of West Java Province to the City of Bandung. Whereas in the community sector, the KEHATI Foundation always provides education to the community around the Citarum river not to dump waste into the river. From the Business/Capital sector many lending schemes are also undertaken to create communal septic tanks. The assistance program from the Ministry of Public Works is in the form of soft loans to the ASEAN Development Bank (ADB) and the Islamic Development Bank (IDB). Even in 2019, this fund is worth 1.4 Trillion disbursed by the World Bank to help clean the Citarum River [22].

3.2.2. City level. At the city level, Bandung City Government is targeting that in 2020 Bandung will be free from ODF. The efforts made by the Bandung City Government to achieve the target are by conducting socialization to all community components and territorial apparatuses and related SKPDs in the framework of Clean and Healthy Living Culture (PHBS), holding the 2019 Sanitation Festival held at GSG Unjani, Jalan Terusahan Gatot Subroto, Bandung some time ago (3/12/2019), and with the Rainbow Charter program as a form of appreciation for areas that already have good access to sanitation. In addition, the government also built a wastewater treatment plant (IPAL) which is used to treat household wastewater from the service area of the city of Bandung and reduce the level of river pollution in the city of Bandung. Whereas in the community sector, the Bandung Healthy Forum (FBS) held the Bandung Volume II Cleanup activity with the theme of caring for parks and 100% ODF. FBS also invites all sub-districts to be involved in this activity by focusing on cleaning their respective regions.

3.2.3. Sub district level. The City Government of Bandung seeks to make Bandung free by ODF in 2020. Therefore, the Government is trying from the subdistrict level to trigger that the STBM program can be implemented well. In addition to the city level, the government is also trying to build a Waste Water Management Installation (IPAL) in Sukasari and Mandalajati sub-districts. In the community sector, GOBER has been carried out since 2017 until now. And also, efforts to raise funds for septic tanks in Arcamanik sub-district from 2018 to the present. In the business sector, the Antapani sub-district is opening a sanitation entrepreneur with the support of the Water and Sanitation Program (WSP).
this program, entrepreneurs provide sanitation facilities to meet community programs. Entrepreneurs are trained and introduced and linked to various markets.

4. Conclusion
In its implementation, the average growth of sanitation access in Bandung City is 2% per year. There are still many that can be optimized so that the rate of increase in access to basic sanitation can be accelerated. The Bandung ODF Declaration of 2020 at Beresih Is event in 2019 gave a strong commitment to mobilizing available resources in the City, Sectoral, District and various government forums and communities involved. All activities carried out need to be mapped properly so that there is synergy in handling within the scope of the City of Bandung

Acknowledgment
The authors extend their sincere gratitude to the Department of Urban and Regional Planning of the Bandung Islamic University. This paper was made possible by the help and funding from university programs. We would also like to thank the urban and regional planning program that accommodated the research activities at Bandung Islamic University

References
[1] Nelson K L and Murray A 2008 Sanitation for Unserved Populations: Technologies, Implementation Challenges, and Opportunities Annu. Rev. Environ. Resour.
[2] Bappenas RI 2015 Rencana Pembangunan Jangka Menengah Nasional 2015-2019 Rencana Pembang. Jangka Menengah Nas. 2015-2019
[3] Larsen D A, Grisham T, Slawsky E and Narine L 2017 An individual-level meta-analysis assessing the impact of community-level sanitation access on child stunting, anemia, and diarrhea: Evidence from DHS and MICS surveys PLoS Negl. Trop. Dis.
[4] Tampubolon N R 2019 Stunting Menyebabkan Kemiskinan Antar Generasi Kompasiana
[5] McKinsey 2012 The archipelago Economy: Unleashing Indonesia’s potential Appl. Econ.
[6] UN-Habitat U 2017 Action Planning for Cities: Oriented by the SDG11 and Supported by the City Prosperity Index – Capacity Building UN-Habitat
[7] Hunter P R and Prüss-Ustün A 2016 Have we substantially underestimated the impact of improved sanitation coverage on child health? A Generalized Additive Model panel analysis of global data on child mortality and malnutrition PLoS One
[8] UNICEF 2014 Progress on Drinking Water and Sanitation (Update 2014) (WHO Library)
[9] Kesehatan 2019 Data STBM
[10] Irwan Kelana 2018 Akses Air Minum Secara Nasional 72%, Sanitasi 76% Republika
[11] Zhou X, Li Z, Zheng T, Yan Y, Li P, Odey E A, Mang H P and Uddin S M N 2018 Review of global sanitation development Environ. Int.
[12] Angoua E L E, Dongo K, Templeton M R, Zinsstag J and Bonfoh B 2018 Barriers to access improved water and sanitation in poor peri-urban settlements of Abidjan, Côte d’Ivoire PLoS One
[13] Amin S, Rangarajan A and Bokrum E 2010 Improving sanitation at scale: lessons from TSSM implementation in East Java, Indonesia
[14] Cronin A A, Gnilo M E, Odagiri M and Wijesekera S 2017 Equity implications for sanitation from recent health and nutrition evidence Int. J. Equity Health
[15] Sugiyono 2014 Metode penelitian
[16] Huberman A and Miles M 2012 Understanding and Validity in Qualitative Research The Qualitative Researcher’s Companion
[17] Fadhillah B 2019 Dampak Tingginya Kepadatan Penduduk di Kota Bandung Kompasiana
[18] Nurul T 2019 Kota Bandung bebas kawasan kumuh
[19] Johal A 2006 Health-related quality of life in patients with sleep-disordered breathing: Effect of mandibular advancement appliances J. Prosthet. Dent.
[20] Owusu G 2010 Social effects of poor sanitation and waste management on poor urban communities: A neighborhood-specific study of Sabon Zongo, Accra J. Urban.

[21] UN-Habitat and UNESCAP 2015 The State of Asian and Pacific Cities 2015, urban transformations shifting from quantity to quality United Nations Hum. Settlements Program. United Nations Econ. Soc. Comm. Asia Pacific

[22] Prasetya A W Atasi Sampah di Citarum, Emil Usul Percepat Pencairan Dana Bantuan Bank Dunia