



Measuring Progress Toward Universal Access to Water and Sanitation in California

Defining Goals, Indicators, and Performance Measures

EXECUTIVE SUMMARY

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Laura Feinstein



Pacific Institute

654 13th Street, Preservation Park

Oakland, California 94612

510.251.1600 | info@pacinst.org

www.pacinst.org

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MOST PEOPLE IN CALIFORNIA take for granted the water and sanitation in their homes. They turn the tap and clean, relatively inexpensive, abundant water flows out. They flush the toilet, and waste vanishes.

Yet there are communities in California who do not have these basic necessities in their homes. In January 2018, over half a million Californians were served by water utilities that were out of compliance with the Safe Drinking Water Act (SDWA). The worst outbreak of Hepatitis A in recent memory occurred in 2016-2018 due to open defecation and lack of handwashing facilities for persons experiencing homelessness. California's tribes continue to face problems of poor housing and water and sanitation service, with two-thirds of tribal communities reporting inadequate home plumbing in 2015.¹ And the cost of water has increased for many, particularly among small and medium size systems, with 39 community water systems in the state charging more than \$100 a month for 12 CCF of water.²

In response to the problem, California enacted the Human Right to Water in 2012, declaring that "Every human being has the right to safe,

1 California Department of Housing and Community Development, Rural Community Assistance Corporation, and California Coalition for Rural Housing. "Tribal Housing Study," in press.

2 CA Water Board. "Water System Electronic Annual Reports," 2015.



Source: J. Carl Ganter, Circle of Blue

Vicente Tapia filling buckets of water to bring home when his well ran dry during the 2012-2017 drought.

clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes."

The California State Water Resources Control Board (State Water Board) further recognized the need to address water and sanitation for disadvantaged communities when it adopted a resolution directing staff to "develop performance measures for the evaluation of the board's progress towards the realization of the human right to water, evaluate that progress, and explore ways to

make that information more readily available to the public,” and to “work with... stakeholders to develop new or enhance existing systems to collect the data needed to identify and track communities that do not have, or are at risk of not having, safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes.”

This report offers a unified framework on how to measure progress toward universal access to water and sanitation in California. Tables ES-1 and ES-2 provide an overview of goals and qualitative service indicators, while quantitative performance measures can be found in the body of the report. These service ladders offer a checklist of the numerous and disparate components of a

Table ES-1

Overview of Drinking Water Service Ladder for California – Goals and Service Indicators

		Safe	Affordable	Accessible
Goal:		Chemicals regulated by state and federal SDWA standards should be consistently below levels that pose a significant risk to health.	Cost of essential water and sanitation should be inexpensive enough that cost does not prevent access, nor interfere with other essential expenditures.	Water should be available in the home, in sufficient volumes to meet domestic needs, at hot and cold temperatures, at the times needed.
Service Indicator	Satisfactory	Water has met state and federal SDWA standards for Public Water Systems for the past three years.	Household can afford safe, accessible water without facing tradeoffs with other essential expenditures.	Sufficient hot and cold indoor piped water reliably available 24 hours a day.
	Moderate	Water has met state and federal SDWA standards for Public Water Systems for the vast majority of time in the past three years.	"	Sufficient hot and cold water from an improved source available on premises (indoors or outside) and reliably available 24 hours a day; bottled or delivered water acceptable in some circumstances.
	Marginal	Water meets standards set by US Food and Drug Administration, is treated by Point of Use/Entry filter that meets California Title 22 regulations, or meets voluntary domestic well guidelines.	Household occasionally cannot afford safe, accessible water without facing tradeoffs with other essential expenditures.	Sufficient water from an improved source, including bottled water or tanks of water delivered by truck, provided collection time is not more than 30 minutes round-trip (including waiting time), and reliably available at least 12 hours a day.
	Unacceptable	Drinking water quality that is not regularly tested and verified as meeting at least the Marginal standard for safety.	Household regularly cannot afford safe, accessible water without facing tradeoffs with other essential expenditures.	Water that does not meet at least the Marginal standards for access.

Notes: Drinking water refers to water for indoor domestic purposes: consumption, cooking, cleaning, laundry, personal hygiene, and sanitation (operating a toilet). It does not include the treatment and disposal of wastewater, which is covered in the sanitation service ladder. Improved sources of water are piped running water, protected wells, protected springs, and rainwater. Discretionary income is income minus all essential expenses but water: housing, health care, food, energy, child care, essential transportation, and taxes. SDWA - Safe Drinking Water Act.

fully-developed approach to tracking adequate water and sanitation service at the household and individual level.

The service ladders are themselves sets of recommendations for goals, indicators, and performance measures for the state to adopt. Even for those who only use this report as a starting

point, rather than a template for their work, there are general principles that can be used as guidelines for any attempt to measure water and sanitation in the state. Below we make a series of recommendations on how to improve our understanding of water and sanitation service in California and use that knowledge to improve the quality of service.

Table ES-2

Service Ladder for Adequate Sanitation in California – Overview of Goals and Service Indicators

		Safe	Affordable	Accessible
Goal:		A sanitation system should separate waste from human contact until it can be safely treated and released to the environment or reused.	Sanitation should be inexpensive enough that cost does not prevent access, nor interfere with other essential expenditures.	Toilets should be private, located in the home, safe to visit, and available when needed.
Service Indicator	Satisfactory	Flush toilet connected to a system that hygienically separates waste from human contact, where waste is safely disposed of on-site, or transported and treated off-site.	Household can afford safe, accessible sanitation without facing tradeoffs with other essential expenditures.	Private, secure, well-maintained, in-home facility, not shared with other households, available 24 hours a day.
	Moderate	An improved facility that hygienically separates waste from human contact, where waste is safely disposed of on-site, or transported and treated off-site.	"	Private, secure, well-maintained, on-site facility, possibly shared with other households, available 24 hours a day.
	Marginal	An improved facility that hygienically separates waste from human contact.	Household occasionally cannot afford safe, accessible sanitation without facing tradeoffs with other essential expenditures.	Private, secure, well-maintained facility, possibly shared with other households, no more than 50 meters from home, available 24 hours a day.
	Unacceptable	Use of unimproved facilities or open defecation.	Household regularly cannot afford safe, accessible sanitation without facing tradeoffs with other essential expenditures.	Facility is more than 50 meters from home, not available 24 hours a day, or use of the facility compromises personal safety or privacy.

Notes: Sanitation refers to the physical structure of a toilet and the infrastructure and management for safe disposal of human waste and wastewater. Improved sanitation facilities refer to equipment that hygienically separates waste from human contact, such as flush toilets, pit latrines, and composting toilets.

Recommendations on Metrics

- **Safe Water:** When tracking compliance with the California Safe Drinking Water Act, consider duration and frequency of time out of compliance in a given time period.
- **Affordable Water and Sanitation:** Consider water, wastewater, and the costs of basic non-water needs when calculating affordability, and consider both regional- and household-scale metrics.
- **Accessible Water:** Consider facets of location, volume, and availability over short and long time scales (i.e., both running 24 hours a day and resilient to drought and climate change). Update common assumptions about volumes of water used indoors to reflect declining use in California and recognize that this trend will continue as appliances and fixtures are replaced.
- **Safe Sanitation:** Consider both the adequacy of the toilet facility as constructed and the functioning of the sanitary system, which should include a centralized or on-site wastewater system that adequately treats and disposes of or recycles human waste.
- **Accessible Sanitation:** Consider proximity, privacy, security, cleanliness, and maintenance. If the toilet is shared, consider whether the number of people using the toilet is below reasonable limits.

Recommendations on Developing a Unified Set of Metrics to Inform Policy

- **Adopt a single, consistent set of indicators and performance measures, and designate a single entity entrusted with regularly assessing those metrics.** Efforts by the California Department of Water Resources to develop sustainable water management indicators as part of the California Water Plan,

the State Water Board's resolution directing staff to develop goals and performance measures as part of its Human Right to Water Portal, and the Office of Environmental Health Hazard Assessment's evaluation of the status of the Human Right to Water are all valuable efforts. Each will be more useful if they are merged into a unified framework that is employed by all stakeholders in California. The Governor should convene the appropriate cabinet secretaries to identify the lead responsible agency for assessing water and sanitation service.

- **Use a unified set of water and sanitation performance measures to direct funds and resources to the most pressing problems.** The current approach to allocating funds to disadvantaged communities relies on local actors applying for resources; it is unknown to what degree needs go unmet because local entities do not have the capacity to seek assistance. Measuring a set of drinking water and sanitation performance measures regularly would yield detailed information on the number, location, and characteristics of those households with the greatest need for improved water and sanitation services. Funds to address drinking water and sanitation problems, such as the proposed Safe and Affordable Drinking Water Fund (SB 623, Monning), should use performance measure results to identify and reach out to communities that are likely eligible for assistance.

Recommendations on the Scope and Scale of Water and Sanitation Service Metrics

- **Shift from using performance of centralized water and sanitation systems as exclusive proxies for the quality of service to also tally households and individuals that are not**

adequately served by large institutions. The Human Right to Water implies the importance of considering water and sanitation for every person. Yet for many indicators, the best or only data available are collected at regional scales – often the Public Water System or centralized wastewater system. While most people are served by these systems, many of the people without adequate water and sanitation are not. These are small, disadvantaged, and remote rural communities outside of service area boundaries, or persons within service area boundaries that are not connected to centralized systems, have an on-premises plumbing problem, or lack shelter. Regional-scale data are useful, but it is important to acknowledge its limits and to supplement it with granular information at the individual and household level when available.

- **Recognize sanitation as an essential component of the Human Right to Water.** Current statute recognizes a right to water for sanitary purposes, but does not address the other components of sanitation: a toilet for personal use, and a system for safely treating and disposing of the waste. Like safe and sufficient water, sanitation is necessary to ensure human health, prevent epidemics of water-borne diseases, and safeguard the quality of drinking water resources. Adequate water without sanitation is insufficient for meeting the overriding objective of preventing waterborne health threats from chemical contaminants and disease.
- **Measure water and sanitation services in non-residential settings.** Schools, preschools, and hospitals host high concentrations of people vulnerable to disease. Ensuring the basics of clean water, a functional sanitation facility, and a place to wash one’s hands are vital for the health and safety of children and the ill. While

this publication does not address institutional settings, this is a clear next step for further investigation.

Recommendations on Remediating Key Data Gaps

- **Investigate quality of water delivered by Very Small Systems, i.e., domestic wells.** Mapping these problems requires understanding the quality of source water as well as the treatment of the water by the well operator. If the state begins to offer more financial support for domestic well owners to test and treat their water, the program may yield useful data.
- **Identify Public Water Systems that persistently fail to deliver water that meets Safe Drinking Water Act standards.** In their present format, it is difficult to use the Safe Drinking Water Information System and the Human Right to Water Portal to distinguish temporary, one-time violations of the Safe Drinking Water Act from long-term problems.
- **Measure how many Californians face trade-offs between paying their water bill and other necessary expenses, and how often that trade-off results in long-term debt accumulation or service disconnections.** A regional-scale understanding of households likely to have difficulty paying their water bill can be gleaned from datasets on cost of living, household income, and local water rates, though the data on water rates are not complete. There is relatively little information, however, on the number of households who face difficulty paying their water bill, and almost none on whether difficulties in paying water bills results in long-term debt accumulation or service disconnections.

- **Collect information on service disconnections that distinguishes between occupied and unoccupied residences.** Community water systems typically track service disconnections, but it is not possible to distinguish between occupied households that lose service for failure to pay and unoccupied households where residences simply neglected to notify the utility when they vacated their home. Yet utilities are required to notify the occupants of a home before disconnecting service and also routinely receive communications from the occupants, offering multiple opportunities to record whether the unit appears to be occupied. Medium and large community water systems should record when service disconnections are for units that are known to be occupied.
- **Compile locally-held information on leaking septic systems or other onsite wastewater treatment systems.** Anecdotally, community organizations working with disadvantaged communities report that they serve households with improperly maintained septic systems. Information on permit violations is collected by local government entities and transmitted to the Regional Water Quality Control Boards (Regional Water Boards). The State Water Board should compile this information in a single statewide electronic database to develop a greater understanding of wastewater problems in the state.
- **Regional Water Board stormwater permits should require municipalities to collect data on publicly-accessible toilets and handwashing facilities.** Given the well-established role of universal sanitation in preventing water pollution and disease, public toilets and handwashing facilities should be regarded as a primary strategy to safeguard the quality of California’s waterways. Yet resources to improve stormwater quality have focused

on strategies to clean stormwater, rather than prevent fecal matter from entering in the first place. Regional Water Boards could alter this by placing greater emphasis on provision of public toilets to reduce fecal matter in stormwater. The first step would be to systematically collect information on location, usability, hours of public toilets, and proximity to homeless encampments.

Recommendations for Policy Solutions to Address Failures in Drinking Water and Sanitation Service

- **Use the Eligibility for Customer Assistance Program (ECAP) metric described in “Ancillary Performance Indicators for Affordable Water and Sanitation” to qualify households for a water affordability assistance program.** The ECAP metric is relatively simple to calculate, aligns with other well-established social service programs enrollment thresholds, and addresses disparities in cost of living around the state.
- **Expand CalFresh benefits to include soap for handwashing.** Lack of access to soap is a persistent problem among food-insecure families. California has recently experimented with expanding CalFresh assistance by providing a supplementary drinking water benefit for customers of public water systems with unsafe drinking water (California 2017-18 Budget, enacted June 2017). Adding soap to CalFresh benefits would be a relatively inexpensive way to ensure that low-income children obtain access to an essential component of hygiene.

We live in a time of extraordinary progress toward reducing poverty worldwide. Between 1990 and 2013, the number of extremely poor people globally fell by over a billion, even as the

world's population grew by more than one and a half billion.³ But the final steps of eradicating poverty are perennially plagued by the “last mile problem:” the pace of progress slows as a society nears the goal of eliminating extreme poverty.⁴

California is no exception. Only a small percentage of California's population lives without adequate water and sanitation, yet progress toward eliminating these last inequities is long overdue — all the more so in comparison to the magnitude of the infrastructure we have constructed to transport and treat water for the vast majority of the state's residents. But, seen from another perspective, the state's problems in ensuring universally adequate water and sanitation are surmountable. We have the resources to bridge these last gaps in service. With concerted effort, the vision of universal water and sanitation for all Californians can be realized.

3 The World Bank. “Poverty Overview.” 4/11/2018. Accessed January 9, 2018. <http://www.worldbank.org/en/topic/poverty/overview>.

4 Chandy, Laurence, Hiroshi Kato, and Homi Kharas. “The Last Mile in Ending Extreme Poverty.” Brookings Institution Press, July 20, 2015. <https://www.brookings.edu/book/the-last-mile-in-ending-extreme-poverty/>.

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