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ATHENA INFONOMICS

Water and Sanitation Vulnerability Mapping for Southeast Asia

Learning Brief Philippines

Brief Overview

Southeast Asia's efforts to achieve universal access to safe water and sanitation are undermined by persistent service gaps in vulnerable communities, **insufficient funding**, and a **lack of adaptive and mitigation strategies** to address escalating climate risks. Despite incremental progress, millions in rural and low-income areas remain underserved, with women disproportionately affected as they shoulder the burden of household water collection and sanitation management. **Fragmented service delivery**, outdated infrastructure, and **low-performing service providers** further compound these challenges, impeding efforts to build resilient WSS systems.

The Water and Sanitation Vulnerability Mapping study, led by Athena Infonomics in partnership with Water.org, highlights the critical need for **financial investment in adaptive strategies and technological upgrades** across Cambodia, Indonesia, and the Philippines. By assessing systemic vulnerabilities in service delivery and policy frameworks, the study underscores how funding constraints and fragmented service provision perpetuate inequities, limiting the sector's capacity to respond to climate risks. This learning brief, **focusing on Philippines**, presents targeted recommendations aimed at closing service gaps, strengthening financial mechanisms, and advancing technological solutions to enhance sector performance and inclusivity. Following summarizes key recommendations for addressing identified vulnerabilities in Philippines's WSS sector:

The document outlines targeted and national-level recommendations to enhance WASH access in vulnerable districts of the Philippines through Water.org's WaterCredit program. Key local interventions include microloans for household water storage, desludging services, decentralized wastewater treatment, and financial literacy campaigns.

At the national level, it recommends pooled financing for small utilities, performance-linked tariffs, blended finance models, support for small WSS enterprises, and regulatory reforms. Additional measures include incentives for smart technologies to reduce water losses, concessional loans for climate-resilient infrastructure, and a database of verified WSS technology suppliers.

Estimated funding needs are detailed for Zamboanga, Calabarzon, Eastern Visayas, and Bicol, covering technologies such as mini piped water systems with RO, protected shallow tubewells, single and twin-pit latrines with FilTo, adaptive septic tanks, and handwashing facilities like basins and SATO Taps.

Local Context

In the Philippines, **water supply services** in urban areas are mainly provided by **LGUs and Water Districts (WDs)** through **piped networks**, while rural areas rely on **communal systems or wells** managed by LGUs. The **private sector** fills urban service gaps via **piped supply, kiosks, and bottled water**, but has limited rural presence, except in **affluent developments or PPPs** with **cross-subsidies**. For **sanitation**, LGUs and WDs are responsible, though **sewerage is rare** and **septage management** is promoted through clustering approaches like **PWSSMP**. The **private sector** is mainly involved in **urban septage services**, with rural engagement occurring only through **PPP arrangements**.

92% of dwellings have access to have access to at least basic drinking water services. However, only 48% have access to safely managed drinking water service.

80% of dwellings have access to at least basic sanitation services. However, only 63% of households have access to safely managed sanitation.

3% of the population practice open defecation.

Key findings

The following section presents key findings from the province-level analysis of Philippines, with Zamboanga, Calabarzon, Eastern Visayas, and Bicol identified as priority provinces for in-depth study. Insights are organized thematically across critical dimensions, including **Service Preferences and Coverage, Climate Vulnerability, Gender-Specific Challenges, Household Financial Challenges, and Private Sector Constraints**. Each theme captures the on-ground realities revealed through the primary survey, focusing on prevailing service access patterns, user preferences, and challenges faced by households and service providers.

For drinking water

39% of households (HHs) rely on public piped water supply

58% prefer private vendors supplying bottled or canned water

3% rely on other systems (tubewells, shared wells)

For non-drinking water

70% rely on public sector

17% rely on community managed systems

8% rely on self-managed systems

4% rely on private vendors

1% rely on other systems (shared wells, jetmatic pumps)

74% of surveyed households are affected primarily by flooding and extreme weather like typhoons

Service Preferences and Coverage

Private vendors are valued for **better quality**, whereas public utilities for **affordability**.

In sanitation, **98% of households (HHs) have individual household toilets, while 2% use neighbor or shared toilets.** Of all households, **93% have toilets connected to septic tanks, and 3% discharge waste directly into water bodies, open grounds, or open drains**. Among households with septic tanks, **81% have never emptied them.** For desludging services, **29% relied on government-operated vacuum trucks, 64% on private desludgers, and 7% on other service providers.**

Climate vulnerability

Climate-related events significantly impact WSS services. As a result, **49% HH reported decreased water availability, 29% experience water contamination,** 10% report damage to **pre-existing facilities,** 7% are affected by flooding, 3% lose access to water entirely, 1% report turbid water, 1% require area clean-up, and 1% face other issues. In sanitation, **35% of HH face increased exposure to unhygienic conditions, 29% experience overflowing septic tanks or latrines,** 21% have limited water for sanitary use, and 15% report infrastructure damage. Despite these widespread disruptions, external support remains limited — only 40% of households receive any form of assistance for water (such as **clean water distribution, subsidies**), and just 16% receive sanitation-related support (such as **temporary facilities or emergency supplies**).

In 65% of households, only **females** are responsible for **cleaning toilets**, compared to 23% where both **males and females** share the task, and just 10% where only **males** do.

Gender-Specific Challenges

Women face multiple challenges in accessing **WSS services**. **15%** struggle with inadequate **sanitation facilities**, and **4%** experience **disruptions in school or work** due to **sanitation tasks**. **75%** of women report spending significant time **fetching water**, **13%** report difficulty **lifting and carrying water**, **4%** face **disruptions** due to **water-related tasks**, and **2%** struggle with **navigating and lifting water** from the source. **19%** report inadequate water for **menstrual hygiene**, and **17%** face challenges managing **menstruation** within **sanitation contexts**. **7%** face increased **health risks**.

96% of households spend an average of 10 USD **per month on water services**, while 71% spend 2.5 USD **monthly on sanitation services**.

Household Financial Challenges

The study found that Philippian households **spend an average of 5% of their income on WSS services**, surpassing the affordability threshold of 3% set by the World Bank.

Low-income households face steep **water costs up to 30 times higher** due to the absence of piped supply, **unregulated pricing**, and reliance on **intermediaries**. In **rural and water-scarce areas**, limited infrastructure, **groundwater decline**, and **system inefficiencies** further increase household expenses. Despite this, only **11%** of households cite the **high cost of water supply services** as a concern, while **6%** point to the **high cost of sanitation services**, such as toilet construction and maintenance.

20% of households have expressed a need for financial support.

While **55%** of households are aware of **financial products** like loans, grants, or crowdfunding, just **14%** have accessed them. A significant **81%** face financial challenges in accessing **WSS services** due to **irregular or insufficient income**. Of those needing financial support, only **2%** currently receive it in the form of **subsidies or grants**, and another **2%** report a lack of sufficient **financial instruments**.

Private Sector Challenges and Financing Constraints

Complementing public service delivery, the private sector plays a significant role in Philippines's WSS landscape, with approximately **04% of household water supply spending** directed toward private providers. Despite this substantial engagement, several structural and financial challenges hinder the sustainability and expansion of private WSS services.

Private providers in the **WSS sector** struggle with **high capital needs** for infrastructure development in **underserved and remote areas**, which often remain unmet. The cost of **rehabilitating aging systems** and **extending services** to **remote barangays** is steep, particularly due to high **transmission costs**.

Expanding operations into **peri-urban** and **informal settlements** is further constrained by **land tenure issues**, **lack of basic infrastructure**, and **expensive network extensions**, making service delivery in these areas difficult and resource-intensive.

Securing **water rights** from the **National Water Resources Board (NWRB)** poses a major hurdle, with delays driven by **over-allocation** and **bureaucratic processes**. Dependence on **Local Water Districts (LWDs)** for bulk supply adds further risk, as **inconsistent availability** and **public utility prioritization** frequently disrupt operations.

On the financial front, providers face **limited access to financing** due to the sector's **high-risk perception** and **strict lending conditions**. A **fragmented tariff approval process**, involving **LWUA**, **NWRB**, and **LWDs**, leads to delays in **cost recovery**.

Lastly, significant **revenue losses** from **non-revenue water**—caused by **leakages**, **illegal connections**, and **poor billing systems**—add to the financial strain. Providers have **limited access to funds** for adopting **technological solutions** and receive **no tax exemptions** or **government subsidies**, making them **ineligible for public infrastructure programs** and fully dependent on **self-financing**.

Microfinance Institutions (MFIs)

To understand the MFI landscape for water and sanitation in the Philippines, interviews were conducted with six financial institutions: **ASA, ASHI, Camalig Bank, NWTF, RAFI, and SEDP**.

Aspect	Details
Operational Areas	Luzon, Visayas, Northern Samar (urban and rural regions)
Financing Models	Group lending, risk-based pricing, calamity-linked rescheduling, LGU-aligned products
WASH Loan Portfolios	Household toilets, septic tanks, piped connections, tubewells, water filters, desludging; rainwater harvesting
Household Loans	PHP 1,000 – PHP 80,000 (~$18 – $1,400), 9 months to 10 years, 1.18% to 46% per annum (mostly 12%–30%)
Enterprise Loans	Limited; offered by select MFIs based on prior history, income, and location
Credit Evaluation	Based on loan history, income checks, and regional criteria

Aspect	Details
Critical Challenges	30% loan diversion; WASH loans not prioritized; limited expansion plans; loan officers prefer other products; lack of green officers; behavior barriers; affordability issues for 4Ps; some MFIs cite no major issues
Financial/Regulatory Barriers	Policy caps on subsidiary lending; BSP compliance; low WASH exposure; limited capacity for climate-lending products; no government involvement in some cases
Recommended market enabling forces by MFIs	Digital fund tracking; stricter monitoring; prioritize WASH in strategy; financial literacy; technical assistance; LGU tie-ups; Water.org data; community profiling; tailored products

Bridging the Gaps by Water.org

Facing challenges in the Philippines' **WSS sector**, Water.org works to bridge **financial and service gaps** by partnering with **MFIs, banks, and associations** to support **water districts**. This has reached **10.6 million people**, mobilized **$449 million**, and disbursed **2.2 million loans—97% to women**, **64% rural**, and **91% below $6.85 per capita per day**.

To understand vulnerabilities and strengthen WSS services, Water.org conducted this study, with **key recommendations** presented in the final section.

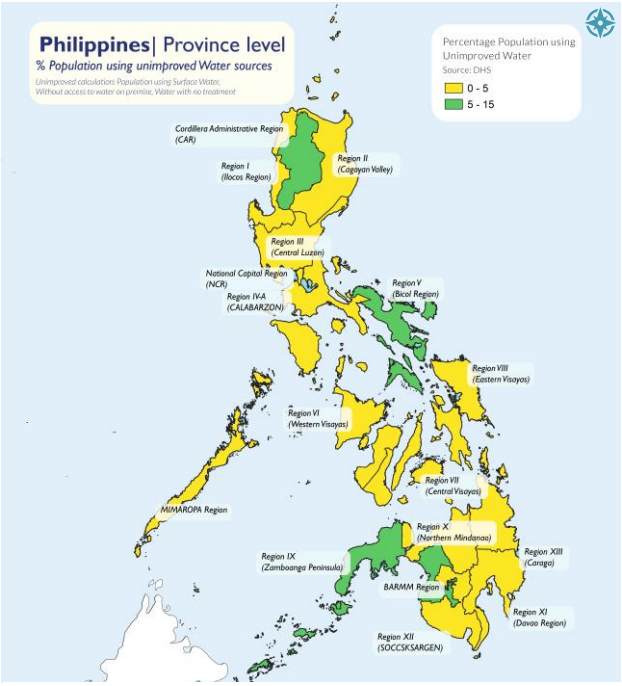


Figure 3: Regional-level access to unimproved water sources across Philippines

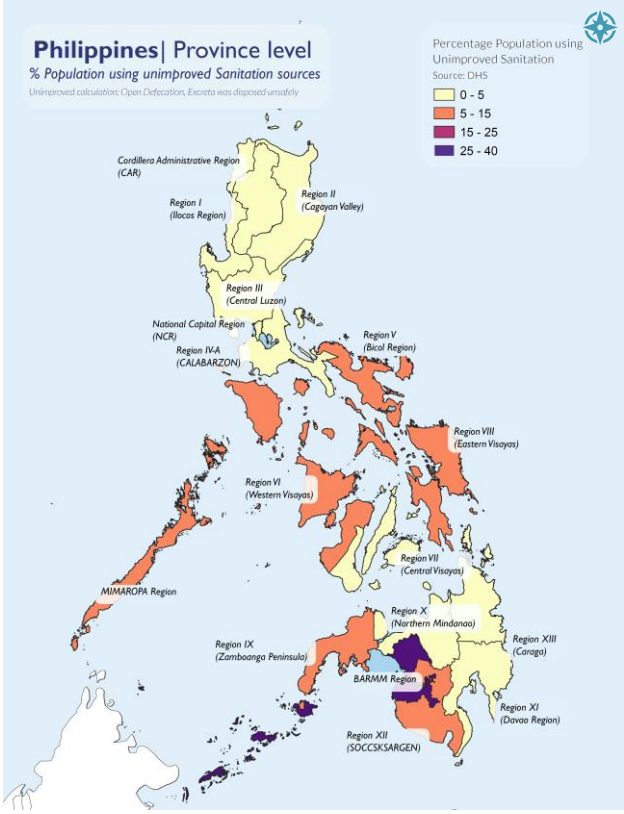


Figure 4: Regional-level access to unimproved sanitation across Philippines

Vulnerability

While the preceding section outlines critical insights emerging from primary surveys and stakeholder consultations, it is imperative to spatially contextualize these findings to identify areas of heightened risk. Accordingly, **a national-level spatial vulnerability** assessment was undertaken to delineate the provinces in Philippines where these challenges are most pronounced, based on composite indicators including coping capacity, socio-economic conditions, and demographic vulnerability.

The analysis in the following figures provides an overview of the proportion of the population using unimproved water and sanitation sources across provinces.

Based on this mapping, coupled with **stakeholder consultations and secondary data**, the regions of **Zamboanga, Calabarzon, Eastern Visayas,** and **Bicol** were identified as relatively more vulnerable. These regions were selected for deeper spatial analysis to determine localized vulnerabilities and guide the identification of **priority intervention areas** for WaterCredit.

Province-Level Spatial Assessment:

For the four priority regions, a granular province-level assessment was conducted using geospatial layers and demand estimation.

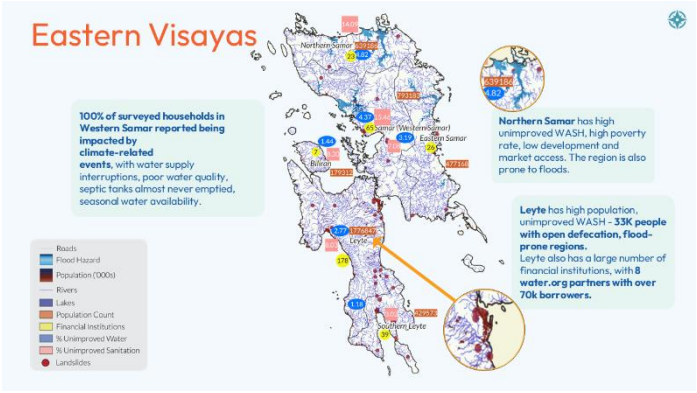


Figure 5: Province-level WASH vulnerability mapping in Eastern Visayas

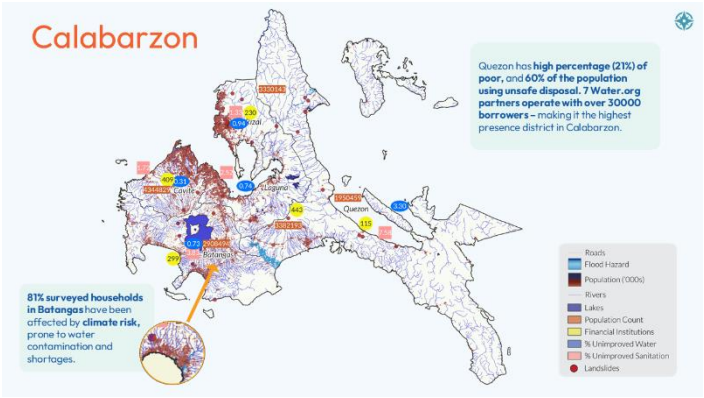


Figure 6: District-level WASH vulnerability mapping in Calabarzon

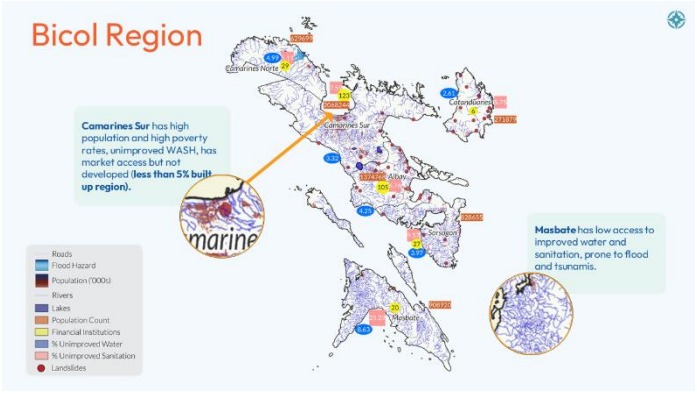


Figure 7: District-level WASH vulnerability mapping in Bicol

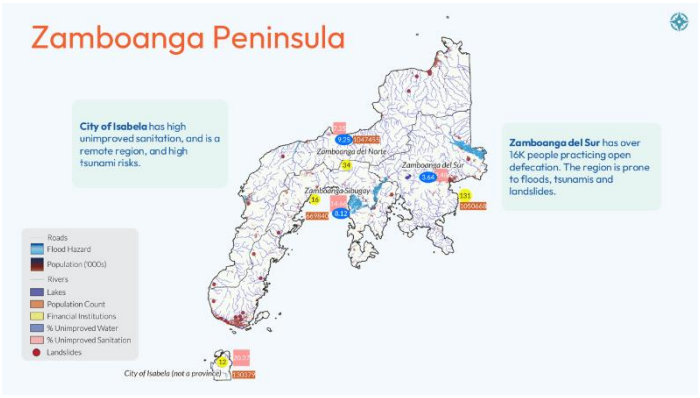
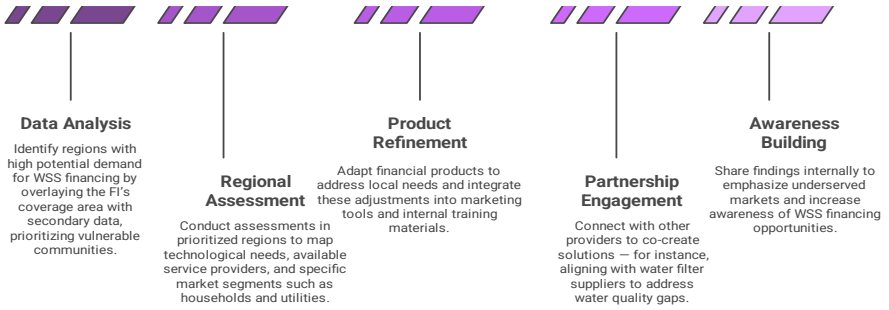


Figure 7: District-level WASH vulnerability mapping in Zamboanga

Recommendations

Bridging the WSS infrastructure gap requires substantial investment, with Philippines alone requiring $9 billion. Water.org's WaterCredit program has emerged as a critical initiative to facilitate microloans for low-income households and small enterprises to improve WSS access. For effective implementation of WaterCredit, the following actionable steps are suggested for the financial institutions:



Further, based on the learnings, the recommendations are structured into two categories:

Targeted Interventions for Vulnerable Districts:

For the 9 most vulnerable districts, interventions focus on financing mechanisms tailored to local needs. In **Zamboanga Del Sur**, where over 16 thousand people practice open defecation, prone to floods, tsunamis and landslides. The following interventions are recommended:

1. **WaterCredit for Household Storage and Purification** – Provide loans to households for water storage solutions to mitigate climate-induced water quality issues (52% affected).
2. **WaterCredit for Household Desludging Services** – Support households with financing for desludging services to address the 72% of septic tanks that have never been emptied.
3. **Awareness Campaign on Financial Products** – Educate communities on financial assistance for WASH, as 96% lack awareness.
4. **WaterCredit for Decentralized Wastewater Treatment** – Offer financing to private players to establish decentralized sanitation solutions to reduce open defecation and mitigate env. risks.

5 **Financial Literacy and Capacity Building** – Provide training on financial management to improve household affordability for WSS services.

National-Level Interventions

To ensure the long-term viability of WaterCredit and strengthen the overall WSS financing ecosystem, the following national-level interventions are recommended

1 **Pooled Financing for Small Utilities**
Facilitate collective loan access through pooled funds, municipal bonds, and concessional co-financing to improve creditworthiness and reduce costs

2 **Performance-Linked Tariffs**
Link tariff hikes to service improvements, ensure regulatory oversight, and adopt tiered pricing to protect low-income users (Example: Uganda's NWSC).
Example: Uganda Tariff Guide

3 **Co-Financing**
Use blended finance, output-based aid, and community partnerships to build infrastructure in informal and peri-urban areas. Identify blended financing models with financial institutions to de-risk investments through credit guarantees, interest rate subsidies, or loan amount grants.
Example: Kenya Pooled Water Fund

4 **Accelerated Support for Small WSS Enterprises**
- Offer certified operators easy credit access and lower collateral based on performance.
- Incentivize access non-public capital through deregulation or eased borrowing prerequisites.

5 **Tech Incentives for NRW Reduction**
Provide grants or PPP-based incentives for smart technologies to cut water losses, with rewards for efficiency and penalties for waste.

6 **Regulatory Reform & MSME Support**
Introduce single-window digital systems for project approvals and tiered licensing for small WSS providers,

linked with credit access and performance-based incentives.
Example: India's SBM facilitated fast-track approvals for desludging operators

7 **Climate Resilience Financing**
Offer concessional loans, green bonds, and climate insurance for resilient infrastructure investments (Example: Green Climate Fund).
Example: The Green Climate Fund

8 **Develop Technology Supplier Database**
Establish and maintain an updated database of quality service providers for targeted WSS technologies, accessible to financial institutions to facilitate supplier identification.

Figure 8: Images from household field survey

Funding Requirement:

Estimated Total Funding Requirement for Water Supply, Sanitation, and Hygiene under Scenario-Based Modeling for Each Identified Vulnerable Province

Province		Zamboanga	Calabarzon	Eastern Visayas	Bicol
Estimated Demand (HH)		**94318**	**35717**	**79711**	**80965**
Funding Requirement for Water Supply	Scenario 1: All Urban households to be connected to Municipal Piped Water Supply + All Rural households to be connected to Protected Shallow Tubewells	$13,617,704	$5,156,819	$11,508,681	$11,689,683
	Scenario 2: Mini Piped Water System with RO for Medium, Fourth and Highest Quintile + Protected Shallow Tubewell for Lowest and Second Lowest Quintile	$19,436,400	$7,812,913	$16,847,886	$16,969,473
Funding Requirement for Sanitation	Scenario 1: Single Pit with Offset and FilTo for Lowest and Second Lowest Quintile + Twin Pits for Medium Quintile + Adaptive Septic Tank considering Flood Resilience for Fourth and Highest Quintile	$21,973,662	$16,084,931	$25,722,038	$22,699,992
	Scenario 2: Single Pit with Offset and FilTo for Lowest and Second Lowest Quintile + Twin Pits for Medium Quintile + Septic Tank with Soak Pit without consideration of flood for Fourth and Highest Quintile	$20,672,538	$14,231,684	$23,373,830	$20,970,586
Funding Requirement for Hygiene	Installation of Handwashing Station (Basin) for Highest, Fourth and Medium Wealth Quintile + SATO Tap for Lowest and Second Quintile	$1,885,615	$1,757,097	$2,565,261	$2,275,189

** Both twin-pit and single-pit latrines are recommended to be constructed with a raised platform and a secure lid to enhance climate resilience*

MFI Funding Requirement

- **Fourth and Highest Quintiles**: Excluded — can afford services without support.
- **Lowest and Second Quintiles**: Not suitable for MFIs — better targeted by DFIs and subsidies.
- **Middle Quintile**: Ideal target for MFIs — capable of borrowing and repaying.

Funding Requirement for Medium Quintile		Zamboanga	Calabarzon	Eastern Visayas	Bicol
Water Supply Tech.	MPWS, If available	$997,229	$803,775.10	$1,260,311.38	$1,390,082.95
	Mini Piped Water System with RO, if MPWS not available	$2,292,600	$1,847,854.11	$2,897,416.88	$3,195,757.70
Sanitation Tech.	Twin Pits	$2,518,775	$2,030,153.61	$3,183,260.69	$3,511,034.25
Hygiene Tech.	Handwashing Stations	$606,562	$488,894.14	$766,581.15	$845,514.37
Total		**$6,415,167**	**$5,170,677**	**$8,107,570**	**$8,942,389**