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Monitoring sanitation and hygiene in the 2030 Agenda for Sustainable Development: a review through the lens of human rights

Ricard Giné-Garriga^{*,**,¹}; Óscar Flores-Baquero^{*,**,²}; Alejandro Jiménez-Fdez. de Palencia^{*,***,³}; Agustí Pérez-Foguet^{*,**,⁴}

* Engineering Sciences and Global Development (ESc&GD), Universitat Politècnica de Catalunya, Barcelona (UPC), Spain

** Department of Civil and Environmental Engineering, Barcelona School of Civil Engineering (ETSECCPB), Universitat Politècnica de Catalunya (UPC), Spain

*** Stockholm International Water Institute (SIWI), Sweden

Email¹: ricard.gine@upc.edu

Email²: oscarfloresbaquero@hotmail.com

Email³: Alejandro.Jimenez@siwi.org

Email⁴: agusti.perez@upc.edu

Corresponding Author: Ricard Giné-Garriga

Address: Universitat Politècnica de Catalunya - Barcelona School of Civil Engineering

CAMPUS NORD - Edif. C2

C. JORDI GIRONA, 1-3

08034 BARCELONA

SPAIN

Email: ricard.gine@upc.edu

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Abstract

International monitoring of drinking water and sanitation has been jointly carried out by WHO and UNICEF through their Joint Monitoring Programme (JMP). With the end of the Millennium Development Goals (MDGs) era in 2015, the JMP has proposed a post-2015 framework for integrated monitoring of water and sanitation targets included in the Sustainable Development Goal no. 6. This article discusses how each element of the proposed sanitation target and corresponding indicators can be understood from a human rights perspective. Building on the MDGs, and although some of the weaknesses and gaps persist, the discussion suggests that the post-2015 proposal is a step forward towards a monitoring framework where human rights elements related to sanitation are effectively promoted. In addition, to support the interpretation and implementation of the normative content of human rights obligations related to sanitation, the study proposes a reduced set of easy-to-assess indicators to measure the normative criteria of this right, which are then grouped in a multidimensional framework to describe increasing levels of sanitation service. To do this, the study combines literature review and specific local experience from three case studies. It is shown that the proposed monitoring tools, namely the indicators and the multidimensional indicator framework, provide guidance on monitoring the human right to sanitation. In doing so, they might ultimately help sector stakeholders in the realization of this right.

Keywords

sanitation; hygiene; human right to sanitation; normative content; Sustainable Development Goals; indicator; monitoring

1. INTRODUCTION

Two in five of the world population still lack adequate basic sanitation. Globally, the United Nations estimates that about 2.4 billion people use unimproved sanitation facilities, and fewer than one billion people (946 million) practice open defecation (Joint Monitoring Programme, 2015a). This public health challenge has persisted for decades, despite its direct impact on human development: increased incidence of disease and death, chronic poverty, environmental degradation and the paths of opportunity through education blocked (Cairncross and Valdmanis, 2006; Scott et al., 2003).

Recognizing the fundamental importance of sanitation for sustainable development, a specific sanitation target was formulated in the Millennium Development Goals (target C of Goal 7) to halve the proportion of people without access to basic sanitation by 2015. In 2010, the MDG review summit identified sanitation as one of the most off-track targets, and despite commendable efforts by the international community, overall progress in recent years towards the MDG target has not improved substantially. Specifically, 2.1 billion people have gained access to an improved sanitation facility since 1990, but this has proved to be insufficient. The global target for sanitation has been missed by almost 700 million people (Joint Monitoring Programme, 2015a).

This being the case, the recognition of sanitation as a human right alongside water has been central to move the sanitation sector forward. Among others, it has served to clarify the role of States in ensuring universal access to adequate sanitation, to define monitoring standards to which States can be held to account, and to give priority to reaching those without access, particularly the vulnerable and marginalised, in a non-discriminatory manner (COHRE et al., 2008; United Nations General Assembly, 2012). The initial resolutions adopted in 2010 (United Nations General Assembly, 2010a, 2010b) have been supplemented by a recent resolution adopted in 2015, which recognises the distinction between the human right to water and the human right to sanitation (United Nations General Assembly, 2015a). With this resolution, the UN General Assembly clarifies that the rights to water and sanitation are separate from one another and have distinct features, despite their evident linkages and while they remain part of the right to an adequate standard of living. Furthermore, the separate recognition of the rights to water and to sanitation provides States a policy instrument with which to focus more attention and effort on their obligations related to sanitation.

Within the MDG period, monitoring data has played a key role in providing the evidence base for a range of different interventions and actions at different levels, from global to local. For instance, while national-level monitoring has served for policymaking, planning and financing, global monitoring has been useful to determine whether progress on international agreed goals has been reached. The Joint Monitoring Program (JMP) of UNICEF and the WHO has taken over the role of producing such national, regional and global estimates of population using improved sanitation facilities since 1990 (Bartram et al., 2014; Cotton and Bartram, 2008). Particularly in 2000, it

received a formal mandate to monitor progress towards the MDG drinking-water and sanitation target, with two single indicators: access to improved sources of drinking-water and access to improved sanitation facilities. Admittedly, the indicators employed during the MDG period have fallen short of measuring progress in some key areas, such as those mentioned under the normative content of the Human Right to Water and Sanitation (HRtWS). The normative content of a human right relates to the substance of this right, and in this study it might be understood as the content of human rights obligations related to sanitation (United Nations General Assembly, 2009; United Nations Human Rights Council, 2011). For economic, social and cultural rights (e.g. the right to sanitation), the content of these obligations is commonly clarified and operationalised under the criteria of availability, accessibility, quality, affordability, and acceptability (de Albuquerque and Roaf, 2014; Joint Monitoring Programme, 2015b; United Nations Economic and Social Council, 2002). If these criteria are taken as point of reference for defining a minimum level of sanitation service, it might be concluded that official statistics have over reported the number of people who have been counted as “covered / served”, as they base their estimates on a binary - improved / unimproved - categorization of available infrastructure.

The discussion on the post-2015 development agenda has presented an unprecedented opportunity to develop a strengthened, comprehensive and more responsive post-2015 monitoring framework. In 2015, the Open Working Group (OWG) on Sustainable Development Goals (SDGs) report to the UN General Assembly proposed a framework of 17 SDGs to cover a range of drivers across the three dimensions of sustainable development: the economic, social and environmental (United Nations, 2014; United Nations General Assembly, 2014). The OWG proposal includes a dedicated goal on water, which comprises six technical targets. Targets 6.1 and 6.2 seek to address the unfinished business and shortcomings of MDG target 7c and call for universal access to drinking water, sanitation and hygiene. As regards sanitation, target 6.2 reads “By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations”, and presumably it will be monitored by a new core indicator: “percentage of population using safely managed sanitation services” (Joint Monitoring Programme, 2015b). It comprises three main elements: i) a basic sanitation facility (MDG ‘improved’ indicator), ii) which is not shared with other households, and iii) where excreta are safely disposed in situ or transported and treated off-site. The benefits associated with improved hygiene are also taken into consideration, and the target includes an indicator for handwashing: “percentage of population with handwashing facilities with soap and water at home”. It refers to the presence of a device to contain, transport or regulate the flow of water to facilitate handwashing.

The aim of this research is twofold. First, we analyse the post-2015 sanitation target and the two related indicators through the lens of human rights. More specifically, we seek to determine how well the normative content of the human right to sanitation (HRtS) is integrated into the post-2015

indicator framework. To do this, we deepen our understanding of the HRtS to clarify the meaning of its normative criteria - and this is the second objective. The independent expert on the issue of human rights obligations related to access to safe drinking water and sanitation (UN Special Rapporteur as of 8 April 2011) provides the basis for defining sanitation in human rights terms and for considering the content of human rights obligations related to sanitation (United Nations General Assembly, 2009). Her guidance, however, still leaves some room for interpretation in the development of a framework for designing indicators for this human right. It is against this background that we offer a specific interpretation of the contents of the HRtS, and propose a reduced set of metrics that are pertinent for monitoring purposes. Integral to this proposal is the elaboration of a multidimensional tool to conceptualize different levels of sanitation service, where the normative criteria are assessed as independent dimensions. It adopts a sanitation ladder approach as a useful metaphor for incremental realization of the HRtS, i.e. people move from simpler sanitation solutions to more advanced ones by moving upwards on the ladder.

The paper is organised in three main sections. It starts by describing the methods. This section also documents three case studies implemented to validate research hypothesis and findings. Section 3 discusses the results achieved. It develops a rights-sensitive indicator framework to produce a consistent, credible and more complete picture of the context in which sanitation services are delivered. Then, the paper addresses the specific discussion on how the normative content of the HRtS is integrated in post-2015 target and indicators related to sanitation. Finally, it discusses the current JMP proposal for monitoring sanitation through a service ladder, and it proposes to capture the multidimensional nature of the ladder by elaborating the different levels of service on the normative content related to sanitation. The paper ends in Section 5 with a synthesis of conclusions and recommendations.

2. METHODOLOGY

This research builds on a combination of desk review and specific local experience from three case studies.

First, a literature review has been conducted about three main topics: i) the JMP post-2015 global monitoring proposal: goals, targets and indicators, ii) the human rights to water and sanitation-related literature: normative and cross-cutting criteria, obligations, and methodologies for human rights indicators' definition, and iii) other documentation related to frameworks and approaches for WASH monitoring. Specifically, the review has included relevant background papers elaborated by the JMP, reports of the UN Special Rapporteurs on the HRtWS - Catarina de Albuquerque and Léo Heller -, and a number of scientific papers, technical reports and grey literature published in the last decade. This extensive desk review has provided guidance on developing tools for monitoring the sector through the lens of human rights.

In parallel to the literature review, three different East African settings have been selected as initial case studies to test and validate the proposed tools, namely the district of Kibondo (Tanzania, in 2010), the district of Homa Bay (Kenya, in 2011), and the municipality of Manhica (Mozambique, in 2012). Data collection in all three cases took place in parallel to the consultation process launched by the JMP on the post-2015 WASH targets and corresponding indicators. Therefore, survey instruments were not initially designed for monitoring the SDG targets on water and sanitation. Instead, the proposed post-2015 indicator framework has been applied in this study to ex post classification of available data.

Each case study presented particular features, which are briefly summarized in Table 1. However, they all shared same approach, method and goals in terms of data collection: i) they were aimed at providing a complete picture of the context in which the sanitation service was delivered; ii) they included the household as key information source; ii) and different techniques were in place to collect data: a structured survey with closed-ended questions was complemented by direct observation of the sanitation and handwashing facility.

Table 1 Key features of the approach adopted for data collection in each case study

Case Study	Key features
Kibondo, Tanzania	<ul style="list-style-type: none"> - The total area is 16,058 km² and the population is estimated at 414,764 (2002 Tanzania National Census). - Total number of surveyed households: 3,656 in 20 wards. Sampling Plan (at ward level): $\alpha = 0.05$; $D = 2$; $d = \pm 0.10$; $n (\text{min}) = 192$. - HH checklist included 18 questions related to sanitation and domestic hygiene issues, 11 of them being measured by direct observation. Each interview lasted approximately 10 minutes. - The field team included one staff from Spanish NGO, 1 technician from District Water Department, two staff from a consultancy firm and two people from each visited village. Field work was completed in 42 days.
Homa Bay, Kenya	<ul style="list-style-type: none"> - The total area is 1,169.9 km², and the total population is about 366,620 (2009 National Census). - Total number of surveyed households: 1,157 in 5 divisions. Sampling Plan (at division level): $\alpha = 0.05$; $D = 2$; $d = \pm 0.10$; $n (\text{min}) = 192$. - HH checklist included 31 questions related to sanitation and domestic hygiene issues, 20 of them being measured by direct observation. Each interview lasted approximately 30 minutes. - Data collection did not include urban areas. It included schools (85) and health centres (37). - The field team included three staff from UPC (1 fully involved), 1 technician from the District Water Department (partially involved), and 1 technician from the District Public Health Department (partially involved), 8 staff from a consultancy firm, and one people from each visited community. Field work was completed in 33 days.
Manhica, Mozambique	<ul style="list-style-type: none"> - The total area is 250 km² and the population is estimated at 57,512 (2007 national estimates) - Total number of surveyed households: 1,229 in 18 bairros. Sampling Plan (at bairro level): $\alpha = 0.05$; $D = 2$; $d = \pm 0.15$; $n (\text{min}) = 86$. - HH checklist included 46 questions related to sanitation and domestic hygiene issues, 24 of them being measured by direct observation. Each interview lasted approximately 40 minutes. - Data collection included schools (16) and health centres (2) - The field team included three staff from UPC (1 fully involved), 3 technicians from the Vereação para Urbanização, Construção, Água e Saneamento (partially involved), 14 staff from a consultancy firm and 1 people from each visited village. Field work was completed in 29 days.

3. RESULTS AND DISCUSSION

This Section explores the importance of embedding human rights elements into global monitoring. It starts by proposing simple indicators and an indicator framework for monitoring the HRtS. It then discusses how and to what extent the post-2015 framework seeks to make monitoring the sanitation target and indicators rights-sensitive. For illustrative purposes, the last part of the section shows a specific application of the proposed monitoring tools, followed by a discussion of their validity from a practitioner-oriented perspective.

3.1. Developing an indicator framework for monitoring the HRtS

In recent years, great efforts have been devoted to clarifying the scope and content of the human right to sanitation (COHRE et al., 2008; Langford et al., 2014; United Nations General Assembly, 2009). In an indicative example, the independent expert states in her report that “sanitation can be defined as a system for the collection, transport, treatment and disposal or reuse of human excreta and associated hygiene”. The report also points out that “States must ensure without discrimination that everyone has physical and economic access to sanitation, in all spheres of life, which is safe, hygienic, secure, socially and culturally acceptable, provides privacy and ensures dignity” (United Nations General Assembly, 2009).

In the process of developing the monitoring architecture for the implementation of this human right, it is essential to identify metrics and indicators that put the previous definition in a functional framework. One could approach this by defining indicators based on their human rights’ typology: structural, process and outcome (OHCHR, 2012). Such configuration brings to the fore an assessment of the steps being taken by States in addressing their obligations, i.e. from commitments and acceptance of international human rights standards (structural indicators) to efforts being made to meet the obligations that flow from the standards (process indicators) and on to the results of those efforts (outcome indicators). Alternatively, a second approach to developing indicators would be to identify the key elements of the right to sanitation (Roaf et al., 2005). This method therefore commences with considering the content of human rights obligations related to sanitation, and then examines the various indicators that could be best used to measure the applicable aspect of this human right. The normative content of the HRtS provides the relevant human rights standards - or the normative criteria -, and includes the issues of availability, quality/safety, acceptability, physical accessibility and affordability – the so-called “AAAAQ” criteria (United Nations General Assembly, 2010c, 2009). However, the cross-cutting criteria of non-discrimination, participation, accountability, impact and sustainability should also be considered in the indicator framework. They are based on human rights principles and more general human rights considerations.

To date, various attempts have been made to monitoring the realization of the HRtWS (Flores Baquero et al., 2016b, 2013; Luh et al., 2013; Roaf et al., 2005), but the focus has been primarily

on water. This paper deals specifically with sanitation. In indicators' development, it adopts the second of the two approaches mentioned in the previous paragraph, and the focus is on the normative criteria given their specific nature. In determining the content under each criterion, it is important to recognize that some elements may be understood from different angles, and that a degree of flexibility is needed in their interpretation. In other words, the classification of one element - e.g. physical location of the sanitation facility - as an issue of accessibility or availability is not as important as the fact of including this key aspect in the monitoring framework (United Nations General Assembly, 2009). It is equally true, however, that some guidance is needed to monitor the implementation of the HRtS. The classification of main sanitation elements in a well-structured, yet sufficiently flexible framework to identify indicators would assist practitioners in monitoring this right. The definitions provided in Table 2 were proposed by Flores Baquero et al (2016) in a previous study, and they contributed to making a step forward in this direction.

The next step would be to develop a reduced set of easy-to-use indicators and metrics to track the provision of sanitation services on the basis of their normative content. In attempting to do so, two important issues may be noted, as acknowledged by the UN Special Rapporteur (United Nations General Assembly, 2012). Firstly, there are differences between developing indicators for human rights monitoring and indicators to be used in monitoring development outcomes in the post-2015 period. The first group of indicators are designed to closely relate to specific legal norms, and they should reflect and measure all elements of a right, including integration of cross-cutting human rights norms such as non-discrimination, participation and accountability. The second group integrates human rights elements into the post-2015 monitoring framework. Secondly, the process of translating human rights obligations into concrete indicators should allow for flexibility and context-specificity (de Albuquerque and Roaf, 2014; Roaf et al., 2005). Table 3 proposes a short list of illustrative indicators to monitor sanitation outcomes from a human rights perspective. In doing so, it contributes to operationalizing the normative content of the right to sanitation and makes monitoring processes more consistent, rigorous and transparent.

Beyond the proposed list of easily accessible and practical indicators, however, it is worth noting that the sector is increasingly adopting a 'service ladder' approach to benchmark and track progress. This is grounded in the idea of incremental progression between service levels of different quality, ranging from a very basic service (or no service at all) to a very advanced level of service. Indeed, the concept of a ladder whereby users start at the bottom rung and climb to the top has been widely used within the sector (Joint Monitoring Programme, 2015b, 2008; Kayser et al., 2013; Kvarnström et al., 2011; Potter et al., 2011), and is consistent with the Human Rights concept of progressive realization. On the basis of the indicators discussed above (Table 3), and taking the sanitation service ladder approach as a reference point, a multidimensional monitoring framework is proposed in Table 4 for measuring the implementation of the HRtS. Specifically, four different service levels are defined to elaborate on the normative content related to sanitation.

It makes a soft interpretation of the principle of “progressive realisation”, as it does not take into account States’ obligation to use the maximum available resources to determine progress. Instead, the focus is on sustaining the quality of service and promoting behavioural change, which may be understood as the progressive realisation towards universal access (United Nations General Assembly, 2010c). The underlying idea is that incremental improvement in the level of service - from a rights perspective, i.e. the AAAAQ criteria - would contribute to move up rung-by-rung on the ladder. In practice, the table is useful to illustrate how each level of service can be understood from a normative perspective, where each criterion can be assessed separately in relation to the others. This may show, for instance, that the level of service in a given household meets the top quality and safety standards but does not fulfil the minimum conditions in terms of accessibility. In sum, the elements proposed for monitoring - defined in Table 2 and operationalised in Table 3 - are ultimately designed to match the normative interpretation as closely as possible, while recognizing that some of them are not yet possible to measure on a routine basis (Table 4).

Table 2 Key concepts and composition of human right to sanitation normative criteria. *Source:* Flores Baquero et al (2016)

AAAAQ Criteria	Key Concepts	Definition
Availability	Improved sanitation; Sufficient number of facilities; Individual and/or shared use of facilities	An "improved" sanitation facility is one that hygienically separates human excreta from human contact. There must be a sufficient number of improved sanitation facilities (with associated services) within, or in the immediate vicinity, of each household and in other "high-use" settings (schools, health facilities, workplaces, markets, etc.). Although it is tempting to determine a specific minimum number of toilets needed to meet the requirement of availability, such determinations can be counterproductive in human rights terms. It must be recognised that not only a latrine at home but also shared or even public facilities could satisfy the availability criterion in some contexts. It is crucial that the assessment of the sanitation service level in any community is informed by the context, as well as the needs of particular groups which may have different sanitation needs. It is vital to promote users' participation for this purpose.
Physical Accessibility	Reliable accessibility; Access at all times of day and night; Reasonable waiting times; Safe and convenient path for all; Easy-to-use and adapted technology	Sanitation facilities must be physically accessible for everyone; i.e. accessibility must be reliable, including access at all times of day and night and ensuring that waiting times are not unreasonably long. The location of sanitation facilities is critical as it must ensure minimal risks to the physical security of users. This has particular implications for the path leading to the facility, which should be safe and convenient for all users, particularly those with special access needs, such as children, persons with disabilities, elderly persons, pregnant women, parents accompanying children, chronically ill people and those accompanying them. Moreover, sanitation facilities should be constructed in a way that guarantees the physical integrity while using them, minimizing the risk of attack from animals or people, particularly for women and children.
Quality / Safety	Technical safety; Hygienic safety; Access to water for handwashing and other hygiene practices; Menstrual hygiene management; Hygienic cleaning and emptying of pits; Safe management and disposal of human urine and faeces	To meet the standard of quality, the focus is on both the individual user and the affected collective. Sanitation facilities must be technically safe to use, which means that the superstructure is stable and the floor is designed in a way that reduces the risk of accidents. Special attention should be paid to the safety needs of persons with disabilities and children. Sanitation facilities must also be hygienically safe to use, which means that they effectively prevent human, animal and insect contact with human excreta, and that excreta is safely disposed in situ or treated off-site. Sanitation facilities must ensure access to water for handwashing and anal and genital cleansing. The facility has to be equipped for adequate menstrual hygiene management, which includes the hygienic disposal of menstrual products. Regular cleaning, emptying of pits or other places that collect human excreta, and maintenance are essential for ensuring the sustainability of sanitation facilities and continued access.
Affordability	Reasonable price of sanitation services for all	Access to sanitation facilities and services, including construction, emptying and maintenance of facilities, as well as treatment and disposal of faecal matter, must be available at a price that is affordable for all people without limiting their capacity to acquire other basic goods and services, including water, food, housing, health and education guaranteed by other human rights. Water disconnections resulting from an inability to pay also impact on waterborne sanitation, and this must be taken into consideration before disconnecting the water supply
Acceptability	Cultural issues related to the service; Privacy; Gender issues	Sanitation facilities and services must be culturally acceptable. Personal sanitation is still a highly sensitive issue across regions and cultures and differing perspectives about which sanitation solutions are acceptable must be taken into account regarding design, positioning and conditions for use of sanitation facilities. In many cultures, to be acceptable, construction of toilets will need to ensure privacy. In most cultures, acceptability will require separate facilities for women and men in public places, and for girls and boys in schools. Facilities will need to allow for culturally acceptable hygiene practices.

Table 3 Sanitation descriptors based on human right normative content: indicators and service levels

AAAAQ Criteria	Indicator	Survey technique	Service Level Description			
			Good level of service	Intermediate	Poor	No level of service
Availability	Type of sanitation facility - Sanitation ladder ^a	Direct question / Observation	Improved ^b	Improved / Shared	Unimproved ^b	Open Defecation
	Toilet facility location ^a	Direct question / Observation	Inside the house	In the compound	In the neighbour's compound / In a public place	
Physical Accessibility	Safety and security while accessing the sanitation facility ^a	Direct question (perception)	Safe and secure (the physical integrity of users while accessing the facility is guaranteed)		Unsecure (the physical integrity of users while accessing the facility is not guaranteed)	
	Safety and security while using the sanitation facility ^a	Direct question (perception)	Safe and secure (the physical integrity of users while using the facility is guaranteed)		Unsecure (the physical integrity of users while using the facility is not guaranteed)	
	Continuity of use of the latrine ^a	Direct question	Full access (during all day and night)	Partial access (the facility is available at least 18 hours per day)	Limited access (the facility is available less than 18 hours per day)	
	Suitability of use of the latrine ^{a,c}	Observation	Suitable for all (men, women, girls and boys of all ages)		Not suitable for particular population groups (the elderly, women, girls or boys of all ages, etc.)	
Quality and Safety	Sanitary conditions of the latrine (presence of insects, unpleasant smell, and cleanliness) ^d	Observation	Adequate sanitary conditions (no insects, no smell, adequately clean)	Acceptable sanitary conditions (few insects, slight unpleasant smell, some dirt but no faeces or urine)	Poor sanitary conditions (insects, strong unpleasant smell, faeces or urine on the floor)	
	Latrine standards (condition of lined pit and upper superstructure)	Observation	Adequate latrine standards (lined pit, superstructure no damaged)	Acceptable latrine standards (inadequate lining of the pit and damaged superstructure)	Poor latrine standards (no lined pit, no superstructure)	
	Hand washing facility and soap in the vicinity of the latrine ^a	Observation	Hand-washing facility with water and soap / ash	Hand-washing facility with no soap / ash	Hand-washing facility with no water / No hand-washing facility	

Quality and Safety	Hygienic practices in the latrine (availability of water and materials for anal and genital cleansing, menstrual hygiene management, hygienic disposal of cleansing materials and menstrual products) ^d	Observation	Adequate hygienic practices (availability of water and cleansing materials, adequate menstrual hygiene management, hygienic disposal of cleansing and menstrual products)	Acceptable hygienic practices	Poor hygienic practices (no water / cleansing materials, inadequate menstrual hygiene management, unhygienic disposal of cleansing and menstrual products)	
	Safe management and disposal of human urine and faeces ^a	Direct question / Observation	Safe disposal of excreta (disposed in situ or treated off-site)	Safe removal / transport of excreta off-site, with no treatment	Unsafe emptying of pits / Unsafe transport of excreta off-site / Inadequate containment of faeces and urine	
Affordability	Affordability of sanitation services (it refers to the affordability of infrastructure, as well as affordability of ongoing operation and maintenance)	Direct question	Sanitation service is affordable, without limiting the capacity to acquire other basic goods and services guaranteed by other human rights	Sanitation service is not affordable, but the household is not excluded from the service because of an inability to pay	The household is excluded from the service because of an inability to pay	
Acceptability	Conditions of privacy in the latrine	Direct question (perception)	Adequate		Poor privacy / No privacy	
	Conditions of comfort in the latrine	Direct question (perception)	Adequate	Acceptable	Inadequate	
	Cultural-related issues	Direct question	The facility is culturally acceptable to all household members	Cultural issues hinder continued use of the latrine by at least one member of the household	Cultural issues hinder continued use of the latrine by all household members	

Notes: a) Indicator included in the proposed definition of adequate sanitation for the post-2015 period; b) An improved sanitation facility is defined as one that hygienically separates human excreta from human contact. It includes the following types: flush or pour flush toilets to sewer systems, septic tanks or pit latrines, ventilated improved pit latrines, pit latrines with a slab, and composting toilets. Unimproved sanitation facilities include: flush/pour flush not going to sewer/septic/pit, pit latrines without a slab, hanging and bucket latrine; c) The need to adapt toilet facilities would not apply to households where disabled people are known not to reside; d) The proposed aggregation function employed to build up the composite is the arithmetic mean of available indicators (e.g. to calculate an index of latrine sanitary conditions, one could average three proxies, namely inside cleanliness, presence of insects and smell).

Table 4 Indicator framework for post-2015 monitoring of sanitation

JMP Sanitation Ladder	Service Level Descriptors, based on the HHRR Normative Criteria						
	Level of Service	Indicator	Availability	Physical Accessibility	Quality / Safety	Affordability	Acceptability
Safely managed sanitation: % of population using an improved sanitation facility which is not shared with other households and where excreta is safely disposed in situ or treated off-site.	Good level of service	% of households with optimal level of sanitation service	Improved sanitation in the household	Access at all times of day and night Safe and secure use of the facility for all household members Safe access and convenient for all	Hygienically safe to use (clean, no insects and odour-free) Adequate latrine standards, i.e. lined pit and upper superstructure no damaged Adequate hygienic practices (availability of water and cleansing materials, adequate menstrual hygiene management, hygienic disposal of cleansing and menstrual products) Hand-washing facility with soap / ash in the vicinity of the latrine Excreta is safely disposed in situ or transported to a designated place for safe disposal or treatment.	Sanitation service is available at a price that is affordable, without limiting the capacity to acquire other basic goods and services guaranteed by other human rights. It refers to the affordability of infrastructure, as well as affordability of ongoing operation and maintenance.	The facility is culturally acceptable to all household members (e.g. separate facilities for women and men where needed) Adequate conditions of privacy Adequate conditions of comfort
Basic sanitation: % of population using an improved sanitation facility which is not shared with other households							
Shared sanitation: % of population using an improved sanitation facility which is shared with other households							
	Intermediate level of service	% of households with intermediate level of service	Improved / Shared sanitation in the immediate vicinity of the household	Partial access: the facility is available at least 18 hours per day	Acceptable hygienic conditions (few insects, slight unpleasant smell and some dirt) Inadequate lining of the pit and damaged superstructure Acceptable hygienic practices in the latrine Hand-washing facility with no soap / ash Excreta is removed and transported safely off-site, with no treatment	Sanitation service is not available at a price that is affordable, but the household is not excluded from the service because of an inability to pay	Cultural issues hinder continued use of the latrine by at least one household member Acceptable conditions of comfort

Unimproved sanitation: % of population using unimproved sanitation facilities, with or without sharing with other households	Poor level of service	% of households with poor level of service	Unimproved sanitation Improved / Shared sanitation located outside the household	Limited access: the facility is available less than 18 hours per day Unsecure: the physical integrity of users while using the facility is not guaranteed The path leading to the facility does not guarantee the physical integrity of users Access to and use of the facility is not convenient for all users, particularly those with special needs, such as children, persons with disabilities, elderly persons, pregnant women, etc.	Hygienically unsafe (not clean - faeces or urine on the floor -, insects and a strong unpleasant smell) No lined pit and / or no superstructure Unhygienic practices (no water / cleansing materials, inadequate menstrual hygiene management, no mechanisms for hygienic disposal of cleansing and menstrual products) No hand-washing facility in the vicinity of the latrine Excreta are deposited in or nearby the household environment. Excreta may be flushed to the street, yard/plot, or an open sewer	The household is excluded from the service because of an inability to pay	Cultural issues hinder continued use of the latrine by all household members Inadequate conditions of privacy Inadequate conditions of comfort
No service: % of the population practicing open defecation	No Service	% of households with no service	Open defecation				

3.2. Interpreting the post-2015 sanitation target from a normative perspective

This Section discusses the integration of human rights elements into the SDG sanitation target and corresponding indicators. In particular, the focus is on the interpretation against the AAAAQ criteria of the different elements included in the post-2015 monitoring proposal.

One initial point to underline is that the General Assembly resolution not only recognises the content of entitlements under the right to sanitation, but also highlights that these entitlements apply “without discrimination” (United Nations General Assembly, 2012, 2010a; Van de Lande, 2015). Remarkably, the MDG targets succeeded in increasing overall population coverage, but they did not address disparities between and within countries (Joint Monitoring Programme, 2015b). The JMP created one Working Group on Equity and Non-Discrimination (END) to advise on how post-2015 goals, targets, and indicators could be designed to capture information about inequalities and discrimination (Joint Monitoring Programme, 2012a). Many of the recommendations of the END Working Group were considered to be relevant and useful to formulate the architecture of post-2015 development goals. For instance, one stand-alone goal on equality has been adopted (Goal 10), in addition to the integration of non-discrimination in the different sectors. As regards sanitation, the target integrates concerns of universality and equality, which are both integral to a human rights approach. Specifically, the post-2015 target aim for universal access, and call for the reduction and ultimate elimination of gaps in access through targeting the “most disadvantaged groups”, while retaining attention to intra-household inequalities, i.e. taking into consideration the special needs of women, girls, and people living with disabilities (Joint Monitoring Programme, 2015b). The END working group determined on the one hand four stratifiers for monitoring inequalities: urban-rural, wealth, urban settlements, and disadvantaged groups. On the other hand, since group-related discrimination often manifests differently across regions and in countries, the group also recommended that States should adopt participatory approaches to identify which population groups are suffering discrimination and exclusion (Joint Monitoring Programme, 2015b).

The content of human rights obligations also emphasises the importance of health and environment protection (COHRE et al., 2008). Conceptually, the framework to define a sanitation service should thus include the i) containment, ii) collection, iii) treatment, iv) disposal and (v) reuse of human faeces and urine (Potter et al., 2011). The post-2015 sanitation proposal approaches this framework by integrating elements related to the practice of open defecation, the adequacy of the toilet facility and the management of the excreta. By definition, the MDG categorisation of facilities between improved / unimproved focuses on the hygienic separation of excreta from human contact, i.e. the containment of excreta at the user facility level. In addition, the post-2015 proposal comprises one new element: excreta have to be safely disposed in situ or treated off-site. It therefore addresses the management of faecal matter and its removal from the household environment, and in doing so, target 6.2 interfaces along the sanitation chain with key

elements under target 6.3, as ‘halving the proportion of untreated wastewater’ and ‘increasing recycling and safe reuse’. Another of the focuses is on ending open defecation, in order to contribute to a clean and hygienic environment that benefits everyone. It is not only a right for each person to access a sanitation facility, but also a right to be protected from excreta produced by others in the neighbourhood: no one can fully exercise the right to sanitation unless his or her community proceeds towards open defecation free status. The collective dimension of the HRtS is indeed one of its key descriptors, particularly in comparison with the HRtW (Langford et al., 2014). It is remarkable in this regard that social motivation approaches – e.g. ‘Community-led Total Sanitation’ (CLTS) - have drastically contributed to advancing progress towards ending open defecation. Interestingly, however, it is unclear whether social mobilisation – which may include punitive actions or systematic humiliation of people defecating – can compromise or infringe other individual human rights (Bartram et al., 2012). The classification of shared facilities as unimproved may be also questioned (Exley et al., 2015). Public toilets or toilets shared between households, although not optimum, can be an interim solution where they are well-managed, culturally acceptable, kept in a hygienic condition and where access is affordable or free. However, little evidence exists to support a threshold for acceptable sharing (Joint Monitoring Programme, 2015b), and more research is needed to determine the number of users who can keep shared sanitation facilities clean (Simiyu, 2016). Today, no clear consensus exists on considering certain categories of shared sanitation as “improved” (Giné Garriga et al., 2011; Heijnen et al., 2014). The post-2015 proposal, however, continues to report the population using improved facilities and those who share the facility as separate rungs on the sanitation ladder (Joint Monitoring Programme, 2015b).

The post-2015 proposal makes it very clear that sanitation facilities must be physically accessible for everyone at all times of day and night. The location of sanitation facilities must ensure minimal risks to the physical security of users, particularly when they are not inside the house or in the household’s compound. One recent study shows, for instance, that environmental barriers, social factors and fears of sexual violence may contribute to sanitation-related psychosocial stress when access to sanitation or the infrastructure itself is inadequate. And these negative impacts are experienced primarily by women and girls (Sahoo et al., 2015). The data from our case studies suggest that the latrine, where available, is typically located within the household’s compound (see Figure 1). The HRtS also entitles everyone to physical access to sanitation in all spheres of life. People may spend large amounts of time away from the household, and unsafe sanitation and hygiene practices outside the household can consequently have important impacts on health, welfare and productivity, and can also drive intra-household inequalities in exposure (Joint Monitoring Programme, 2012a). Specifically, the JMP recommends prioritising schools and health care facilities for extra-household monitoring, as global and national WASH norms already exist in these settings (Joint Monitoring Programme, 2015b). In Homa Bay District, where a

random sample of schools was included in the survey (see Table 1), the analysis shows that by and large there is a shortage of latrines, according to the minimum Kenyan standard of 25 girls per drop hole and 30 boys per drop hole. Only a small percentage of schools meets the minimum standard (10% for boys and 7% for girls), and a further 28% (for boys) and 22% (for girls) are halfway to meeting it. The majority of centres (50%, boys; and 57%, girls), however, show ratios of over 60/50 pupils per drop hole, and 12% / 14% have no latrines at all (for boys and girls respectively). In all, the study area presents an overall ratio of 66.5 pupils per drop hole, 64.5 for girls and 68.5 for boys. A direct consequence of the problem of overcrowding is that compound hygiene is generally poorly maintained.

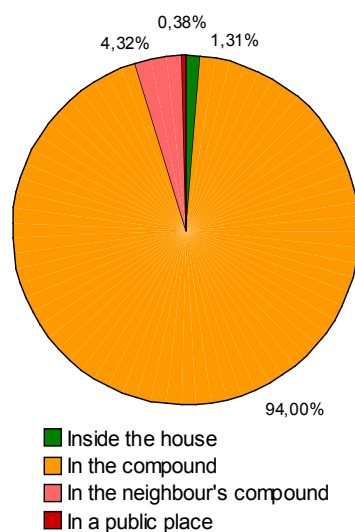


Figure 1 Accessibility: Latrine location (Homa Bay)

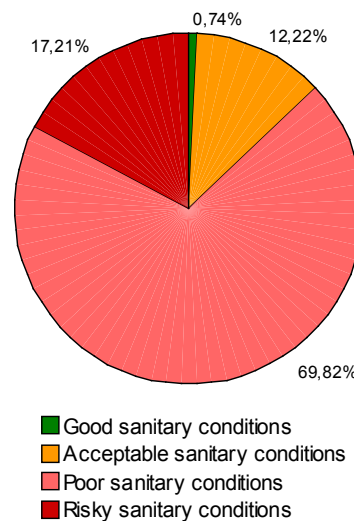


Figure 2 Quality: Sanitary conditions (Kibondo)

A major focus of the normative content is on quality and safety issues: the facility should be technically safe to use - the superstructure is stable and the floor is designed in a way that reduces the risk of accidents -, and hygienically safe to use. These are key elements as they might constrain a continued use of the infrastructure. In addition, a lack of the latrine's maintenance may also result in a focus of disease transmission (Exley et al., 2015; Scott et al., 2003). The proposed target is unclear, ambiguous and does not properly address these dimensions, despite the fact that a considerable number of facilities often lack safe conditions (Giné Garriga and Pérez Foguet, 2013). For instance, in those surveyed households where a latrine was used, its hygienic condition was visually evaluated, and particularly three different proxies were verified: i) inside cleanliness, ii) presence of insects, and iii) smell. It can be seen in Figure 2 that in Tanzania roughly nine out of ten improved facilities do not present "acceptable" conditions, and similar percentages are reported in rest of countries. A closer analysis of the data shows that on average i) only 10.3% of observed latrines are found clean; ii)

very few are fly-proof and insects are observed in nearly all latrines (99%); and iii) an unpleasant smell is reported in almost three-quarters of inspected latrines.

As regards hygiene, it is equally important to promote menstrual hygiene management, this being an area with strong impact on gender equality. The lack of attention to the needs of women and girls is starkly apparent (United Nations General Assembly, 2012). Ideally, all menstruating women and adolescent girls should have easy access to the facilities and materials that they need in order to manage menstruation hygienically, with dignity, and in safety. The END Working Group initially proposed separate indicators for handwashing with soap and menstrual hygiene management. Taking a realistic view, however, data on menstrual hygiene management are scarce compared to data on handwashing with soap (Joint Monitoring Programme, 2015b). Accordingly, JMP proposes handwashing with soap at home as a core indicator within the post-2015 monitoring framework (Joint Monitoring Programme, 2015b, 2012b). The proposal, however, also includes menstrual hygiene management as supporting indicator in schools and health facilities. In the case studies, the survey of hygiene practices was done by observing availability of cleansing materials, availability of hygiene pads disposal system, availability of solid waste disposal, and availability of handwashing facilities in the vicinity of the latrine. Figure 3 shows that hygiene-related issues are rarely dealt with properly. A focus on improved sanitation in Tanzania shows that risky hygienic practices are found in eight out of ten facilities; and only 0.11% of improved latrines have a handwashing device with clean water and soap (Figure 4). These results underscore that hygiene practices and menstrual hygiene management are mainly limited by the “hardware”, i.e. unavailability of waterpoints around the latrine and no access to hygienic products, which might jeopardize the potential success of hygiene promotion campaigns.

From a rights perspective, another particular area of concern relates to the issue of affordability. Sanitation facilities and services should be available at a price that everyone can afford without compromising their ability to acquire other basic goods and services (United Nations General Assembly, 2015b). However, monitoring affordability is a complex process, and there is a critical need to determine affordability standards, including for those populations that do not receive formal services. The JMP plans to use available data on household expenditure, tariffs, income and poverty to start benchmarking affordability across countries and reporting national and global trends, disaggregated by rural and urban. Specifically, one proposed solution is to use national poverty lines to benchmark household water and sanitation expenditure, e.g. “Percentage of population in the poorest quintile whose financial expenditure on water, sanitation and hygiene is below 3% of the national poverty line” (Joint Monitoring Programme, 2015b). Alternatively, Hutton (2012) suggest affordability indicators based on the ratio between sanitation and hygiene costs and overall household income or expenditure. Despite the likely utility of these monitoring approaches to measure affordability and inequalities, the exclusive use of these indicators may fail

to address the root causes behind the inability to pay. The drivers of inequalities in access are highly context- and location-specific, and the necessary policy response to guarantee access should therefore be distinct, particularly of those in vulnerable situations (Winkler et al., 2014). Issues such as ability to pay, the educational level or cultural-based obstacles are jeopardizing the enjoyment of this human right. In the surveys conducted in this study, households without their own latrine were asked why they did not have one. As shown in Figure 5, over three-quarters in Manhiça cite cost-related issues as the reason (81%). Interestingly, one out of ten households reports cultural-based obstacles, whilst in only 5% of interviewed households main reason for not having their own latrine is lack of habit to use the facility.

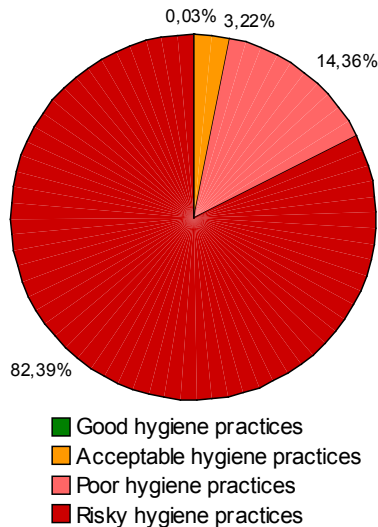


Figure 3 Quality: Hygiene practices (Kibondo)

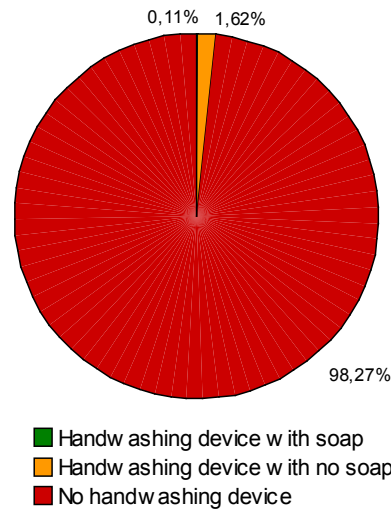


Figure 4 Quality: Handwashing device (Kibondo)

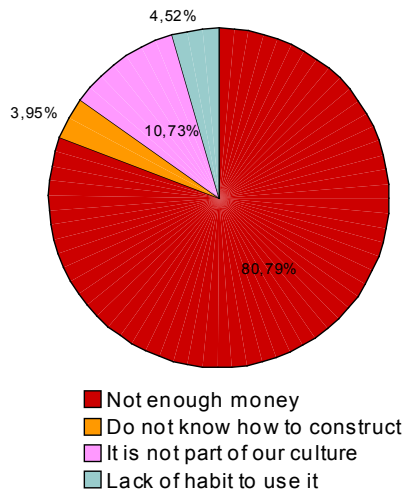


Figure 5 Affordability: Reasons for not having private latrine (Manhiça)

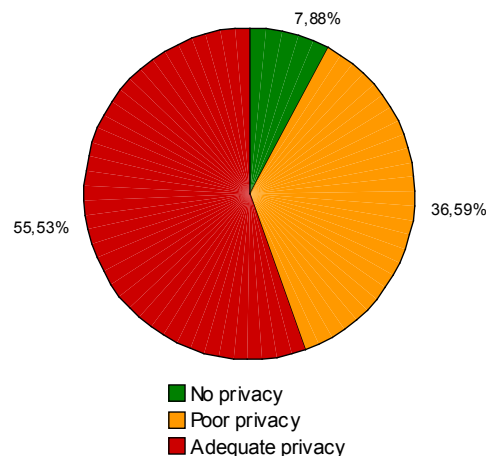


Figure 6 Acceptability: Privacy (Homa Bay)

Finally, sanitation evokes the concept of human dignity and acceptability (United Nations General Assembly, 2009; Van de Lande, 2015). The acceptability of services is important if they are to be

used, and used sustainably (de Albuquerque and Roaf, 2014). To be acceptable, construction of toilets should need to ensure privacy (see Figure 6), and in most cultures, acceptability also requires separate facilities for women and men in public places, and for girls and boys in schools. Similarly, facilities should allow for culturally acceptable hygiene practices, and particularly women's toilets would need to accommodate menstruation needs (see the discussion above). It is still unclear how acceptability issues will be considered in the post-2015 proposal.

3.3. A multidimensional perspective of the sanitation service ladder

As with the previous MDG framework, the JMP recommends to use a 'service ladder' approach to monitor progress towards the sanitation target of the SDGs. In the post-2015 proposal (Joint Monitoring Programme, 2015b), a five-rung ladder differentiates between improved facilities that are safely managed, those that are not correctly managed, and those of an otherwise improved type that are shared by more than one household. The ladder also distinguishes between unimproved facilities and households practicing open defecation. In practical terms, the proposal seeks to progressively realise the HRtS by firstly extending access to the unserved, secondly moving people up the 'service ladder', and thirdly eliminating inequalities in access (Joint Monitoring Programme, 2015b). It is therefore observed that a technology-based approach is still in place, and only the upper rung of the ladder seems to address, in part, the normative dimensions of the HRtS. In other words, the operationalisation of the normative content when determining the level of service on the lowest rungs is ambiguous, e.g. it is not clear whether a shared toilet will be "monitored" against the criteria of accessibility, safety, affordability and acceptability.

To address this concern, this study proposes a monitoring framework for measuring progressive realization for the HRtS from a multidimensional perspective. As shown in Table 4, it organises the set of indicators listed in Table 3 in a matrix structure, where all five normative criteria are assessed against four different service levels. The tool seeks to put the content of human rights obligations related to sanitation in an operational framework and, in doing so, provides guidance to practitioners looking to implement this right. Moreover, the equivalence, in terms of service level, between the proposed indicator framework and the JMP sanitation ladder is, in principle, straightforward.

It is proposed that the level of service is determined through applying a conservative interpretation of the descriptors included in each criterion. For instance, the service level of a household with access to improved sanitation which is located in the immediate vicinity is categorized as "intermediate"; to enjoy a good level of service, the latrine should be located inside the household. In turn, the overall service level is given by the worst-performing criteria. In other words, moving up the ladder would necessarily mean that the different elements of all criteria have been fulfilled. It is worth noting, however, that the information is given by the separate assessment of the

different normative criteria rather than the global figure, as policymaking will be presumably driven by the identification of specific remedial actions.

Table 5 and Figure 7 present first iteration of this monitoring tool, which has been applied at two different scales, namely the household and the community. Table 5 summarises various sanitation attributes that describe the level of service enjoyed by a given household (invented example). It is observed that the overall sanitation service level is ultimately defined by the lowest-rated indicator, namely, in this case, the suitability for use. It is gleaned from the table that the latrine is unsuitable for children, and a closer look at the “accessibility” criterion shows that in those facilities where access and use may not be convenient for all users, the level of service is categorised as “poor” (see Table 3 and Table 4). This automatically leads to categorise the sanitation service accessed by this household as “poor”. This does not mean, however, that the other criteria have not been met. For instance, the issues of availability and acceptability achieve the highest standards. This example confirms that the information is in the criteria rather than in the overall service level category.

To upscale this monitoring approach from the household to a given administrative unit, one can easily compute the proportion of households that meet a specific level of service per each criterion. In the Municipality of Manhiça, for instance, the aggregated figure that describes the sanitation service level shows that 16,6% of households have no service at all, slightly more than three-quarters (76,8%) access to poor level of service; and only 6.6% enjoy an intermediate service level (Figure 7). An accurate focus on the five sub-indices might help to identify the source of the “problem” and direct attention to those areas that require special policy attention. It is clear from the graph that major efforts in Manhiça should be undertaken to improve the quality and safety of latrine facilities, by e.g. reviewing the construction standards of toilets and/or providing a basic handwashing facility in or near sanitation infrastructure.

Table 5 Sanitation Service Level at the household scale, based on the HHRR Normative Criteria

Descriptors	Improved Latrine, located in the household	Access at all times of day and night; Safe access; Unsuitable for children	Acceptable hygienic conditions; Adequate Latrine standards; Acceptable hygienic practices; Handwashing facility with no soap; Excreta is safely disposed in situ
Service Level	Availability - Good	Accessibility - Poor	Quality - Intermediate
Descriptors	Sanitation is not affordable, but the household is not excluded from the service	The facility is culturally accepted by all household members; adequate privacy and adequate comfort	Overall Sanitation Service Level
Service Level	Affordability - Intermediate	Acceptability - Good	Overall - Poor

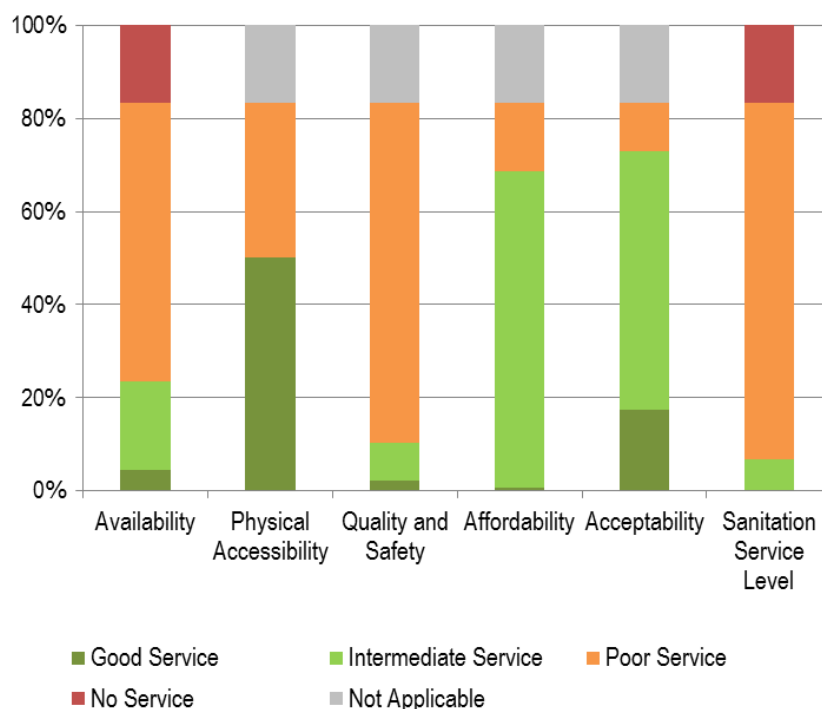


Figure 7 Sanitation Service Level in Manhica, based on the HHRR Normative Criteria

5. CONCLUDING REMARKS

The paper explores the importance of embedding human rights elements into global monitoring. It interprets the proposed post-2015 sanitation target and indicators through the lens of human rights. In particular, the analysis focuses on the normative criteria against which the enjoyment of the sanitation right can be assessed, namely availability, safety, acceptability, accessibility and affordability. It calls attention to the significant progress made in this regard during the transition from the MDG target 7c to the SDG target 6.2: i) the focus on universal access instead of halving the proportion of people with no access to basic sanitation; ii) the inclusion of hygiene,

specifically the issues of handwashing and menstrual hygiene management; iii) the focus on schools and health care facilities for extra-household monitoring; and iv) the definition of “progressive improvement”, by basing the monitoring architecture on service ladders. It also points out shortages and weaknesses: i) no clear guidance is given on monitoring inequalities and needs of disadvantaged groups; and ii) despite the concept of “progressive improvement” in relation to service level, it does not capture how progress is being made in relation to available resources and capacities. In addition, much like the MDG framework, little or no attention is paid to structural and process indicators, as the natural focus of the JMP is on outcomes. This suggests that coordination mechanisms with other global monitoring initiatives will need to be strengthened to provide a more complete picture of the context in which the sanitation services are delivered (Flores Baquero et al., 2015), such as the UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS). One important limitation of the study is the exclusion from the analysis of cross-cutting obligations related to sanitation, as participation and accountability. They should be included in a future study and discussed in the light of the findings presented herein.

On the one hand, the analysis of how well the normative criteria are integrated into the post-2015 monitoring framework shows that the achievements on this front are beyond question. For instance, an explicit effort is made to better define adequate sanitation and to include accessibility issues. The study also shows however that increased attention should be paid to ensure that sanitation services are i) hygienically safe, ii) available at a price that is affordable for all people, and iii) culturally acceptable. It is noteworthy that an important consideration in developing the proposed targets and indicators has been balancing ambition, achievability and measurability; and as acknowledged by the JMP, the need to approach the normative interpretation as closely as possible has been constrained by practical limitations as to data availability.

On the other hand, from a practitioner point of view, this article seeks to develop an easy-to-implement but comprehensive framework for monitoring sanitation services through the lens of human rights, which can ultimately inform other global monitoring initiatives. To do this, we first propose a reduced set of easy-to-use indicators to put the normative criteria in a functional framework. These indicators have then guided the development of the sanitation ladder from a multidimensional viewpoint. Complementary to ongoing JMP proposal, the proposed approach is intended as a tool to assist practitioners and policymakers with the interpretation and implementation of the level of service from a normative perspective.

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