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Inadequate WASH Infrastructure among Rural Populations in the Pacific Islands

By Olivia Wallgren

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Summary+

Water, Sanitation, and Hygiene (WASH) are key aspects for development that allows families to live clean and healthy lives. However, many regions of the world, including the Pacific Islands Region, do not have proper facilities and funding to build or maintain WASH infrastructure, especially in rural areas. About 45% of rural Pacific Islanders lack access to adequate sanitation and 13% lack access to basic drinking water. Natural disasters, climate change, insufficient government action, and difficult geographic features make developing WASH infrastructure challenging. Inadequate WASH infrastructure increases the prevalence of disease and negatively affects the ecosystems of the islands. While these challenges are daunting, certain nonprofits and organizations are creating eco-friendly toilets designed to safely dispose of waste to keep people and the environment safe.

Key Takeaways+

- Many international government agencies, such as the World Health Organization, have made WASH infrastructure and public health a priority for developing countries.
- Sixty-two percent of the Pacific Islands Region is rural, and those populations lack resources and funding for WASH infrastructure.
- Climate change increases tropical storms in the Pacific Ocean, which leads to flooding and water contamination.
- According to Transparency International, about 32% of Pacific Islanders report paying bribes to corrupt government officials for public services, including water and sanitation. These practices hurt the funding of WASH infrastructure by diverting money from sanitation and clean water projects.
- Inadequate WASH infrastructure leads to contaminated soil and water which increases the likelihood of contracting diarrheal infections and diseases. An estimated 205,21 deaths (per 100,000 people) died from diarrheal disease in 2019.
- Inadequate WASH infrastructure has led to toxins leaking into the island ecosystems causing algae blooms and negatively impacting fish populations.
Sanitation—Sanitation infrastructure refers to the safe disposal of human excreta, including the process of emptying, transporting, and treating. Improved sanitation infrastructure is defined as facilities that separate excreta from initial human contact but may not protect others who come across the feces from harmful disease. For example, when someone defecates in a pit toilet that is not sealed, the feces could seep into groundwater and infect the water supply with harmful pathogens. There are many different measurements of sanitation according to how safely disposed of the human waste is, but the World Health Organization (WHO) and United Nations International Children's Emergency Fund (UNICEF) use the following guidelines and definitions:

**SANITATION LADDER**

- **SAFELY MANAGED**
  - Use of improved facilities that are not shared with other households and where excreta are safely disposed of in situ or removed and treated offsite.

- **BASIC**
  - Use of improved facilities that are not shared with other households.

- **LIMITED**
  - Use of improved facilities that are shared with two or three households.

- **UNIMPROVED**
  - Use of pit latrines without a slab or platform, hanging latrines or bucket latrines.

- **OPEN DEFECATION**
  - Disposal of human feces in fields, forests, bushes, open bodies of water, beaches and other open spaces or with solid waste.
Hygiene—The proper practices of handwashing, bathing, food preparation, having clean clothes and bedding, proper animal care, personal care, and having proper nutrition necessary for cleanliness and health.³

Safe Drinking Water—Safely treated water (free from pathogens or dangerous chemicals) to be used for food preparation, hygiene, and consumption purposes.⁴ There are many different measurements of drinking water according to how safe the water is to drink, but the World Health Organization (WHO) and United Nations International Children’s Emergency Fund (UNICEF) use the following definitions:

Pacific Islands Region—The region specified as the thousands of islands and atolls (small ring-shaped islands) in the Pacific Ocean. These cultures and nations often span several islands. This brief will refer to the islands of Fiji, the Solomon Islands, Vanuatu, Samoa, Kiribati, Tonga, the Federated States of Micronesia, Palau, Niue, the Cook Islands, the Marshall Islands, Tuvalu, Nauru, and Tokelau.⁵

Corruption—Behavior from government officials or businesses to benefit themselves at the expense of the public. Corruption can take many forms; politicians or government officials can demand money or favors in exchange for services and pocket the money for themselves. Corporations may bribe public officials, which is also a sign of corruption. Other instances of corruption occur when politicians misuse funds, give jobs to friends or supporters rather than people of merit and participate in fraudulent deals.⁶

Rural Populations—Rural populations are groups of people that live in sparsely-populated areas of a country that are far from major cities, but the exact measurements of rural populations differ for every country.⁷ The World Bank measures rural and urban populations according to each country's guidelines, so this brief will use the World Bank's database for rural-urban population numbers.⁸
Topography—The arrangement of an area’s natural and artificial physical features.9

Salinization—The increase of salt concentration in soil. Salinization can affect agriculture and drinking water.10

Climate Change—Long-term shifts in temperatures or weather patterns. The current scientific consensus is that human fossil fuels, which were used in mass starting in the 1800s, led to the most recent changes in the global climate today.11

Diarrhea—The loss of water by passing three or more loose stools per day. It is a symptom of many bacterial, parasitic, or viral diseases, and it can be dangerous for those infected if they become dehydrated.12

Child Mortality Rate—The rate of children that die before they reach the age of 5. Usually put in terms of per 1,000 population (for instance, 5.5 per 1,000 children).13

Context

Q: What is adequate WASH infrastructure?

A: WASH infrastructure involves the buildings, personnel, funding, and resources necessary to sustain systems of water, sanitation, and hygiene in a community. Given this definition, this brief will refer to both the physical structures related to these systems as well as the services they provide. Adequate sanitation infrastructure is defined as facilities and services meant to safely empty, transport, and treat human waste, like a pit latrine or a composting toilet.14 Safely-managed sanitation requires a higher standard of sanitation than just adequate sanitation, and is defined as facilities that are not shared with other households and where feces are safely disposed of on-site or transported and treated off-site.15 Safely-managed sanitation is the cleanest and most effective form of sanitation (according to World Health Organization Standards). Practically, a household septic tank with a flush system that is transported to a treatment facility is recommended.

An improved water source is defined as treated water used for food preparation, hygiene, and consumption purposes that is free from disease-causing toxins. This can include piped water, boreholes or tube wells, protected dug wells, protected springs, rainwater, and packaged or delivered water.16 However, these resources are not all considered safely-managed water. Safely-managed water is also free of contamination.
Adequate hygiene focuses on disease prevention through practices such as hand washing, regular bathing, contact with only clean animals, and promoting regular doctor appointments for children, all of which are promoted by community leaders and healthcare workers. Hygiene is difficult to measure, thus most statistics on hygiene focus on the number of people that regularly wash their hands with soap and water.

Q: Why specifically focus on the Pacific Islands Region (PIR)?

A: The Pacific Islands Region (PIR) refers to the developing island nations of Fiji, the Solomon Islands, Vanuatu, Samoa, Kiribati, Tonga, the Federated States of Micronesia, Palau, Niue, the Cook Islands, the Marshall Islands, Tuvalu, Nauru, and Tokelau. Although some of these countries in the region are improving sanitation and health measures, the region as a whole still needs to improve WASH practices to promote healthy human development, especially in rural areas. In 2020, 14.45% of the world lacked access to improved or adequate sanitation. Safely managed sanitation is a higher standard of management for sanitation infrastructure that is not available to 48.06% of the world’s population. While some countries in the PIR are better than the world average in access to improved sanitation, countries like Vanuatu, the Solomon Islands, and Kiribati have a higher percentage of their populations that are without adequate sanitation compared to the world.

In the PIR, there is not sufficient data that would estimate the levels of safely managed sanitation, but the data trend would suggest that the percentage of safely managed sanitation is lower than the improved sanitation measurement.

Q: Who is most affected by poor WASH infrastructure?
According to the World Bank, in 2015, only 87% of urban residents in the Pacific Islands Region had access to adequate sanitation, compared to 55% of rural residents in the PIR that have access to adequate sanitation. Rural populations are populations of low density that generally live far from major cities, but the measurements of rural populations differ for every country. Many rural people living in the Pacific Islands Region live in conditions where they either have access to poorly-managed toilets that are not improved sanitation or practice open defecation. Open defecation is the practice of depositing human feces outside with no access to improved feces disposal systems. Regarding water access, 97% of urban citizens have access to clean water in their households, and only 87% of rural citizens have access to clean water. However, these statistics do not take into account that many “improved” services are still not ideal, and most rural populations have only surface water that must be cleaned before use or consumption. The best water source would be safely-managed drinking water which is usually piped water into the home, but only about 20% of the population (urban and rural combined) actually has such commodities in the PIR. Because 62% of the population of the PIR was rural in 2015, the majority of people live in areas with weak WASH infrastructure.

**Q: What does WASH infrastructure look like in rural areas?**

In a 2017 conference, the Asian Farmers Association for Sustainable Rural Development (AFA) said that rural development is neglected by governments and international bodies when it comes to information, access to information and finances, and general infrastructure, which leaves rural populations behind their urban counterparts. To get clean water, rural populations in the PIR often utilize groundwater, limited fresh surface water, and rainwater collections instead of utilizing treated water. While they have access to basic water needs, they do not have the highest standard of safely-managed water that is more available in urban areas. The World Health Organization noted in their review report of the PIR that many facilities in rural areas do not have latrines to wash hands with soap and water. For example, the mostly rural islands of Vanuatu have limited access to handwashing, with only 25% of Vanuatu’s population having access to handwashing facilities in 2017.

The majority of Pacific Islanders, about 52%, have unimproved sanitation. This means that sanitation facilities are usually shared among multiple households, and there is no proper treatment to separate human waste or avoid future contamination. However, these groups of people do have access to at least pit latrines that keep people away from direct contamination and open defecation. Another 13% of the PIR population openly defecates in the outdoors, and most of those families live in rural areas.
Q: Who is responsible for building and maintaining WASH infrastructure?

A: The national governments of the PIR are the main providers of WASH infrastructure. Government ministries also provide sanitation guidelines for local resources and are in charge of hiring personnel to maintain water pipelines and treatment facilities. Governmental bodies usually work with international organizations like WHO to adhere to guidelines for WASH infrastructure. Although today there is foreign investment in the region, there is not as much foreign investment as in other nations, such as the heavily trafficked Caribbean Islands Region. In 2020, Caribbean island states received $2.89 billion in direct foreign investment and development aid, whereas Pacific Island nations received only $1.371 billion. Since there is not a history of large-scale tourism and migration to the PIR that would incentivize WASH development there, PIR governments had a later start to developing WASH infrastructure than other developing nations such as the Caribbean islands. While in recent years, the amount of development assistance in the PIR has increased to exceed the Caribbean region, foreign aid remains low, thus the region remains underfunded.

Q: What have members of the PIR or the international community done to address inadequate WASH infrastructure?

A: While basic sanitation and water measures have always been important aspects of public health, the United Nations (UN) first set WASH goals in 1981 to improve the quality of life for people around the world. Since then, other international institutions have helped to support these goals. However, from 1990-2015 there was only a 2% increase in adequate sanitation coverage in the PIR, according to the World Health Organization (WHO). During that same time frame, there was no increase in access to piped water, which remained at 20%. Surface water as the source of water also sat at approximately 34%. While there are many obstacles to meeting water and sanitation standards universally, it has been a top global priority to increase public health for decades. Many countries attempt to make changes through new pieces of legislature. In 2014, Fiji made changes to its constitution so that drinking water and sanitation would be constitutional rights for Fijian citizens. As a result of this change, Fijian officials reviewed and revised existing water laws for efficiency, and the government allocated $5 million to water and sanitation services for the 2014 budget. While it is difficult to determine how much impact the legislation had on water and sanitation services because of a lack of
government data collection, Fiji Sun reported that 78% of Fijians had access to improved drinking water, which was an improvement from 47%. However, it should be noted that both of these statistics come from different sources that are not verified by reputable sources, such as the Fijian government or the World Health Organization.

**Contributing Factors**

**Natural Disasters, Weather, and Climate Change**

Natural disasters on the islands create unsanitary conditions which restrict access to safe water and make it difficult to implement adequate WASH infrastructure. The Pacific Island Region (PIR) is highly susceptible to natural disasters such as cyclones, droughts, earthquakes, volcano eruptions, tsunamis, and floods. A large number of natural disasters occur in the PIR because it rests upon several tectonic plate faults and is subjected to tropical ocean storms in the Pacific Ocean. While the number of natural disasters varies from country to country, every country in the region has experienced at least 1 natural disaster in the past decade. Some countries, such as the Solomon Islands, have experienced up to 13.

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Rural populations, which are especially vulnerable to natural disasters because of distance from the resources provided by big cities, must constantly rebuild their villages and facilities after these disasters destroy existing infrastructure. One natural disaster known as “Tropical Cyclone Evan,” which struck Samoa in 2012, demonstrates how much damage can be done to WASH infrastructure and how expensive it is to rebuild after a disaster. Cyclone Evan caused total damage and losses of approximately $210 million.\(^{49}\) Another report of the same storm, which evaluated damages done to WASH infrastructures, estimated that 15,900 Samoan tala (€7.01 million) was lost in WASH infrastructure.\(^{50}\) Because Samoa’s GDP averaged about $640 million, the total damages caused by Cyclone Evan were worth about 33% of Samoa’s GDP, making the recovery process nearly impossible for Samoa’s government.\(^{51}\) Most of the money to rebuild came from international investment since the Samoan government had insufficient funds to do so itself. In a 2014 follow-up report of the cyclone, the United Nations mentioned the improvements and funding of bridges, roads, and agriculture, but there was no mention of WASH infrastructure recovery.\(^{52}\) While other sectors were being rebuilt, WASH infrastructure was not being addressed immediately.

A certain weather phenomenon occurs in the PIR every 3–5 years called El Niño. El Niño in the PIR is associated with unusually hot and dry weather, which causes disruption of ocean ecosystems and extreme drought.\(^{53}\) El Niño creates two major problems for sanitation and water systems. First, there is a drought that creates salinization. This is the process for when the water becomes too saturated with minerals and is no longer safe to drink.\(^{54}\) Because rural populations often use groundwater as a water source, salinization poses a significant threat to their ability to access fresh drinking water. Extreme droughts and salinization have become more common in recent years and have caused both the Federated States of Micronesia and the Marshall Islands to declare a state of emergency during the 2015–2017 El Niño induced drought.\(^{55}\) Second, excessive flooding increases the risk of waterborne pathogens from sewage systems that cause disease. Waterborne pathogens such as viruses, parasites, and bacteria come from human feces, and when excessive flooding occurs, sewage spills can spread the disease around.\(^{56}\) Fiji has had extreme flooding in 2004, 2009, twice in 2012, and again in 2014, which led the government to declare a state of emergency in every instance.\(^{57}\) The salinization and excessive flooding caused by El Niño exacerbate the problem of maintaining adequate WASH infrastructure.

Additionally, climate change creates rising sea levels that increase the likelihood of seawater infiltrating bodies of freshwater, or salinization.\(^{58}\) Because of deforestation and rising sea levels, coastal erosion causes island coasts to erode away into the ocean, and island water sources become tainted.\(^{59}\) The El Niño pattern is expected to get worse as climate change progresses, which will lead to more droughts and more tropical storms that could exacerbate coastal erosion, drought, and salinization.\(^{60}\) One of the most vulnerable island nations is Kiribati, which consists of very rural and low-lying atolls in the Pacific. The World Health Organization used satellite data that showed the sea level had risen as much as 9.6 cm since 1993.\(^{61}\) While this increase is minute for larger countries, the islands are only about 1–2 meters above the ocean. Kiribati, and other Pacific Islands, will be endangered if increased temperatures cause sea levels to rise even more. WASH infrastructure fails to protect current water resources or divert treated water to
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households, so when sea levels rise, they will be even more vulnerable. Seawater flooding can also spread human feces from open defecation to other parts of the islands, which creates unsanitary living conditions. Natural disasters, made worse by climate change, constrain the expansion of WASH infrastructure in the Pacific Islands Region because they create unsanitary conditions for people and diminish their freshwater supplies.

**Insufficient Government Action**

The PIR fails to maintain WASH infrastructure in part because of insufficient or corrupt actions among civil servants and government officials. First, high-level officials do not appropriate adequate and efficient resources, personnel, and money to develop WASH infrastructure, especially among rural populations. Second, households must pay bribes to lower government personnel to receive WASH resources such as water and sanitation.

Governments do not effectively invest in rural communities because the cost of maintaining and building in these communities is expensive, and the islands are farther away from growing urban centers which are a priority for PIR countries. UNICEF estimated that from 1990 to 2015, the rural populations that lacked sanitation coverage increased by 70%, while urban populations that lacked sanitation coverage stayed roughly the same. The aforementioned data shows that urban communities have greater access to safely-managed WASH infrastructures such as toilets, water treatment facilities, and places to clean themselves and wash hands. Furthermore, UNICEF noted in their report of the PIR that the smaller, rural islands that are farther from cities have less access to public services, including water and sanitation services. This is partially due to corruption and the lack of data gathered from these areas by their respective governments, especially in the nations that have lots of small islands, such as Vanuatu. Without effective government action and investment in rural WASH infrastructure, the people living in these communities will continue to be affected by disease and the lack of clean water.

While government investment into WASH services can help rural development, government corruption indirectly contributes to lower investment in WASH infrastructure than was originally intended. Corruption takes many forms, but one study by Transparency International indicated that people paid more for their sanitation and water services because corrupt officials were asking for bribes. Not only do 61% of citizens in the Pacific Islands believe that their government is corrupt, but about 32% of those respondents said that they recently paid a bribe to receive public services, and 25% of those bribes are attributed to water.
sanitation, and electricity services. While governments might be reporting that they are spending money on WASH infrastructure, some are actually pocketing the money for themselves. The 2021 Corruption Perceptions Index, an internationally recognized measurement of corruption, also gave several PIR countries scores that indicated high levels of corruption. A low score means there is high corruption, and a high score means there is low corruption. Vanuatu scored 45 (out of 100), the Solomon Islands scored 43, and Fiji scored 55. This creates a problem of inefficiency and also decreases investment in WASH infrastructure. It is difficult to determine how much money is being lost from corrupt schemes in government, and Transparency International's survey was one of the first that studied the PIR. While more research and studies on corruption would be needed to combat corruption fully, it is certainly a growing concern for human rights groups and the people of the PIR who want access to basic WASH infrastructure.

**Difficult Topography and Geography**

The vast distances between islands and their rough features of mountains and low-lying atolls make WASH implementation particularly difficult in the PIR. The difficult terrain and geography of the PIR increase the costs of building infrastructure, and the remoteness of the area combined with a low population leads to a lack of funding for big projects to reach rural populations. The population of the PIR is both smaller and more dispersed compared to other island nations such as the Caribbean. In 2020, about 80% of the population in the PIR was rural, while about 48% of the population in the Caribbean was rural (a decrease from 2015 statistics mentioned earlier, 62% in the PIR and 49% in the Caribbean). Having many rural islands limits access to the main islands that have more people and resources. For many nations, including the PIR, having a large rural population is problematic because the costs of creating infrastructure for rural areas are more expensive per person. UNICEF also reported that the rural islands are isolated from the main urban centers, causing rural-urban disparities in WASH infrastructure. This affects how humanitarian aid, medical resources, and educational facilities are distributed, which may be difficult for those who live on the more remote islands. For example, the Solomon Islands has more than 300 habitable islands that stretch across more than 900 mi. (1448.4 km.) of ocean space, making it difficult for underdeveloped regions to have trade and connection with the main islands. Therefore, the budgets of the already struggling governments are further constrained in how many basic needs they can provide to their citizens. This distance, combined with low population density, increases costs for infrastructure, including WASH systems. Additionally, the distance and difficulty associated with building WASH infrastructure in rural places discourage governments from developing WASH infrastructure.
Another difficulty is that the rural topography of the Pacific islands varies wildly within the region and even within the same country. For example, the Solomon Islands has over 900 islands, and some of them are mountainous, while others are low-lying islands called atolls that are only a few meters above the water. Samoa consists of two volcanic mountain islands, and about 82% of the population is rural. Kiribati is also an island, but it has 32 low-lying atolls, and 44% of the population is rural. Tonga has more than 100 different raised or mountainous islands, and about 77% of the population is rural. While figuring out exact costs for different rural islands in the region can be difficult, UNICEF observes that these unique topographic features average higher costs for building infrastructure in remote areas such as the Pacific Islands Region. Both the remoteness and topography of the region make building WASH infrastructure more expensive and difficult to maintain.

Negative Consequences

Increased Prevalence of Disease and Mortality

Across many PIR nations, poor water quality and unsanitary conditions result in relatively high levels of dengue fever, cholera, and typhoid fever. Inadequate WASH systems are one of the main influencers of these diseases because these systems leave water and food contaminated. Disease prevalence also increases when human feces remains untreated, which affects water supplies, and when households practice poor hygiene, such as the lack of handwashing and bathing.
Hand washing, an important practice for hygiene, is low in the PIR. There are some missing statistics for the region as a whole, but the World Bank estimated the proportion of reported handwashing with soap and water in Kiribati, Vanuatu, the Solomon Islands, and Samoa. In Kiribati, the rate is about 55%, in Vanuatu, it is 25%, and in the Solomon Islands, it is 78%. While estimates are scarce for rural places, experts at the World Bank suppose the rural estimates to be lower than the rate of the total population.

Poor sanitation, drinking water infrastructure, and hygienic practices can lead to diseases such as diarrhea. Diarrhea is a symptom of bacterial, viral, and parasitic diseases that cause infection in the body. Infections come from contaminated food and water, or they are spread from person to person. In the PIR, about 52% of all diarrhea cases are caused by inadequate WASH systems. While there have been some improvements over the past few decades, there are still high rates of death from diarrheal diseases. In 2019, the region as a whole experienced 205.21 deaths per 100,000 from diarrheal disease. For comparison, the 25 European countries combined had 9.19 deaths per 100,000 from diarrheal disease. This shows that the PIR is behind where it needs to be to match developed nations in trying to reduce preventable diseases caused by unsanitary conditions and contaminated drinking water.

UNICEF and WHO reports of the region concluded that it is hard to assess mortality rates in rural areas because many infant deaths go unrecorded. However, they also suggested that there is evidence of a correlation between lower rates of adequate sanitation, clean water, and hygienic practices in rural or outer islands that increase neonatal mortality rates. UNICEF reported that 8.8% of all neonatal deaths in the region are directly caused by diarrhea. The high prevalence of disease due to inadequate WASH systems also contributes to higher rates of mortality for children under 5. Water quality, sanitation, and hygiene are lower in rural areas, and disease is more likely to cause death because of the lack of direct access to healthcare in rural areas. Child mortality and neonatal mortality are relatively high in the Pacific Islands Region when compared to neighboring countries. According to a UNICEF report in 2015, there are, on average, 27 deaths per 1,000 live births in the PIR. One of the highest neonatal death rates is in Kiribati, at 44.6 deaths per 1,000 births. New Zealand, a developed island nation, had only 4.3 deaths per 1,000 live births in 2015. Rural populations within a country, though there is a gap in data, are estimated to have higher rates of neonatal deaths than urban populations. In 2012, a WHO health service delivery profile for the Cook Islands suggested that the remote outer islands have significantly higher rates of under-5 child mortality compared with Rarotonga, the main island and seat of the capital city.

Environmental Degradation

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Having inadequate WASH practices leads to excessive pollution from human waste. These two things affect the ecosystems and biodiversity of islands, and they affect the livelihoods of those who live off of the land through agriculture, especially in rural islands that are already at an economic disadvantage from being farther from the urban centers. Heavily polluted waters due to poor water treatment facilities and the prevalence of open defecation have major effects on ecosystems and animal life. Human feces produce many toxins that make their way into rivers and oceans, and an abundance of them can cause infections that lead to death for aquatic life. From a test of Tuvalu coastal waters, scientists determined that high levels of certain high-acid minerals and metals were found in the coastal reefs of atolls. While they were also prevalent in urban areas, rural locations with poor sanitation facilities and infrastructure also found harmful levels of these metals. As a result, the ecosystems and biodiversity of coral reefs can be damaged by the high levels of these minerals.

Ecosystems are also greatly affected by practices of open defecation, which is commonly practiced in the rural pacific islands because toilets and sanitation facilities are scarce. A study about countries around the world indicated that poor WASH infrastructure and open defecation leads to higher levels of nitrogen, phosphorus, and fecal bacteria, which are dangerous to the environment. The PIR region was shown to have some of the lowest levels of human waste pollutant removal. This means that sanitation facilities and personnel were failing to remove the human waste pollutants that were entering the environment after defecation. High levels of pollutants are shown to decrease oxygen in rivers or streams, which causes fish to die. These pollutants can also lead to harmful algae blooms, which also affect ecosystems of aquatic life by blocking the sunlight and depleting the environment of nutrients for other plants and animals to thrive. In 2015, the Solomon Islands had only been removing about 4.8% of human waste contaminants produced during the year in sewage treatment facilities, and Fiji had only been removing 3.1% during the year.

While there is research on the matter, many scientists are also concerned with the future environmental effects of poor sanitation on the PIR. Some are worried that poor WASH infrastructure leads to decreased agricultural yields because of human feces pollution in the environment. The feces affects the soil when it is not treated correctly and ruins it for crop growth. When feces goes into the ocean, fish die, and those who rely on fishing for food and income suffer as well. Because their agriculture is being affected by polluted waters, it will become harder for rural people to sustain themselves. International groups such as
the United Nations have also expressed their worry that without drinking water and sanitation resources that can handle the stress of climate change, rural populations and people from outer islands could end up having to leave their homes.93

Best Practices

Sanitation First

Sanitation First is a non-profit organization working in India to build and distribute eco-friendly toilets to those in need. These toilets are designed to separate solid and liquid feces that will be used as fertilizer for crops. The toilets keep the waste from contaminating drinking water by dehydrating and decomposing the feces with dry ash and a sealed storage area. This process also kills pathogens and prevents insects from reproducing in the feces. The toilets are beneficial because they keep feces from spreading disease, they create useful compost for agricultural purposes, and they can be easily built to accommodate different situations. These toilets are less expensive than traditional sanitation infrastructures such as septic tanks or sewage systems, and they also can be constructed in both urban and rural locations. Sanitation First also works to train schools on the importance of personal hygiene and female menstruation hygiene.94 While this organization is not currently in the Pacific Islands Region, this eco-friendly technology could be adapted to meet the sanitation needs of the Pacific Islands.

Evaluation

Sanitation First has been an active organization since 1998. On their website, Sanitation First measures their work in India using outputs. As of 2021, it has built 5,001 toilets, recorded that 55,867 people use these toilets, and produced 13,530 tons of compost with the toilets. The organization has also built 158 stalls of toilets in schools. While this NGO is not formally vetted, the leadership team consists of many experienced entrepreneurs that have worked in non-profits before.95 While there are positive achievements, Sanitation First currently lacks statistics and impact evaluations on their services. If Sanitation First took more statistics about how many toilets are maintained over time or how many different villages the organization works in, then their credibility might be strengthened even further because they would be showing accountability through records. The organization lacks impact.
measurements, and measuring the impact of the organization compared to locations where the organization doesn't work would show how the organization is affecting the livelihoods of people. For example, the organization can measure if people who have toilets are less likely to contract a disease. Overall, the toilets designed by Sanitation First could provide promising solutions to improve sanitation in the Pacific Islands Region.

Asia - Pacific Islands

Olivia Wallgren

Olivia is a senior pursuing a degree in International Relations. She has a passion for the small corners of the world which led her to learn more about and promote social, economic, and political issues in areas that are hardly talked about, such as the Pacific Islands Region. Since she can't possibly travel to every corner of the world, her plan is to go to law school to help marginalized communities in the United States.