Water Governance Contribution to Water and Sanitation Access Equality in Developing Countries

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Abstract Access to basic water service and basic sanitation service has been acknowledged as fundamental human rights. It also has been mentioned in UN Sustainable Development Goals 6 to ensure that all people will have equal access to both water and sanitation service, as well as embedded in Goal 10 that aims to reduce inequality and promoting inclusiveness. However, the WHO/UNICEF Joint Monitoring Programme 2017 reported that 844 million people are still living without basic access to water, and 2.3 billion are still excluded from basic sanitation service. In this study, we present quantitative global-scale analysis of inequality of accessing the water and sanitation services from different wealth groups in 82 developing countries. We found that access inequality is rampant among developing countries particularly in terms of accessing basic sanitation service which the poor populations tend to be excluded in accessing the basic service. Based on combined multiple global data sets, we further identify which components of water governance are the key contributors to access inequality in water and sanitation services. We conclude that social and political dimension of water governance, such as government effectiveness, are influencing the occurrence of inequality of access to sanitation service in developing countries, while the inequality of access to basic water service was strongly influenced by the economic aspect of water governance, such as absorption of aid funds.

Plain Language Summary Access to basic water service and basic sanitation service has been acknowledged as fundamental human rights, and all people should have equal access to both water and sanitation service. Despite being placed in such important goals, a considerable number of people still facing difficulties from accessing to basic service. We present first analysis of inequality of accessing the water and sanitation services from different wealth groups in developing countries. We found that inequality is rampant among developing countries particularly in term of accessing basic sanitation service which the poor populations tend to be excluded in accessing the basic service. Water governance is the management system that control how water resources are allocated, including basic water and basic sanitation service provision. We conclude that social and political dimension of water governance are influencing the occurrence of inequality of access to sanitation service in developing countries, while the inequality of access to basic water service was strongly influenced by the economic aspect of water governance. These results can help government to understand how different the inequality of access of water and sanitation is, and to help making informed decision to address the issue of access inequality in more suitable approach.

1. Introduction

Along with the realization of basic human rights, achieving equity in water and sanitation services is the main target of Sustainable Development Goal (SDG) 6 (“Ensure availability and sustainable management of water and sanitation for all”); 6.1 and 6.2, respectively). The equitable allocation of both basic water and basic sanitation services is deeply embedded within the objective of the social system of sustainable development (Duran et al., 2015), and is indirectly addressed in SDG 10 (“Reduce inequality within and among countries”; 10.2, 10.3, and 10.B, respectively). Both the United Nations (UN) General Assembly and the Human Rights Council in 2010 stated that access to safe water and sanitation are two distinct basic human rights with equal status. These goals went through several stages of development in the Millennium-development goals (Fukuda et al., 2019) before they were established as the sixth goal of the
UN SDGs in 2015 (UN-Water, 2015a). There is a strong emphasis on the principle of “fairness of access,” which hints at a looming problem that needs to be addressed: the inequality of access. SDGs 6 and 10 are intertwined with myriad aspects of the other SDGs, and many have argued that they are targets at the center of the 2030 Agenda for Sustainable Development (Garrick et al., 2017; Griggs et al., 2013; Mugagga & Nabaasa, 2016; UN-Water, 2015b; UNESCO, International Social Science Council, and Institute of Development Studies, 2016). However, in the Global South, water institutions and water managers are generally weak and underfinanced (Dinar & Saleth, 2005). Because of this the South’s water governance systems are vulnerable to being dictated, and to being developed with an incomplete acknowledgment that water and sanitation are basic human rights. As a governance system, water governance shapes, controls, and manages access to water and sanitation (Meissner & Jacobs, 2016; Neef et al., 2009; OECD, 2015a; OECD, 2015b). Water governance connects the political, social, economic, and administrative systems that are established for the development and management of water resources and the allocation of water services to different groups of society (Rogers & Hall, 2003). Previous studies have shown that inequality is not an automatic outcome of certain development practices, but rather a systemic issue (Bartels, 2016; Ezcurra & Rodríguez-Pose, 2014; Rusca et al., 2017). Inequality has the potential to induce conflicts, hunger, insecurity, and violence; hamper economic growth and poverty reduction efforts; and create a polarized society (WHO/UNICEF, 2015b). The quantification of inequality could guide the development targets to more appropriately consider the most marginalized and disadvantaged groups and individuals (Cowell, 2015). The WHO and UNICEF Joint Monitoring Programme (JMP) for Water Supply, Sanitation, and Hygiene has published a new progress report and SDG baselines for basic drinking water, sanitation, and hygiene (WHO/UNICEF, 2017). The JMP uses service ladders and wealth quintile estimates (wealth status of the population divided into equal quintiles) to benchmark and compare, in a standardized format, the progress of national, urban, and rural populations. The UN-Water Global Analysis and Assessment of Sanitation and Drinking Water (GLAAS) surveys reported that 74% of the responding countries (55/74) have policies and plans in place for extending water and sanitation services to their poorer populations (UN Water and WHO, 2017). However, as per the actual specific measures of their financing plans, only 27% (for water services) and 19% (for sanitation services) of the 74 responding countries have consistently applied their policies and plans (UN Water and WHO, 2017). Previous studies have highlighted the essential role of water institutions and water governance in bringing about the “flow” of safe water and sanitation access (García Quesada, 2011; Griggs et al., 2013; Oki & Kanae, 2006; Oki et al., 2017; Shivakoti et al., 2015). One of the main challenges of water governance studies is how the findings of governance monitoring efforts can be integrated into the development of robust water policy, and address key water governance aspects that play an essential role in the realization of universal water and sanitation access. The identification of key issues in water governance could provide meaningful insights for tackling the issue of inequality in water and sanitation access. This study intends to bridge the monitoring efforts and effective policy implementation by identifying the essential elements of water governance to address in order to tackle access inequality.

2. Methods

This study consists of two main analyses. The first analysis investigates and quantifies the inequality of access to water and sanitation in developing countries. This is accomplished using the JMP data sets and producing the access inequality index for both basic water services and basic sanitation services in all the developing countries available in the data set (82 countries). The second analysis examines water governance performance, utilizing the WGI and WHO-UNICEF GLAAS data sets. In this study, the basic water service and basic sanitation service ladders of the WHO-JMP standard have been set as the minimum requirements for water and sanitation equality goals. The outputs from the two analyses will then be used to study the links between water governance factors (WGFs) and the inequality of access to water and sanitation.

2.1. Measuring Inequality of Access to Water and Sanitation

To accomplish the goals of this study, we used the data sets of the UNESCO-WHO JMP (2017), and conducted an analysis of 82 countries regarding population access per wealth quintiles data. Basic service was
chosen from the UNESCO-WHO JMP’s service ladders for the quantification of access inequality in water and sanitation services. First, we chose this because basic service is the minimum requirement to be classified as improved service for both water and sanitation (WHO/UNICEF, 2017). The second reason was that the data required for JMP to estimate access to basic services are already available in most countries (WHO/UNICEF, 2017). The percentages of population access of specific wealth groups (i.e., poorest to richest) to specific service ladders (e.g., basic service) are calculated to apply the GINI approach for quantification of access inequality (see Figure S1 and Note S1 in the supporting information). The GINI-based index will help illustrate how unequal population access distribution to basic water and sanitation services is based on wealth condition. A higher score on the index indicates higher access inequality to basic water and sanitation services. There are two main reasons why we measured inequality on the basis of JMP wealth quintile data sets. (1) The quality of data sets; JMP uses standardized wealth quintile analysis and collaborates with major international survey programs, such as UNICEF Multiple Indicator Cluster Surveys, Demographic and Health Surveys, and Living Standard Measurement Study; also, data sources are identified and validated through an extensive country consultation process (Swanson & Tayman, 2012). (2) The data set coverage: the JMP wealth quintile data set covers 82 countries with detailed information on the populations of different wealth groups’ access to all service ladders of water and sanitation.

2.2. Measuring Water Governance Performance

In order to analyze the water governance performance, we used the World Bank WGI 2016 data sets and the UN-Water GLAAS data set from the 2016–2017 cycle. We selected these data sets, rather than other existing data sets such as the fragile state index and corruption perception index, because we wanted to focus on the theme of water governance (see Table S2 in the supporting information for the details of the 29 selected indicators of the data sets and Figure S2 for UN-Water GLAAS data set structure). UN-Water GLAAS data sets provide in-depth interviews and survey results, which were mainly used for tracking the financing and management meant to provide equal water and sanitation services access in the country level under the SDGs framework. The WGI covers six dimensions of governance: (1) voice and accountability, (2) political stability and absence of violence, (3) government effectiveness, (4) regulatory quality, (5) rule of law, and (6) control of corruption (The World Bank Group, 2018). In this study, we selected only (3) government effectiveness (GE) and (4) regulatory quality (RQ) because of their relevance to water governance. Each single composite indicator is constituted by aggregating wide arrays of data sources and focuses on particular aspects of the governance dimension. GE and RQ are the indicators that directly relate to water and sanitation development, for example, Coverage area: drinking water and sanitation in GE and Enabling environments for investment in RQ. Twenty-six countries have complete data for all water governance performance indicators (for both WGI and GLAAS). We performed ensemble subset analysis by creating 100 subsets consisting of 20 randomly selected countries for each subset. In order to increase the statistical robustness of the water governance performance analysis, the subset analysis was based on nonparametric bootstrap resampling. We performed principal component analysis (PCA), along with varimax rotation, in order to reduce the dimensions of the variables and to deal with the multicollinearity of all 29 water governance indicators for the original data set and the 100 subset data sets. The principal components with eigenvalue (a value that tells the variance of a principal component) less than 1.00 are considered not significant (Girden & Kabacoff, 2011). From the PCA on the original data set, we extracted eight principal components with an eigenvalue greater than 1.00, which accounted for 83.43% and 83.67% of the cumulative proportion of variance for water and sanitation, respectively. The original eight principal components were used as a guideline to interpret varimax rotation patterns on the following ensemble subset analysis. We then performed PCA and multivariate regression analysis on the water and sanitation inequality for each single subset (n = 100 subsets). The resulting eight principal components of water governance factors were based on our qualitative interpretation of the varimax rotation patterns of the principal components obtained from PCA to the original water governance indicators (Table 1). The varimax rotation patterns helped us identify what the principal components from the PCA method actually represent (Note S2). The subset analyses determined the relative contribution of each principal component of water governance to water and sanitation access inequality. The principal components were then ranked based on their relative contribution to the access inequality index estimation of each respective subset before aggregated into the final ranking.
Table 1
Identified Water Governance Factors for Access to Basic Water and Sanitation Services Associated the Constituting Indicators of the GLAAS and the WGI Database

| Water governance factors                                      | Water                                                                 | Sanitation                                                          | Dimension |
|----------------------------------------------------------------|----------------------------------------------------------------------|---------------------------------------------------------------------|-----------|
| Implementation of government-defined financing plan           | Existence and level of implementation of a government-defined financing plan/ budget for the WASH sector which is published and agreed (urban, rural) | Existence and level of implementation of a government-defined financing plan/ budget for the WASH sector which is published and agreed (urban, rural) | Economic  |
| Transparency and credibility of financial reporting          | Expenditure reports are publicly available and easily accessible, and allow comparison of committed funds to expenditures (urban, rural) | Expenditure reports are publicly available and easily accessible, and allow comparison of committed funds to expenditures (urban, rural) |           |
| Credibility of managing ODA and external fund                | Absorption of external funds (% of official donor capital commitments utilized (three-year average)) (urban, rural) | Absorption of external funds (% of official donor capital commitments utilized (three-year average)) (urban, rural) |           |
| Absorption of domestic fund                                  | Absorption of domestic funds (% of domestic commitments utilized (three-year average)) (urban, rural) | Absorption of domestic funds (% of domestic commitments utilized (three-year average)) (urban, rural) |           |
| Financing plan to target vulnerable populations               | Specific measures in the financing plan to target resources to vulnerable populations\(^a\) (PP, PR, PD, WM, PI, PB, IP) | Specific measures in the financing plan to target resources to vulnerable populations\(^a\) (PP, PR, PD, WM, PI, PB, IP) | Social    |
| Policies and plans to target vulnerable populations           | 1. Policies and plans have specific measures to reach vulnerable groups\(^a\) (PP, PR, PD, WM, PI, PB, IP) | 1. Policies and plans have specific measures to reach vulnerable groups\(^a\) (PP, PR, PD, WM, PI, PB, IP) |           |
|                                                                 | 2. Tracking progress among vulnerable groups                          | 2. Tracking progress among vulnerable groups                          |           |
| Policy and regulation inclusiveness                           | Level of participation (urban, rural)                                 | Level of participation (urban, rural)                                | Political |
| Government effectiveness and regulatory quality               | 1. Government effectiveness\(^b\)                                   |                                                                     |           |
|                                                                 | 2. Regulatory quality\(^b\)                                          |                                                                     |           |

Note. Specific measures of each indicator are specified in parenthesis.
\(^a\)PP = poor populations, PR = populations living in remote areas, PD = people with disabilities, WM = women, PI = populations living in slums or informal settlers, PB = populations with high burden of disease, IP = indigenous populations. \(^b\)Indicators from WGI.

3. Results
3.1. Water and Sanitation Inequality

This study’s access inequality quantification is meant to address the inequality issue that has been concealed by previous reports’ use of average value and total population access per country. Our measurement focuses on the inequality among different wealth groups regarding basic water and sanitation services in developing countries. The access inequality quantification highlights how the inequality of access is associated with certain wealth conditions, while water and sanitation access inequality quantification has generally concentrated on spatial disparities (Pullan et al., 2014; Rusca et al., 2017), social inequality (Luh et al., 2013), and urban-rural disparity (Wang et al., 2012).

Water and sanitation access inequality maps (Figure 1) show that sanitation access inequality tends to be higher than water access inequality in developing countries. In comparison with other regions, the sub-Saharan African countries demonstrate a high degree of access inequality for both water and sanitation. Figure 1 also reveals the regions that have either no data or insufficient data to conduct an analysis of water and sanitation population access based on wealth groups. Further monitoring efforts are still required for the Oceania region and Caribbean countries. These efforts are especially urgent because multiple studies have highlighted serious water and sanitation issues in these regions (Luh et al., 2013; UN DESA, 2008; OECD, 2015b).

Our analysis revealed that, particularly for water inequality, countries with relatively low living standards tend to suffer higher levels of inequality for basic services (Figure 2). However, it is shown that even developing countries with relatively high living standards per capita, for example Gabon and Namibia, can potentially have a high level of inequality for basic sanitation services. There are various development pathways...
for each country to reach their own water and sanitation targets. Even though Gabon is considered as an upper middle-income economy, 34% of the Gabon population still lives in poverty due to high economic inequality (GINI index = 42.2; The World Bank, 2018b). Sub-Saharan African countries generally score higher in both water and sanitation inequality, but to varying degrees, as indicated by the examples of Zambia and Benin. Benin has a high level of access inequality in sanitation, but relatively lower access inequality in water. Zambia has the opposite situation: a high level of water access inequality, but a lower sanitation access inequality index. This pattern could reveal how countries prioritize addressing the issues of access to water and sanitation. However, a comparison of countries’ total access with their inequality indices revealed the important and overlooked information regarding access inequality in country-specific contexts, since there are variabilities in the comparison of total population access with the access inequality indices (Figure 3). In general, countries that have low inequality of access to water tend to have a high percentage of the basic service coverage for the total population. However, low inequality of access could also be associated with low total population coverage, and can be interpreted as low access to basic water service across different wealth groups. Another situation we encountered was high sanitation access inequality

Figure 1. (top) Water and (bottom) sanitation access inequality maps of developing countries from the JMP 2017 data sets (n = 82 countries). The inequality map illustrates the distribution of water and sanitation access inequality indices calculated from the JMP’s wealth quintile data sets of 82 developing countries (for the list of calculated access inequality indices, see Table S4)
conditions and relatively low total population coverage to the basic service, which implied that the gap between different wealth groups is very severe, and only a small portion of the population has access to basic sanitation service.

Figure 2. (a) Water and (b) sanitation inequality indices and GDP per capita (PPP) 2017. The inequality of water and sanitation in developing countries (n = 74 countries), with their respective gross domestic product (at purchasing power parity) per capita in U.S. dollars (The World Bank, 2018a). GDP (PPP) represents generalized differences in living standards between countries. Scales of the ordinates in subplot (b) and (c) are identical to subplot (a).

Figure 1. Water and sanitation inequality indices and total population access (%). The comparison of water and sanitation access inequality index with respective total population access (%) per country revealed the stark difference between water access and sanitation access inequality issue in terms of country-specific context.
3.2. Water Governance Performance

Based on the PCA results and the interpretation of varimax rotation patterns (Notes S2 and S3), the total 29 indicators of the combined data sets were reduced to eight principal components of water governance for the 26 countries (Table 1). Governance is not always limited to state-run organizations, and this hold true in the water governance context. Gardner et al. (1990) highlighted how natural resources can be governed by non-state organizations (with different degrees of formality) in different situations and societies (Table S3). Giving the classification of WGF to certain dimensions is not intended to compartmentalize the water governance system, but rather intended to understand how the WGFs of certain dimensions of water governance influence inequality of access. Subset-based multiple regression analysis quantifies how each WGF influences the inequality measured in the preceding water and sanitation inequality analysis (for more details see Note S3). Inequality of access has traditionally been associated with economic development, trade openness, and fiscal and political decentralization (Acemoglu et al., 2012; Ezcurra & Rodríguez-Pose, 2013). In contrast, the governance system has hardly been credited for its role in shaping inequalities (Ezcurra & Rodríguez-Pose, 2014). The water governance performance analysis was intended to study how water governance pathways could be contributing to inequality of access. The identified WGFs are ranked by each relative contribution to the access inequality index; we hope to determine which WGFs play a major role in producing access inequality. In the water governance context, sustainable governance relies on political, social, economic, environmental, and socio-spatial aspects and priorities, and is exceptionally contingent on local knowledge and wisdom (Kovács & Varjú, 2009) and the involvement of local stakeholders (Disterheft et al., 2015). The inequality and living quality analysis (Figure 2) and the inequality in the country-specific context analysis (Figure 3) inform us that sanitation inequality is far more complex than water inequality. This could help explain why the sanitation inequality trend tends to be higher and more challenging than the water inequality trend (Hutton, 2013; Johannessen et al., 2014). Figure 4 shows that the financial aspect of water governance, as represented by absorption of domestic fund and credibility of managing ODA and external fund, is the WGF that most influences access inequality to water services. On the other hand, sanitation services are more strongly influenced by the political and social dimensions of water governance, as represented by government effectiveness and regulatory quality and policies and plans to target vulnerable populations (for more detailed explanation of the dimensions of water governance, see Note S4).

4. Discussion

4.1. Water Governance and Access Inequality Nexus

Using the quintile-based population access data in the JMP data sets, this study managed to quantify inequality of access to water and sanitation for all available countries. The water governance analysis was also performed to determine how WGFs influence the inequality of access to water and sanitation service in developing countries. However, we do want to mention several limitations. First, even though the JMP report on this study uses the most recent data for household access to water and sanitation (WHO and UNICEF, 2019), the most recent data of wealth quintiles were derived from older data from the UNICEF 2016 report on this study uses the most recent data for household access to water and sanitation (WHO and UNICEF, 2017). Second, we encountered a limitation on country available data for the UN-Water GLAAS data sets. These data sets contain results from in-depth interviews and served as valuable tools in understanding the water governance regime of a country; however, only 26 countries have complete values. To overcome this limitation, nonparametric bootstrap resampling was applied to increase the statistical robustness, and the obtained regression models from the ensemble subset analysis were replicated to estimate the value of access inequality indexes of both water and sanitation (Note S3).

Absorption of domestic funds refers to the level of effectiveness of domestic capital funds allocated for water and sanitation service provisions. In developing countries, the rigid and lengthy procurement process in local governance could result in a late release of funds, as well as a limited availability of time within the financial year for which funds have been allocated (Montgomery & Elimelech, 2007; UN Water and WHO, 2017). Credibility of managing ODA and external funds refers to how efficiently donor capital commitments assist water and sanitation planning in recipient countries. The GLAAS 2016–2017 report shows that 60% of the countries surveyed absorbed a high percentage (over 75%) of donor capital commitments across
both drinking-water and sanitation, but are still rife with issues such as slow or delayed disbursement. Therefore, the link between absorption of external funds and the inequality of water and sanitation services could be explained by slow or delayed disbursement of funds. Operational delays, lags in receiving funds, corruption, lack of transparent practices, and low performance of recipients’ administrative and financial system capacities are several identified hurdles in the absorption of external funds (UN-­‐WWAP, 2006). Previous reports have also demonstrated that delayed or incomplete release of funds from national or local financing sources worsens the administrative, financial, and technical resource capacity for advanced water and sanitation planning, as well as the designing and management of ongoing projects (Global Water Partnership, 2006; OECD, 2014; UN Water and WHO, 2017; UN-­‐WWAP, 2006; World Bank Group, 2017). Government effectiveness and regulatory quality covers broad aspects of water governance. This WGF captures perceptions of survey respondents, nongovernmental organizations, commercial business information providers, and public sector organizations regarding the ability of the government to formulate and implement effective policies and regulations. Additionally, this component acts as an “enabler” for the effective institutional capacity to govern and manage the provisions of water and sanitation systems. The next WGF, Policies and plans to target vulnerable populations, directly confronts the issue of inequality. The political intention is specifically designed to address the findings of the JMP 2015, which stated that even though there has been some progress made toward achieving the water and sanitation targets of the UN Millennium Development Goals, there has not been significantly reduce inequality in several countries and regions (WHO/UNICEF, 2015a). This WGF reflects the motivation to reduce inequality and provide basic services for all; thus, it serves as the foundational part of the water governance system that addresses the access inequality issue. The policies and plans to target vulnerable populations need to correspond with specific measures in the financing plan to target vulnerable populations in order to reduce the gap in access equality in developing countries. This would ensure that there is political motivation to reach the vulnerable populations. In sustainable water governance principles, ensuring equity and equality of access to water and sanitation services is embedded within the principle of livelihood sufficiency and economic opportunity and Inter-­‐generational
and intra‐generational equity (Wiek & Larson, 2012). Both principles emphasize the equitable provision and sustenance of the basic livelihood requirements of water and sanitation. The principle of Socio‐ecological civility and democratic governance calls for water governance stakeholders to collaboratively participate in decision‐making to achieve certain goals. The principle is pivotal to basic service access equality (Wiek & Larson, 2012) and is specifically represented by the WGFs within the social and political dimensions in this study.

4.2. Access Inequality of Water Versus Sanitation

Understanding how different water governance factors interact with the water and sanitation service regime could help explain how access inequality of the two regimes behave in certain ways. From the water governance analysis, we found that current water access inequality is mainly influenced by the economic dimension of water governance; on the other hand, sanitation access inequality is influenced mainly by the sociopolitical dimension. It could be argued that developing countries underprioritize the sanitation access provision regime. This follows from the fact that the sociopolitical dimensions of water governance indicated the initial commitment of the water governance regime to provide pathways to reach the underserved or unserved populations. Furthermore, it could be due to how the sanitation target is often perceived as a secondary target, or it could be seen as the expected spill‐over effect of water projects that are not achieved in most cases (de Albuquerque, 2012; Mashiloane, 2017; Van Minh & Hung, 2011). The sociopolitical dimension, which is a foundation of water governance system, is in better shape in the water access regime, compared to in the sanitation access regime; this is a widely known idea (Black & Fawcett, 2008; de Albuquerque, 2012; Van Minh & Hung, 2011), and it was confirmed by our results of the water governance analysis. The question is: why? In order provide an answer, we have to start looking at the historical transition of water governance over the past decades. Several major events in global water discourse took place in the early 2000s; for example, World Water Forum in The Hague (2000), Bonn Freshwater Conference (2001), and Johannesburg Summit on Sustainable Development (2002) (Mollinga, 2008).

The rise of the theme of “good governance” from the high‐level discussions brought politics into the mainstream water governance discourse by promoting the ideas of accountability, transparency, and legitimacy (Mollinga, 2008). It is worth noting that in the 1990s, politics was treated as an “outsider” to most water policy circles, which preferred to discuss the technical aspects of water management (Harriss, 2002; Jenkins, 2003). On the other hand, the sanitation access regime does not have the privileges that the water access regime enjoyed. This situation seemed to be changing when the Millennium Development Goals set the stage for the sanitation crisis to be discussed in the global governance discourse (Fukuda et al., 2019). Additionally, the succeeding SDGs and acknowledgement of fundamental human rights helped the sanitation issue attempted to rise to the same level of importance as water in the global development priorities. However, in reality, water does have higher place in the development and political agenda (de Albuquerque, 2012). To our knowledge, the “International Year of Sanitation, 2008” (UN General Assembly Resolution A/RES/61/192 adopted in 2006) and the Global Sanitation Fund launched in 2008 were among the firsts of standalone and global‐scale efforts to push the sanitation development agenda forward, after the progress on Millennium Development Goals on sanitation moved slowly and lacked the attention of governments (de Albuquerque, 2012; Sustainable Sanitation Alliance, 2008; UNDP, 2006).

Findings from previous studies helped us to clarify the reason why sanitation access regime has always been overshadowed by water access regime despite their seemingly equal status of importance. Currently, the sanitation access regime is in a pretty similar situation to water governance in the 1990s, when the sociopolitical discourse not a part of the discussion; there is a lack of governance discourse that focuses solely on sanitation access compared to the discourse that focuses solely on water. The unequal treatment is also related to how the sanitation access issue is perceived as a mere facet of the bigger water access issue and to the belief that solving the water access issue would automatically solve sanitation access problem (Mosello et al., 2016; Sustainable Sanitation Alliance, 2008). The heavily depoliticized discourse on the sanitation access issue potentially leads to what social scientists call a “hidden discourse of resistance,” which is a condition of nonparticipation in the democratic process and nonbelief in the effectiveness of institutional place (Martins, 2015). This is corroborated by the tendency of neglected communities to fulfill their sanitation needs on their own (Collignon & Vezina, 2001), and by the results of our quantitative water governance analysis, which mentions that the sociopolitical dimension of water governance factors (i.e., represented by
government effectiveness and regulatory quality and policy and regulation inclusiveness) are among the most influential factors to the inequality of access to sanitation phenomenon. Slum communities, and other communities that were excluded from basic sanitation services, are trying their best to provide themselves basic sanitation services, mostly by relying on small-scale independent sanitation service providers; they have no hope that the state water governance regime could provide sanitation services (Black & Fawcett, 2008; Chaplin, 1999; Collignon & Vezina, 2001). The 2012 UN Special Rapporteur on the human rights to safe drinking water and sanitation report provided important insights regarding this condition.

The technical challenges (e.g., poor regional planning, logistics issues) to provide basic water and sanitation services to excluded populations are slowing down, if not preventing altogether, the inclusive water and sanitation development efforts. However, the technical reasons mentioned were often used by states and land-owners to deny permission for the basic sanitation and water services to be delivered effectively to excluded communities due to legal concerns and insecure tenure status (de Albuquerque, 2012). Municipal and national authorities are worried that, by providing basic water and sanitation services, authorities would have to legitimize the informal settlements and cause the growth of new informal settlements (de Albuquerque, 2012). The misleading perceptions that are rife in sanitation services developments and the distinct financial issues in sanitation service regime are further aggravating access inequality to sanitation services. Authorities believe that the capital cost to deliver sanitation service is irrationally high (Wilkinson et al., 2014). While sanitation services do require construction costs for latrines and maintenance costs, it is worth noting that there are plenty of socioeconomic benefits from investing in sanitation, and that households are spending more financial resources on access to sanitation than they are on access to water (de Albuquerque, 2012; Mashiloane, 2017; UN-ECE and WHO, 2012; Van Minh & Hung, 2011). In addition, the majority of the financing plans tend to focus on large-scale and centralized systems that favor certain portions of the population, rather than the localized and functional basic systems that could reach the underserved and unserved populations (de Albuquerque, 2012; WHO and UNDP, 2007; UN-Water, 2010). Even though the evidence of inequality in terms of the priorities of water governance regimes is irrefutable, the idea of delinking the sanitation access regime from the water access regime is a subject of debate because water and sanitation are closely interrelated with each other (Black & Fawcett, 2008). In order to achieve equity in access to water and sanitation, water governance with a strong motivation to reduce inequality of access is pivotal for to-the-point policy making. These motivations have to be translated into improved targeting and accountability on operational spending for projects dedicated to the vulnerable populations and people living in poverty. An understanding of the local context of needs and situations for access to sanitation and water services by community engagement is needed to ensure long-lasting and generally acceptable solutions (Berg, 2016; Castilla-Rho et al., 2015; de Albuquerque, 2012; Dill, 2013; Gächter et al., 2017; Jacobs et al., 2010).

5. Conclusion

We proposed a novel quantitative macroscale analysis of water governance which was made possible by the newly available data sets to identify and quantify the influencing water governance factors to inequality of access to the basic water and sanitation services in developing countries. It revealed that the national situations of water governance regimes (i.e., water and sanitation) are different from each other. This is particularly true in the terms of how each water governance dimension interplays with the inequality issues. The PCA-based ensemble subset analysis provided a robust conclusion that water access inequality is mainly influenced by the economic dimension of water governance, and on the other hand, sanitation access inequality is influenced mainly by the sociopolitical dimension. In other words, the social and political dimensions of water governance in the water access regimes performed relatively better than in the sanitation access regimes. This is due to the ongoing unequal prioritization of water access by the water governance regimes in developing countries. The “hidden discourse of resistance” in the sanitation access regimes hinders the effort to close the access inequality gap, thus resulting in severe access inequality to sanitation services in most developing countries.

Completely delinking sanitation access regimes from the water access agenda is not considered to be a viable solution to improve the access equality to sanitation services. The two water governance regimes are closely interrelated and need to be in synchronous coordination to achieve SDGs 6 and 10 and improve access to the
fundamental human rights of water and sanitation. Planning with correctly targeted project deliverables, a spirit of inclusiveness, and a human rights framework to share mutual visions with the targeted populations are as important as ever. However, readjusting our current water governance discourse to make sanitation access as important as water access is urgently needed for the realization of SDGs and fundamental human rights.

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