



# Boosting business: why investing in water, sanitation and hygiene pays off

Tea estates in India

Impact report

WASH  
4WORK

TWININGS<sup>TM</sup>  
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WaterAid

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# Executive summary

Having safely managed water, sanitation and hygiene (WASH) infrastructure in the workplace is vital to business performance and success. These essential services are foundations for the health and well-being of employees, reducing medical and sick pay costs, and boosting staff motivation and productivity.

WASH considerations should be included in a company's water stewardship strategy and seen as an opportunity to strengthen operational resilience and performance. WASH investment is also a way to build brand perception value and mitigate supply chain and climate risk, while addressing a whole host of environmental, social and governance (ESG) criteria.

*Boosting business: why investing in water, sanitation and hygiene pays off* is a first-of-its kind pilot research project measuring the return on investment (ROI) and other business benefits of improving WASH services and behaviours in the workplace and employees' communities.

In collaboration with Diageo, Gap Inc., HSBC, Twinings and ekaterra (which was part of Unilever when this project started), WaterAid has measured the tangible impact of WASH investment in ten workplaces across four countries. This includes tea supply chains in India and Kenya, apparel and leather supply chains in Bangladesh and India, and agricultural smallholder farmers in Tanzania.

In India, the tea industry has a vested interest in long-term, sustainable access to water. It requires the right quality and quantity of water for plant growth as well as water for the health and livelihood of its workforce.

With the increasing impacts of climate change and growing populations, this water-intensive sector could threaten essential resources, but by investing in WASH facilities, particularly those that are climate-resilient, the industry can realise its employees' rights, improve health and wellbeing, promote holistic water management across the sector and build business resilience.

Research carried out on two tea estates in Darjeeling, West Bengal, demonstrates the business case for investing in WASH. Over the course of the study, productivity at both sites increased by 27% and medical incidences decreased by 5%. Improved service provision and hygiene training led to a 23% point decrease in open defecation in remote parts of the tea estates. While in the community, 74% of households had a water source close by (less than 50m away) compared to 55% at the start.

The tea estates returned mixed returns on investment – one generating a \$1.20 return for every \$1 invested, the other \$-0.17. Combined they produced a project ROI of \$0.52. Assuming a continued investment in WASH over a 10-year period, the tea estates in India showed an estimated overall ROI of \$3.26 for every \$1 invested (ranging from \$2.44 to \$4.07). The fact that one tea estate generated a negative ROI, is likely related to external factors (including COVID-19) and workplace-specific nuances. However, the qualitative evidence suggests the WASH interventions at the factories had a positive effect on business indicators overall.

Companies must respect the human rights to water and sanitation and should ensure employees have clean water, decent toilets and handwashing facilities in the workplace. *Boosting business: why investing in water, sanitation and hygiene pays off* shows this should not be seen as an expense, but a sound investment with a ripple effect far beyond the bottom line.



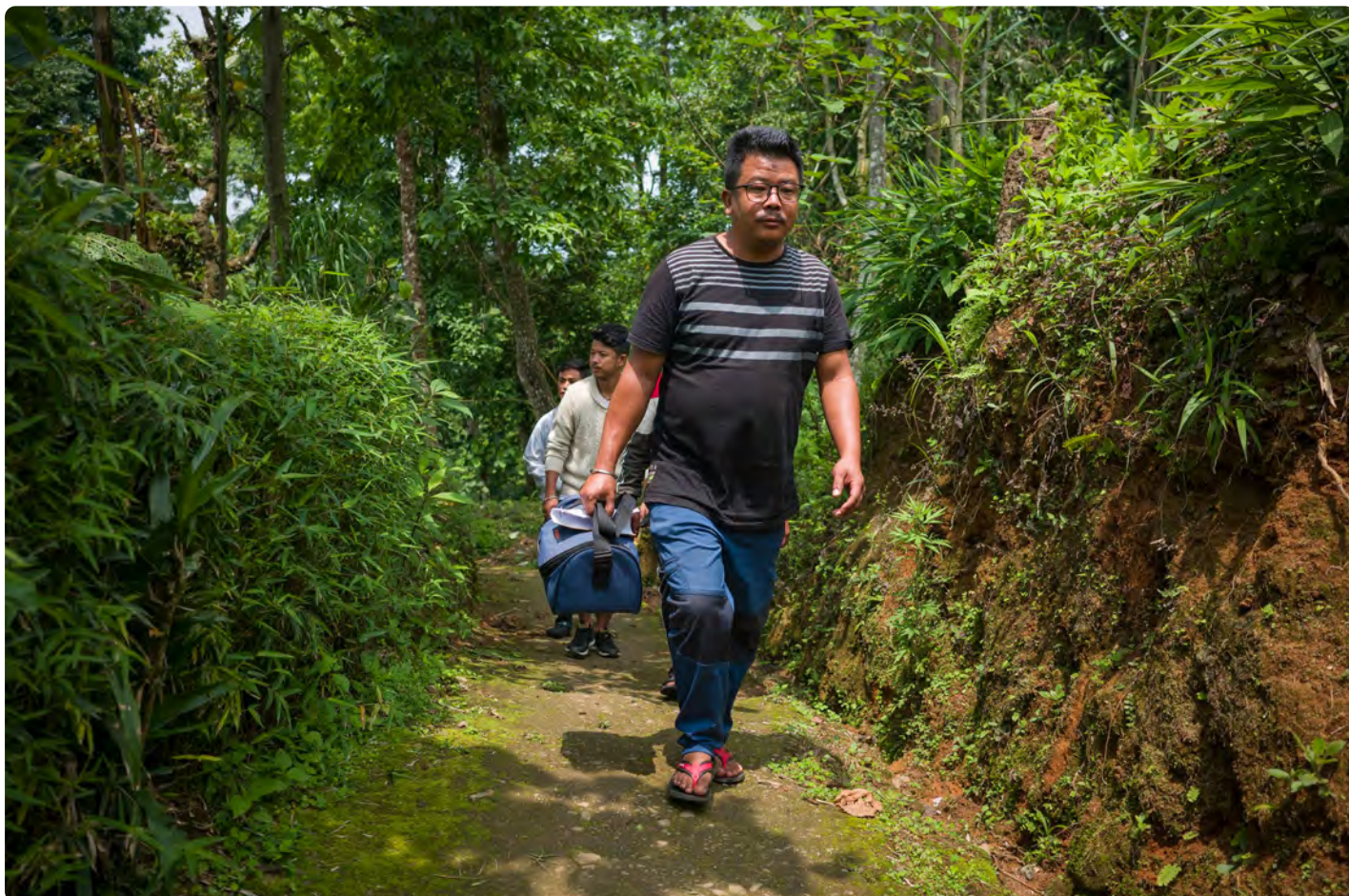
# 1

## Introduction



● Jalu Pradhan was a tea picker for 13 years before she took on the Supervisor role – so she understands the importance of WASH for employees first hand. Nagrifarm tea estate, Darjeeling, India. May 2022.





● The youth group team, led by Imam, on their way to perform a water testing exercise in Darjeeling, India. May 2022.

The role of water, sanitation and hygiene (WASH) in economic development and resilience is relatively well documented,<sup>1</sup> but its impact on workplace performance through employee health and wellbeing is less well evidenced.

*Boosting business: why investing in water, sanitation and hygiene pays off*, aims to build a strong case for action and investment in WASH throughout corporate supply chains and communities.

The research measures the return on investment (ROI) and wider business benefits of expanding these essential services at speed and scale – showing companies, brands and suppliers the positive impact they can have on employees and their communities, at the same time as ensuring business productivity and growth.

**Everyone, everywhere has a human right to water and sanitation – at home, in their community and at work.**

1. Vexler C, Walker O, Mortlock C, et al (2021). *Mission-critical: Invest in water, sanitation and hygiene for a healthy and green economic recovery*. WaterAid and Vivid Economics. UK. Available at: [washmatters.wateraid.org/sites/g/files/jkxooof256/files/mission-critical-invest-in-water-sanitation-and-hygiene-for-a-healthy-and-green-economic-recovery\\_0.pdf](https://washmatters.wateraid.org/sites/g/files/jkxooof256/files/mission-critical-invest-in-water-sanitation-and-hygiene-for-a-healthy-and-green-economic-recovery_0.pdf) (accessed 19 Apr 2022).



● Employees perform the withering process at the factory in Nagrifarm tea estate in Darjeeling, India. May 2022.





# Context

## The sector

In 2020, 1,325,000 tonnes of tea was exported worldwide, with India being the second largest exporter after China.<sup>2</sup> A large proportion of the world's tea is grown on vast commercial plantations. In India, there are more than 1,500 tea estates covering approximately 637,000 hectares of land. Smallholder farmers also play a significant role – producing 40% of the country's total tea output.

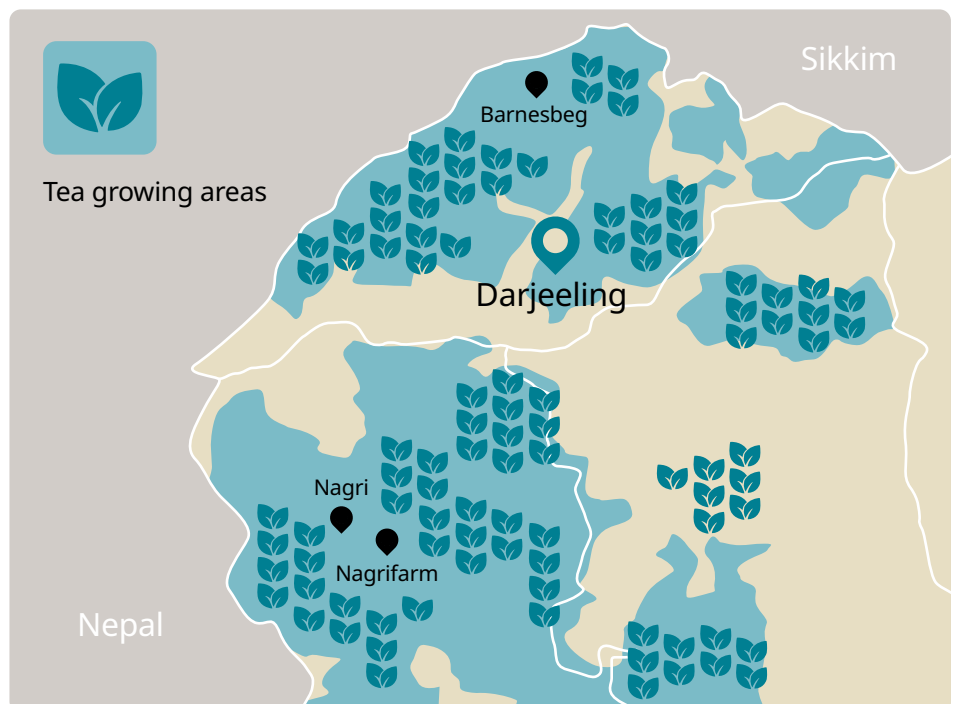
India's tea industry employs more than 1.2 million people and 40% of those are women.<sup>3</sup> In Darjeeling, up to 40% of the total resident population works on tea estates. 'Pluckers' have a physically demanding job – they pick leaves, fertilise, weed and prune the plants, and are responsible for maintaining the grounds.

Most estates also operate their own tea factory on site, where green leaves are processed to make tea for consumption.

Water stress is a concern across the sector and for many households. Unpredictable droughts are already affecting the yield and quality of the tea.<sup>4</sup>

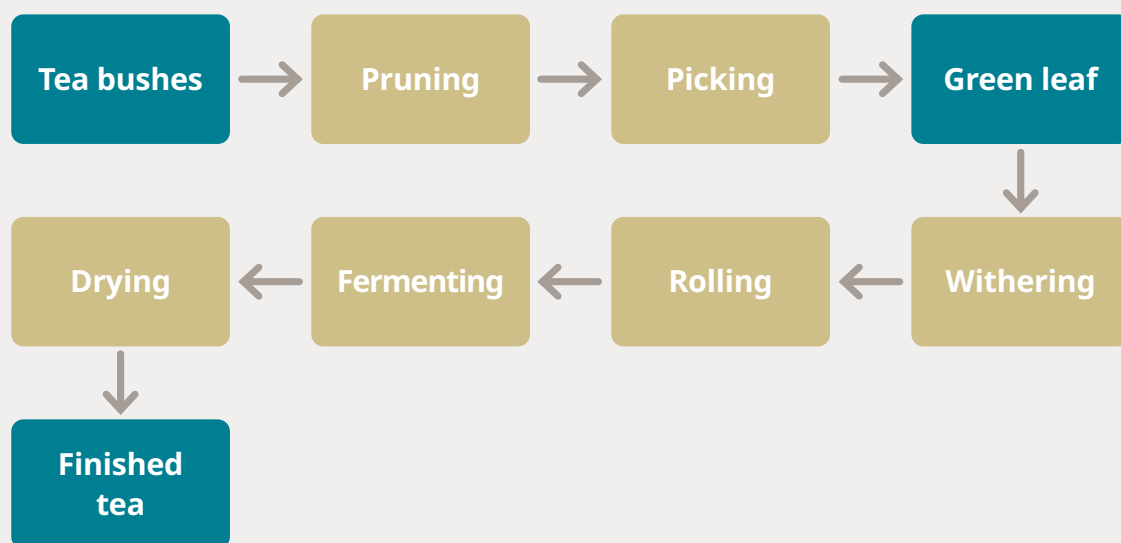
The lack of socio-economic opportunities within the sector is having an impact on the health of people living on the tea estates, with women being disproportionately affected by the nature of the work and poor WASH services.

**Figure 1: Location of the tea estates**



2. International Labour Organization (2020). *Wages and working conditions in the tea sector: The case of India, Indonesia and Viet Nam*. p1. Available at: [ilo.org/wcmsp5/groups/public/-/ed\\_protect/-/protrav/-/travail/documents/projectdocumentation/wcms\\_765135.pdf](https://ilo.org/wcmsp5/groups/public/-/ed_protect/-/protrav/-/travail/documents/projectdocumentation/wcms_765135.pdf) (accessed 30 May 2022).
3. Tea Board India (2020). *66th Annual Report 2019-2020*. Available at: [teaboard.gov.in/pdf/ANNUAL\\_REPORT\\_FINAL\\_2019\\_2020.pdf](https://teaboard.gov.in/pdf/ANNUAL_REPORT_FINAL_2019_2020.pdf) (accessed 30 May 2022).
4. Das AC, Noguchi R, Ahamed T (2021). *An assessment of drought stress in tea estates using optical and thermal remote sensing*. Available at: [mdpi.com/2072-4292/13/14/2730/pdf](https://mdpi.com/2072-4292/13/14/2730/pdf) (accessed 30 May 2022).

**Figure 2: The tea supply chain**



## The workplaces

The Barnesbeg tea estate near Bijanbari block, northwest Darjeeling and the Nagrifarm tea estate in the Rungbong valley, southwest Darjeeling were selected for this project. There are 1,417 tea pickers across both sites, with 654 at Barnesbeg and 763 at Nagrifarm.

The employees predominantly live in the villages within the estates. The Barnesbeg tea estate covers 288 hectares (130 hectares for tea cultivation) and accommodates five villages, which are home to 243 households and 1,489 people.

The Nagrifarm tea estate is considerably larger, spanning more than 571 hectares and accommodating 15 villages, 906 households and 4,190 people.

The rights of employees are the same across the two estates, and free ambulance services, and maternity care is provided to all employees – aligned with the Rainforest Alliance guidelines. There are slight nuances to the terms of conditions for temporary/casual employees based upon the period of engagement with the tea estate. Barnesbeg tea estate is a Rainforest

Alliance certified estate and both Nagrifarm and Barnesbeg tea estates are certified organic.

The two estates in Darjeeling supply to separate companies, Barnesbeg tea estate supplies to Goodricke Company and Nagrifarm tea estate supplies to Chamong Company. The supplier companies will then often work with global sourcing companies further along the chain.

■ A plantation employee queues up to get their harvest weighed at the Nagrifarm tea estate in Pohkaribong, Darjeeling, India. May 2022.





## WASH baseline

At the start of the project, baseline studies showed the level of WASH services and behaviours at the two tea estates was poor. In the picking areas there were no drinking water points. Toilets were available in some areas, but improvements were needed to make them more accessible and functional. In some remote areas, open defecation was reported. WASH provision was slightly improved at the community and household level but overall, the lack of water and sanitation infrastructure and poor hygiene behaviours made employees' working conditions and living standards challenging.

● Jalu Pradhan, Supervisor, now offers advice to women on how to manage their menstruation. Nagrifarm tea estate, Darjeeling, India. May 2022.



**Table 1: Overview of WASH baseline conditions, aligned with JMP service levels<sup>i</sup>**

Workplaces – picking area	Community/household level
<b>Water</b> <ul style="list-style-type: none"> <li>● No drinking water points</li> </ul>	<b>Water</b> <ul style="list-style-type: none"> <li>● 19% of households depend on unimproved sources for drinking water</li> <li>● 55% of households have limited to basic drinking water services – walking more than 15 minutes to collect water (less than 50m away)</li> <li>● 70% of households use rainwater harvesting (RWH), but 20% have below 100L storage capacity</li> </ul>
<b>Sanitation</b> <ul style="list-style-type: none"> <li>● Access to limited toilets in some areas of the picking area but improvement in access and functionality required</li> </ul>	<b>Sanitation</b> <ul style="list-style-type: none"> <li>● 94% of households have a limited sanitation service, with use of an improved toilet</li> </ul>
<b>Hygiene</b> <ul style="list-style-type: none"> <li>● Poor hygiene knowledge and limited handwashing (19% of employees never wash their hands at work)</li> <li>● Poor menstrual health and hygiene (MHH) knowledge and practice</li> </ul>	<b>Hygiene</b> <ul style="list-style-type: none"> <li>● Poor hygiene knowledge and limited handwashing</li> <li>● Poor MHH knowledge and practice</li> </ul>

i. The WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP) reports on country, regional and global estimates of progress on WASH. The JMP service ladders are used to benchmark and compare service levels across countries. See: [washdata.org/monitoring](https://washdata.org/monitoring)



# 2

## Methodology

● A women's group was formed to produce re-usable sanitary pads to help make a living. Darjeeling, India. May 2022.





## Objectives

- Improve WASH services and hygiene behaviours for tea estate employees at work and in the communities where they live.
- Build a business case for WASH investment on tea estates and in employee communities, by calculating the return on investment and broader benefit from business indicators.
- Influence the tea industry more broadly by building the evidence base for providing people with a safe and hygienic work environment.

## Indicators

The following indicators were used to measure the impact of the intervention:

- WASH improvements, and the effects of these on employees' health and wellbeing.
- The financial value to the tea estates, by calculating the ROI based upon quantitative business benefits.
- Quantitative and qualitative business benefits focused on absenteeism, attrition, medical costs, punctuality, quality, tax saved, productivity, job satisfaction, morale and rainwater harvesting. Benefits to employees and family members focused on health, time saved and personal income.

Longitudinal data was collected from a random sample of 266 tea pickers at the start and 239 at the end of the project (51% Barnesbeg and 49% Nagrifarm), with a 95% confidence interval and 5% margin of error. For the employee survey, 40% attrition and 10% non-response was accounted for, so there was no need to take an additional sample at the endline. The ratio of women to men participating was almost the same in both baseline and endline surveys – 81% to 82% women to 18% to 19% men. Simple analysis was conducted comparing the same indicator in both baseline and endline.

Secondary data was collected from the management to measure the business indicators including illness among employees, absenteeism, productivity, attrition, error rates, employee costs to company, training costs and profit per unit. Data was collected through the baseline survey carried out in January and February 2020, for the previous year, and an endline survey was conducted in September and October 2021, covering the year from July 2020 – July 2021.

Monthly management data from the two tea estates was collected from January 2019 to August 2021, enabling us to gather data to calculate the ROI and assess business benefits and trends. For additional detail and specific information on the methodology, particularly on the detailed ROI calculations, please refer to the *Technical note*.<sup>ii</sup>

## Measuring impact on employees' health and wellbeing

The project used a before and after comparisons with a baseline and endline study to show the impact of the WASH intervention on the tea estate employees and their households. Data was collected from tea pickers through a quantitative survey and qualitative focus group discussions. Key informant interviews were also conducted with supervisors and management, and structured observations were carried out key locations like waterpoints and handwashing stations to determine the knowledge, attitudes and practices (KAP) of employees at work and home.

**Table 2: Data collection timeline**

Study period	Timeline
Baseline	January – February 2020
Project period	January 2020 – August 2021 (20 months)
Endline	September – October 2021

ii. For a more detailed methodology, see: [wateraid.org/boosting-business](https://wateraid.org/boosting-business).



## Measuring financial value to the businesses

To understand and measure the ROI and business benefits derived from improving WASH in the workplace and employees' communities, we defined an outcome and impact pathway for the project. Please start reading the diagram from stage '1. Investment/inputs'. This pathway lists all indicators studied as part of this project. The indicators in white were tracked and either qualitative or quantitative data was gathered to help build the picture of benefits and impact for people and the business. The indicators in black were not tracked for this project.

### Outcome and impact pathway

#### Outcomes

##### Workspace level

Employees have:

- Access to improved WASH facilities
- Improved knowledge of hygiene
- Improved practice of hygiene

##### Community level

Employees and family have:

- Access to improved WASH facilities
- Improved knowledge of hygiene
- Improved practice of hygiene

#### Outputs

##### Community level

Capital:

- Rainwater harvesting system
- Drinking water units
- Handwashing points
- Sanitary protection of springs and spring-shed development
- Sanitary waste disposal units
- Liquid waste management system

Training:

- Hygiene behaviour promotion and training (sanitation, MHH, hand hygiene, food hygiene)
- Training on water quality testing, monitoring and surveillance
- Training on operation and maintenance (O&M) of WASH infrastructure
- Specific hygiene session and training of teachers, Samaj on COVID-19

##### Household level

Capital:

- Installation/renovation of WASH facilities (overhead tanks, toilets, handwashing stations, etc.)
- Liquid waste management system
- RWH system
- Pipe water supply connection (for drinking water)

Training:

- Orientation on O&M of WASH facilities
- Hygiene behaviour promotion and training (sanitation, MHH, hand hygiene)
- Specific hygiene sessions on COVID-19 protection and prevention



#### Impacts

##### Benefit to people

- Improved health of employees and family members
- Increased job satisfaction
- Improved safety and dignity
- Time saved
- Decreased personal medical costs
- Improved personal income

##### Benefit to supplier

Quantitative:

- Improved productivity
- Improved quality
- Decreased medical incidences
- Decreased absenteeism
- Decreased attrition
- Improved punctuality
- Decreased operational cost of water

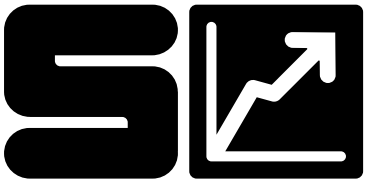
Qualitative:

- Better reputation



#### Investment/inputs

- Capital cost
- Operations and maintenance cost
- Training cost
- Opportunity cost



#### ROI\*

##### Nagrifarm:

- Project ROI
- Projected ROI

##### Barnesbeg:

- Project ROI

#### Overall project ROI and projected ROI

\* The ROI is calculated by comparing baseline and endline data for the project period and is called the 'Project ROI'. However, the outcomes are often not visible in the short timeframe of the programme. To understand how the programme affects in the long-term, the ROI is projected for a period of 10 years and is called 'Projected ROI'. We take an average of factory level ROIs to calculate the overall ROI.

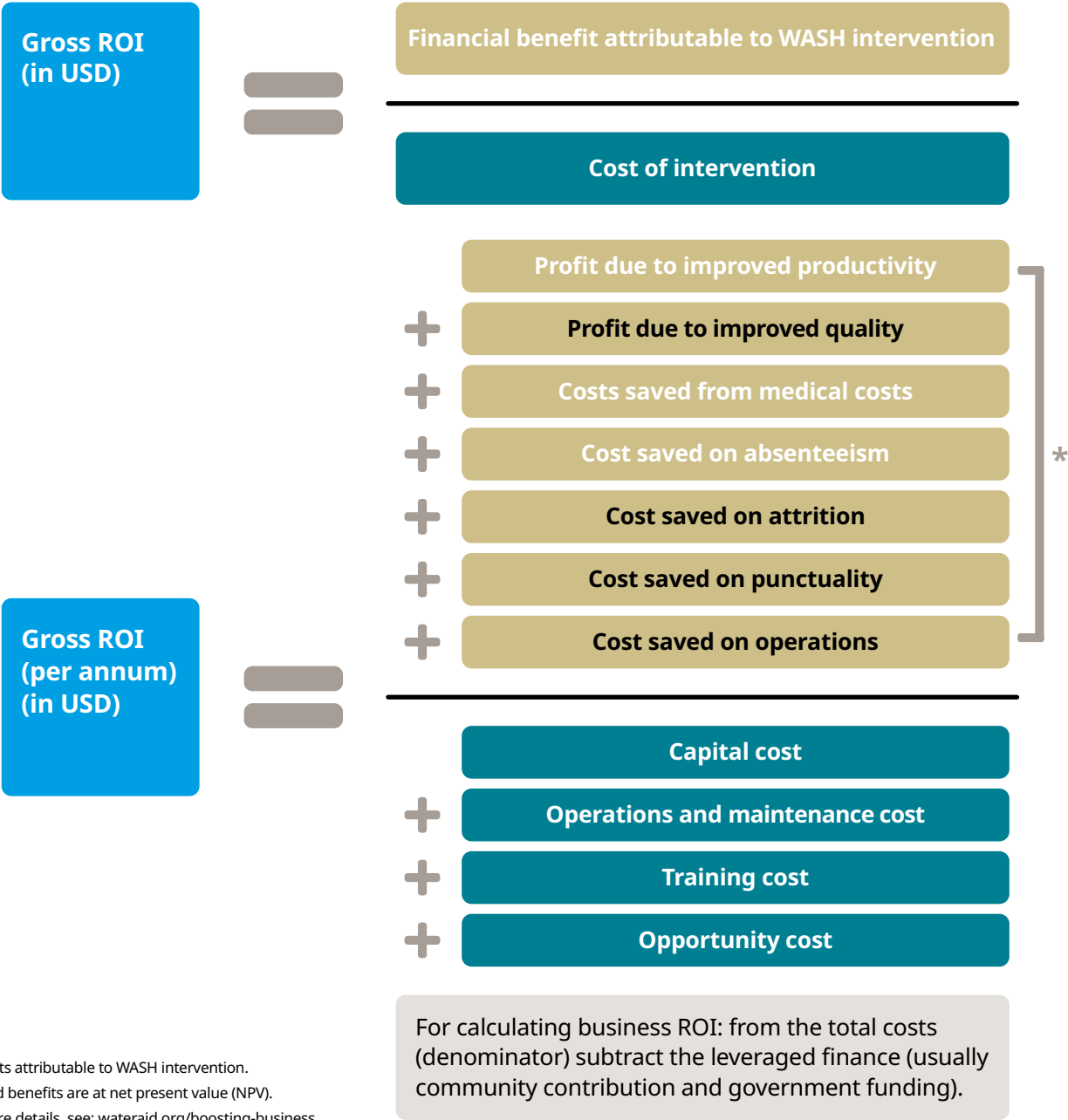


# ROI formula<sup>iii</sup>

The ROI aims to calculate the expected financial benefit of WASH. Given the nature of the interventions, not all benefits can be attributed to this. Therefore, the results were assessed alongside evidence from interviews and literature, as well as knowledge based on the context, to ascertain how much could be attributed to WASH. We also undertook sensitivity analysis to understand the effect of attribution percentages on the ROI. Please see the *Technical note*<sup>iv</sup> for more detail.

The ROI was projected over 10 years, assuming the businesses continue to invest in maintaining the WASH infrastructure and behaviour change interventions. Some costs will also continue in the projected period. For calculating projected ROI, net present value and drop-off rates have been taken into account. For the ROI calculation, the qualitative elements of the 'Benefits to supplier' were not included.

The graphic below indicates the high-level ROI formula and a more generic ROI detailed breakdown of that same formula, highlighting the indicators used for ROI calculations in white, and those not used in black.





## Research limitations (including impact of COVID-19)

This pilot research faced several challenges and limitations, not least of all, the spread of COVID-19. During the first wave of the pandemic, the tea estates used minimum staff on rotation and movement across the sites was restricted. The initial months of the pandemic coincided with the highly profitable Darjeeling first flush, the first picking of the harvest season, but since no work was allowed, the estates faced losses as the leaves could not be picked on time. This effected business productivity as well as data collection and the natural flux in workforce migration was accentuated.

WASH implementation was also affected by political instability in Darjeeling (currently in West Bengal, India) due to the area coming under Gorkhaland Territorial Administration (GTA) which wants it to become a separate state within India. This led to disturbances and riots which limited movement across the tea estates for a few days.

Establishing trust and building a good working relationship with the management of the tea estates was an important foundation for the success of the project. Managers were initially cautious having had bad experiences working with a different team of researchers in the past, so building trust and rapport took time. Overall, this may have affected the detail and accuracy in the data provided. To mitigate any potential issues and ensure a positive and trusting working relationship with the tea estate management, nothing was shared on social media or made public before the project was over and not without consent from the management (a confidentiality agreement was also put in place).

The study was not designed to measure causal impacts, so we were unable to establish causality with precision. However, using our knowledge and understanding we had drawn causality based on interviews with the workforce and managers and relevant literature. Changes in people's handwashing habits and attitudes cannot be exclusively linked to the project, as widespread hygiene campaigns in response to COVID-19 also had an impact – however attribution was considered, and results can be deemed important. Rather than accounting all changes to the WASH intervention, we have estimated an attribution of percentages and tried to pinpoint the proportion of change that could have occurred due to WASH.

For Barnesbeg, the attribution percentages used were 10% each for absenteeism and medical costs, and 25% for productivity. For Nagrifarm, the attribution percentages used were 10% for absenteeism and 25% each for productivity and medical costs.

**Please refer to the *Technical note*<sup>v</sup> for how many of these issues have been mitigated and managed.**

● In 2020, WaterAid and Twinings, connected six rainwater storage tanks to the school toilets, so students no longer had to collect water using buckets. Darjeeling, India. May 2022.



v. For a more details, see: [wateraid.org/boosting-business](https://wateraid.org/boosting-business)





# Implementation



● Plantation employees queue up as they wait to get their harvest weighed at the Nagrifarm tea estate in Darjeeling, India. May 2022.



The project was implemented and several WASH interventions were carried out in the Barnesbeg and Nagrifarm tea estates in Darjeeling from January 2020 to August 2021. **72%** of the tea pickers from the endline sample received WASH benefits. Most interventions were made in the communities or households of tea estate employees rather than in the picking areas. Hygiene education and training was also a major intervention across the tea estates, but improved access to water was prioritised.

The WASH intervention was not carried out in isolation and all possible steps were taken to involve sector players, despite external challenges like COVID-19. At the beginning of the intervention, we held a multi-stakeholder consultation and initiated a dialogue on the intervention. Throughout the process, having strong engagement with the Bijanbari and Sukia Pokhari administrations enabled us to mobilise resources to improve the drinking water and sanitation services across both tea estates.

**Table 3: The number of people reached through each intervention**

WASH gap identified	Intervention	People reached*
Limited/no access to adequate-quality drinking water	Restoration and new installation of piped water supply systems	<b>1,690 (1,489 at Barnesbeg and 201 at Nagrifarm)</b>
	Spring protection – three (one at Barnesbeg and two at Nagrifarm)	<b>278 (77 at Barnesbeg and 201 at Nagrifarm)</b>
	Spring-shed development – three (two at Barnesbeg and one at Nagrifarm)	Spring from which <b>1,690</b> people get water
No water quality surveillance or treatment mechanism	Water quality training and capacity building of young people on testing	<b>44</b> young people (at Barnesbeg and Nagrifarm)
	Regular water quality testing of all sources at both tea estates	All drinking water sources in <b>21</b> villages pre- and post-monsoon
Poor sanitation facilities in households	Improvement of toilets	<b>45 (20 at Barnesbeg and 25 at Nagrifarm)</b> <b>223</b> people
	Promotion of liquid waste management	<b>Seven (three at Barnesbeg and four at Nagrifarm)</b>
No operation and maintenance (O&M) system for WASH infrastructure	Training young people on O&M of WASH infrastructure	<b>43</b> young people ( <b>13</b> at Barnesbeg and <b>30</b> at Nagrifarm) <b>Three (one</b> training session at Barnesbeg and <b>two</b> at Nagrifarm)

\*Note: The numbers of people reached should not be added together to make a total as some were reached with more than one intervention.



**Table 3: The number of people reached through each intervention (continued)**

WASH gap identified	Intervention	People reached*
Poor hygiene knowledge and practice of menstrual health and hygiene (MHH)	Regular hygiene sessions	<b>2,403</b> people from <b>21</b> communities ( <b>11</b> units at Barnesbeg and <b>18</b> at Nagrifarm)
	Peer-educator development on MHH – series of training sessions	<b>50</b> peer educators
	Hygiene awareness, MHH, COVID-19 and safe water handling and testing materials developed and disseminated	Young people from <b>21</b> villages
	MHH training for adolescents Eight (three training sessions at Barnesbeg and five at Nagrifarm)	<b>117</b> people ( <b>49</b> at Barnesbeg and <b>68</b> at Nagrifarm)
	Celebration of World Water Day, World Toilet Day and Menstrual Hygiene Day to raise awareness at both tea estates	<b>167</b> people, especially schoolchildren
	Training Samaj (community level institution) members on WASH	<b>21</b> Samaj ( <b>five</b> units at Barnesbeg and <b>16</b> units at Nagrifarm), consisting of around <b>1,760</b> people
Poor school WASH facilities	Improvement of WASH infrastructure in four schools (toilets, handwashing facilities, water facilities)	<b>514</b> children <b>Five</b> ( <b>one</b> school at Barnesbeg and <b>four</b> at Nagrifarm)
	Formation of child cabinet and capacity building on hygiene education	<b>404</b> children and parents <b>Six</b> schools across both estates
	Hygiene promotional materials developed (wall painting on handwashing and MHH)	<b>514</b> children <b>Four</b> ( <b>one</b> school at Barnesbeg and <b>three</b> at Nagrifarm)
	Teachers trained on school WASH	<b>48</b> ( <b>15</b> at Barnesbeg and <b>33</b> at Nagrifarm) <b>Three</b> ( <b>one</b> unit at Barnesbeg and <b>two</b> at Nagrifarm)





● An aerial view of tea pickers at work in the plantation on the Nagrifarm tea estate. Darjeeling, India. May 2022.



# 4

## WASH outcomes



● The tea picking process at the Nagrifarm tea estate in Darjeeling, India. May 2022.




## WASH improvements

The terrain on the tea estates presented challenges for the design, control and subsequent management of WASH facilities, so for this project, intervention was focused on tea pickers' communities and households rather than their place of work.

On the tea estates hygiene awareness training and capacity building were prioritised, which had a positive effect on hygiene behaviours.

**23% POINT**   
decrease in open defecation rates in remote areas across the tea estates.

At the beginning of the study, 60% of employees defecated outside, but this was reduced to **37%** at the end. Data on open defecation was derived from reported and observed behaviours. The improvement was attributed to improved sanitation facilities but hygiene behaviour training and peer educators played a key role in changing the sanitation behaviours of employees.

**100%**   
of households now have safe water from an improved source for drinking, up from 81% at the start of the project.

The reliability of access to safe water throughout the year increased from 56% to **61%**. The time taken to collect water also decreased, enabling tea pickers and their families to spend time on other activities or work more productively on the tea estate.

**74%**   
of households now have access to a water source within 50m, compared with 55% at the start of the study.

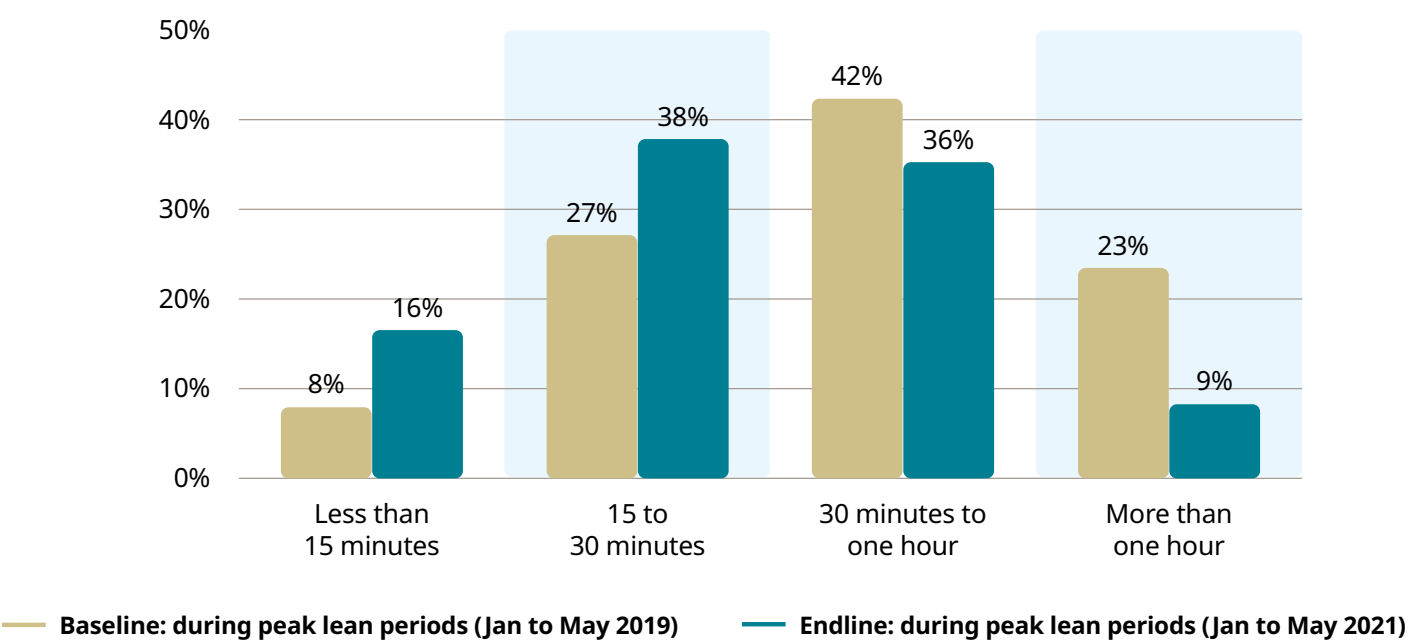
Access to water improved across the community, with the number of people relying on a water source between 50–150m away decreasing from 34% to **23%**, and those travelling further reduced from 11% to just **2%**.

Even during periods of water scarcity (January to May) and with the impacts of a changing climate, time spent collecting water was reduced. At the start of the study, 65% of people spent between 30 minutes to an hour for a round-trip water collection, which dropped to **45%** after intervention.



Many saw their journey times cut to between 15 and 30 minutes (with **38%** reporting this duration up from just 27% at the start), while others benefitted from a trip of less than 15 minutes to collect water (**16%**, up from 8% at the beginning of the study period (see Figure 3)). The cut in journey times shows an improvement in the availability of the right quality and quantity of water for tea pickers and their families.

**Figure 3: Time spent on one water collection in water-scarce periods**



### Community benefits

25%

POINT

reduction in households with unsafe water handling practices (drawing water using a vessel with a handle is deemed more hygienic).

At the start, 60% of households had unsafe water handling practices and did not use a vessel with a handle to draw water, but was reduced to **35%** by the end of the study. Water storage, water handling and treatment of water at household level all improved following the hygiene training. The capacity to store adequate volumes of harvested rainwater increased at

household level by 15% and water quality levels and testing in the community improved as well.

Of the existing toilets, **100%** now have safe faecal sludge management (FSM) technology, compared with 94% at baseline. The accessibility of toilets for people with disabilities improved by **15% points** – from 57% at baseline compared to **72%** at endline.

Access to WASH facilities and behaviours around handwashing after using the toilet improved. At the start of the study, only 5% of people reported access to any kind of handwashing facility at work, but this increased to **23%** at the end. There was a **12% point** increase in the tea pickers reporting that they had washed their hands after their last defecation (**97%** up from 85%).

All these results show a positive trend in the provision of WASH following the project across the tea estates, particularly at household level.



## Case study – Health worker

Kesang Lama, 32, is a Health worker in Daralong village near the Barnesbeg tea estate. As part of the initiative from Twinings and WaterAid, she has been working to help normalise and improve menstrual health and hygiene within the community. **“As a peer educator, my job is to inform girls and women about sustainable sanitary products and safe menstrual hygiene practices,”** she says.

Basant Lama, Kesang’s mother, remembers how difficult it used to be for women and girls in the community. **“The silence used to be the hardest part of menstruation,”** she says. **“Women used to use cloth but were not allowed to wash it at the main water source.”** Instead, they would go to a designated spot, a spring about half an hour away, to wash their pads. Basant recalls the indignity and inconvenience of that daily walk down the steep slope while suffering the discomfort of a period.

**“We used to walk about half an hour away to collect two buckets of water,”** she recounts. **“Skin diseases used to be very prevalent because people didn’t bathe as often as they should have, neither did they wash their clothes.”**

Kesang says that the recent menstrual health awareness workshops have improved Barnesbeg’s public health outlook. **“I tell girls why cloth pads are better for the environment and how to use them hygienically,”** she says.



● Kesang Lama, 32, is Health worker and is currently studying at college in Darjeeling, India. November 2021.

**“Those who work in the tea gardens find it more convenient to use conventional pads during the day but all of them use cloth at home now.”** This, along with the improvements to Barnesbeg’s main spring, has helped to ensure that girls can wash their pads in the comfort of their own homes, without having to walk long distances.

Better access to water has also brought down the incidence of diseases. Basant says that life today is much better than it was when she was younger. **“It will only get better as more women shrug off their shyness and speak up about their problems,”** she says. Kesang agrees. **“When I look around me, I see girls feeling freer than they used to feel before,”** she says. **“Things are changing around here and that’s a good thing.”**



# 5

## Return on investment



● Jeevan Jyoti Guha, Senior Assistant Manager, says that easier access to water has helped increase the punctuality and productivity of employees at the Nagrifarm tea estate. Darjeeling, India. May 2022.



Overall, the project returned a positive ROI across the two tea estates for the period of the project with **\$0.52 return for every \$1 invested in WASH** (ranging from \$-0.17 for Nagrifarm to \$1.20 for Barnesbeg).

The overall 10-year projected ROI for the two tea estates, assuming continued investment in WASH services and behaviours, was **\$3.26 for every \$1 invested in WASH** (ranging from \$2.44 in Nagrifarm to \$4.07 in Barnesbeg).

The cumulative projected business benefits 10 years after the end of the project for the two tea estates is estimated at **\$506,000**.

Barnesbeg showed a positive return on investment (ROI), whilst Nagrifarm showed a slightly negative ROI. However, the overall ROI across the two tea estates within the project period was positive.

Although there was a range in ROI results, the study provided evidence that given the right tea estate context, WASH can bring financial benefits in the tea sector. The pilot research also generated some valuable insights on design principles for a WASH project with an ROI objective.

Overall, the project ROI for both tea estates returned a positive ROI with **\$0.52 return for every \$1 invested in WASH** (ranging from **\$-0.17** for Nagrifarm to **\$1.20** for Barnesbeg). The range in ROI results between the two estates can be explained by two main reasons: high Capital Expenditure (CapEx) for Nagrifarm and lower productivity at Nagrifarm.

Both tea estates are large, however Nagrifarm is larger and that coupled with difficult terrain across the estate required larger CapEx per WASH intervention leading to a lower ROI.

Productivity was the most influential indicator contributing to ROI, and in the first year of intervention, COVID-19 had an impact on productivity at Nagrifarm. Barnesbeg generated a positive and higher ROI in comparison due to higher benefits as compared to the cost of the project.

Projecting forward over 10 years after intervention, the overall ROI across the two estates increases with a **\$3.26** return for every \$1 invested.

There are two reasons why it is useful to look at the projected ROI:

1. The assessment at the end of the project period happened after a very short time, whereas the full extent of the impact will take longer to be revealed.
2. A lot of capital cost has been spent in the project period, which is expected to show benefits for many years after the project period has ended. To account for these continued benefits, it is important to look at a period roughly aligned to the expected lifespan of the capital infrastructure.

**Table 4: ROI and payback period per tea estate**

Indicator	Result (\$)	
	Nagrifarm	Barnesbeg
Project ROI	-0.17	1.20
Projected ROI (10 years)	2.44	4.07
Payback period begins	Year 5	Year 2



The ROI assessment includes all costs, including the money leveraged from the Government, along with monetary contributions from the project. A business ROI can also be generated, and we would theoretically expect this to be higher. The business ROI often requires leverage of other financial contributions but this can contribute to broader benefits as well as the longer term sustainability of the project.

The potential to raise finance offers even greater ROI to incentivise stakeholder collaboration. In this project, the tea estates are expected to make the entire investment if carrying out a similar project in future. Therefore, project ROI and business ROI are the same.

## Payback from the first year of the project

On average, the payback period for the two tea estates starts 3.5 years after the start of the project (from two years for Barnesbeg to five years for Nagrifarm).



Employees pick tea at the Nagrifarm tea estate in Darjeeling, India. May 2022.

## Analysis of business benefits

### Medical incidences, absenteeism and productivity

Across the two tea estates (Nagrifarm and Barnesbeg), the results on business benefits were combined and some overall trends were identified. The pilot projects identified that there were only three business indicators that had an impact on ROI, these were: productivity, absenteeism, and medical costs.

There were other interconnected business indicators but these were less influential and benefit could be outweighed by potential CapEx costs, ultimately resulting in a negative ROI.

It is possible for a tea estate to show bigger gains overall but fall behind on one indicator, or conversely show large gains on one indicator but that benefit could be outweighed by potential CapEx costs, ultimately resulting in a negative ROI.



↓ Medical incidences attributed to WASH decreased by **5%**



↓ Absenteeism attributed to WASH decreased by **1%**



↑ Productivity attributed to WASH increased by **27%**

## Medical incidences

Overall, across both Barnesbeg and Nagrifarm tea estates, intervention led to a **5%** decrease in the number of patients reporting WASH-related medical conditions.

Secondary data from medical clinics on the tea estates showed a drop in the number of patients attending clinics with conditions like diarrhoea, dysentery, waterborne diseases and urinary tract infections. The data showed these WASH-related diseases are most common at the start of the year from February and March and peak during April to June.

Through attribution and interpretation interviews with key stakeholders across the tea estates, the following rationale was identified for a decrease in medical incidences:

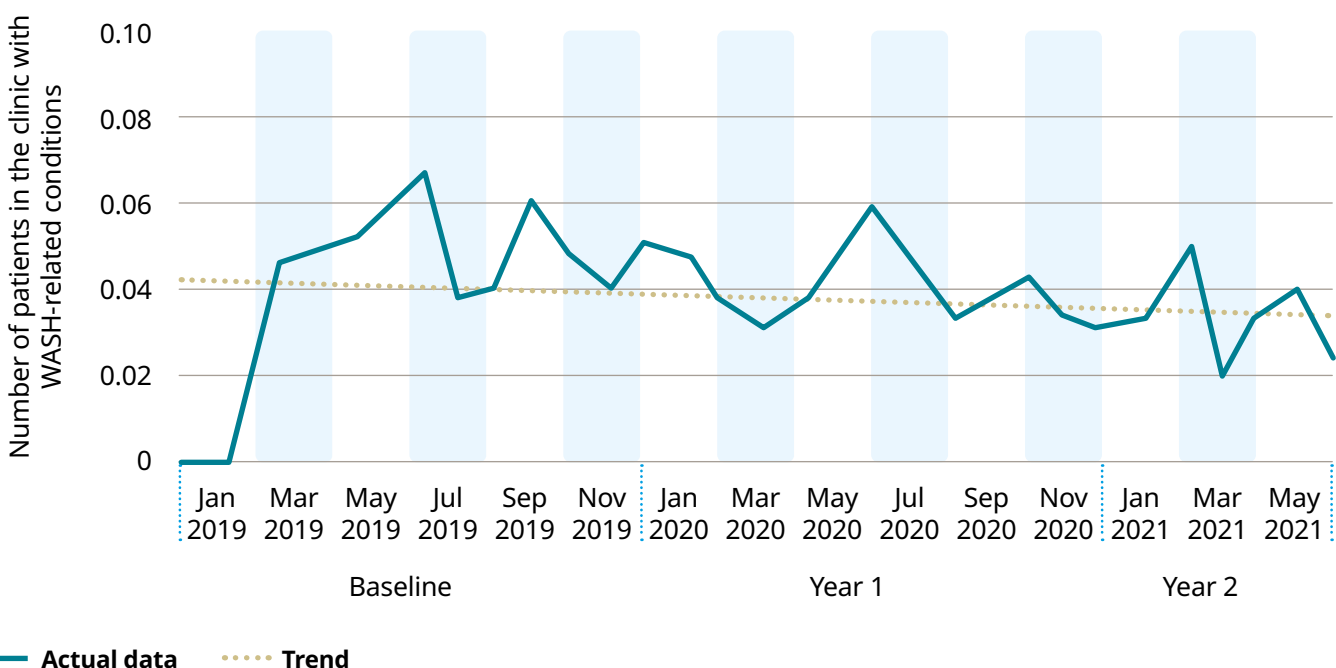
- Increase in hygiene behaviour training led to increased awareness and understanding, health, hygiene and disease prevention among tea pickers.
- Employees started taking care of their own health and that of their families, so medical incidences and costs decreased.

- Collective NGO impact has led to broader influence across the tea estates. As well as WaterAid's project, the local NGO, DLR Prerna, also collaborated with local female health activists (ASHA) in the past and provided them with health training. The WaterAid project has reinforced this important hygiene behaviour training messaging for broader scale and impact.
- Increased handwashing combined with COVID-19 health messaging and WaterAid's intervention, led to people taking more precautionary measures like washing their hands more frequently at work and at home.

**"This intervention, in addition to the heightened awareness about personal hygiene during the COVID-19 pandemic, has resulted in fewer people falling ill and reporting sick to work."**

Bhanu Khawas, Health worker, Nagrifarm tea estate

**Figure 4: Number of patients in the clinic with WASH-related conditions, per employee (Nagrifarm)**





## Absenteeism

Overall, across the tea estates, absenteeism attributed to WASH decreased by **1%**. It is difficult to analyse the impact of the WASH intervention and its correlation with reduced absenteeism because across the two estates each employee is entitled to 14 days of leave, whether they are sick or not. Whilst absenteeism of employees hasn't decreased that much, analysis suggests it is highly likely that the WASH interventions have decreased WASH-related sickness, as confirmed by decreasing trend in medical incidences.

Qualitative evidence also supports the reduction in the number of employees and their families falling sick. At Barnesbeg tea estate, interviews with management attribute this change to the intervention but also the impact of the COVID-19 pandemic, which has encouraged employees to practice good hygiene and protect themselves and their families.

## Productivity

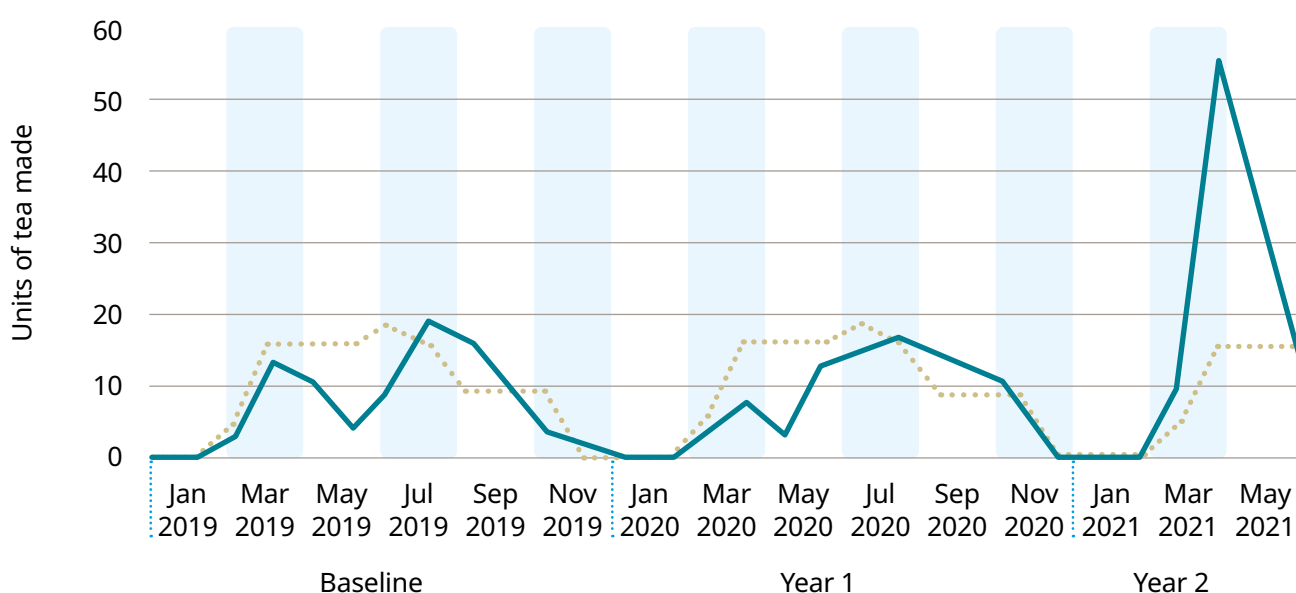
Overall, across both tea estates, there was an increase in productivity of **27%** (ranging from **2%** for Nagrifarm to **52%** for Barnesbeg, against initial targets (see Figure 5)). These figures are all attributed to WASH interventions from the project which has been verified based upon interviews and discussion with key stakeholders on the tea estate. The tea estate management believe that productivity was influenced by good climatic conditions but that the tea pickers and factory employees had improved health as a result of the interventions.

The lockdown following COVID-19 pandemic did halt production for a short period, but a mitigation plan was put in place and tea pickers were deployed in two shifts to ensure a complete harvest of the tea.

**“Now, with better awareness and overall improvement in hygiene levels among the tea garden employees, such cases have reduced to just two or three a week.”**

Bhanu Khawas, Health worker, Nagrifarm tea estate

**Figure 5: Target vs achievement of tea made, per employee, at Barnesbeg**



— Achievement per employee    ..... Target per employee

## Punctuality

Quantitative data was not collected on punctuality of tea pickers; therefore this indicator was not included in the ROI calculations. However qualitative evidence from tea estate management was compelling and this business benefit would have inevitably contributed to tea picker productivity.

Management highlighted that before the intervention, employees would often be up to an hour late for work. It was felt that the improvement in punctuality was as a result of the WASH intervention, education and fewer visits to the hospital.

**“Now that the water point is installed here, I no longer have to wake up at 5.30am or 3.30am in winter when water becomes scarce. The time I have gained for some extra rest means I can report to work on time and I am not as tired from all the water gathering as I used to be.”**

Siddarth Rai, Plantation employee, Nagrifarm tea estate

## Employee satisfaction

Qualitative data showed employees were satisfied with the project – especially initiatives in the community. Managers at both estates have also reported improved communication and working relationships with their employees and a positive change in the attitude of the workforce.

## Environmental benefits

WASH interventions across the tea estates delivered other environmental benefits, although data on these broader environmental benefits were not directly gathered. Improvements in toilet facilities and functionality as well as education and training resulted in improvements in faecal waste management with water quality checks reducing the risk of surface water and groundwater contamination.

Solid waste management and disposal across the tea estates also improved following hygiene behaviour training and education.

For other indicators, such as punctuality, quality, tax saved and RWH, data was not available. With regards to attrition, data was not available for one tea estate, and for the other the value was negligible.

**“Work in the garden starts at 7 o'clock in the morning. Initially, when I took over the garden in 2019, employees would only get to work by 8am. Most of the time, between 7am to 8am we used to find the employees on the roads.”**

Mr Chetan Channan, Manager, Barnesbeg tea estate





## Social and sectoral benefits

The installation of reliable drinking water points in employees' communities improved the conditions for many. It also helped build community cohesion and gave a collective sense of responsibility which strengthened social and support networks.

**"...the training has made us more aware of the importance of water and using it more sparingly. People are now informed about the type of toilets built and what causes water contamination... we have taken the learnings and are practising them and keeping the future generations in mind."**

Tea picker, tea estate

**"...employees adapt quickly to new changes and take in the learnings. There have been positive changes in the workforce and the WASH programme will benefit all the staff and their families."**

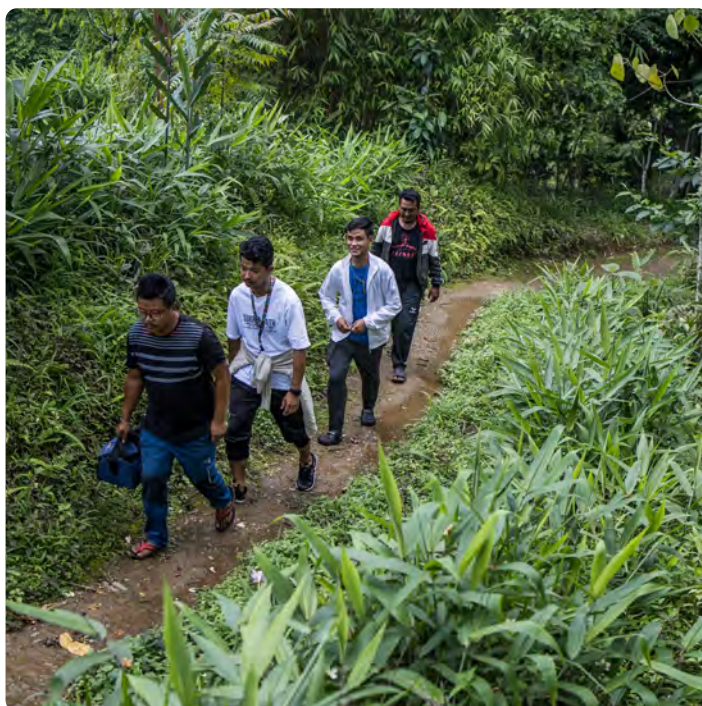
General Manager, Nagrifarm tea estate

Menstrual health and hygiene (MHH) training and education brought together women and girls in the communities. A women's self-help group (SHG) was created, which began producing re-usable sanitary pads for sale.

The intervention also focused on improving the community's knowledge of proper waste disposal. For liquid waste, grey water management systems are now being developed at household and school level.

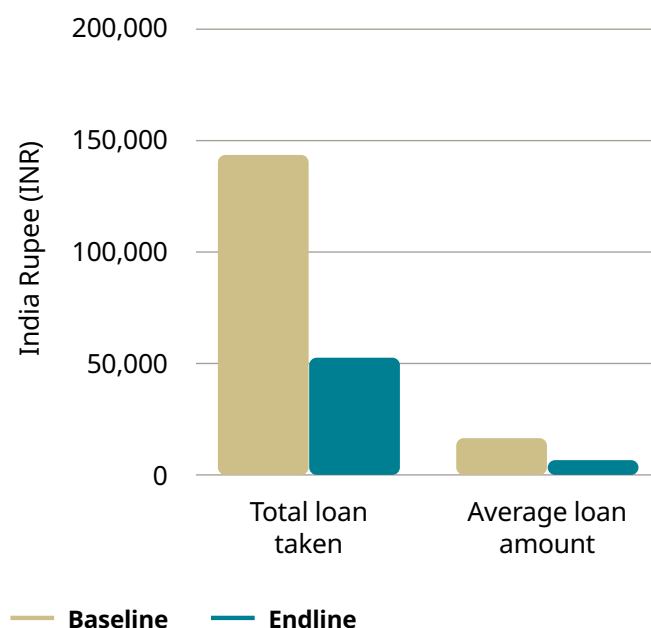
For solid waste, appropriate technologies are being developed at household level to manage faecal sludge as well as black water. Communities are also being advised on the management of solid waste through hygiene sessions.

At the beginning of the project, 71% of people surveyed said they had been forced to take out loans to cover medical and health costs. At the end of the project this had dropped to **57%**.



● A youth group were given kits to test the water quality from the main sources surrounding the tea estate – particularly after monsoons, when the risk of contamination is the highest.  
Darjeeling, India. May 2022.

**Figure 6: Number of loans and loan amount (Indian Rupee, INR) at baseline and endline for both estates**








● Plantation employees queue up as they wait to get their harvest weighed at a weighing station at the Nagrifarm tea estate, Darjeeling, India. May 2022.



A man with glasses and a patterned shirt is leaning over a large metal tray filled with green tea leaves. He is looking down at the leaves, which are spread out in the tray. The background shows a factory setting with metal walls and windows.

● Jeevan Jyoti Guha, Senior Assistant Manager, checks the withering process at the Nagrifarm tea estate factory. Darjeeling, India. May 2022.



## Case study – Tea Estate Manager

Jeevan Jyoti Guha, Senior Assistant Manager at Nagrifarm tea estate, has worked in the tea industry for 31 years and has seen the difference the WaterAid and Twinings initiative has had for the business.

Access to water has always been a real issue for the workforce, especially in summer. **“When the springs which our employees depend on for drinking water dry up, they have to walk longer distances to get water. This causes a delay in reporting to work”** Jeevan said.

Since the construction of eight water storage tanks which supply the community taps, things have got easier. He said, **“Having easier access to water has helped employees save time and this translates into more people reporting for work on time, it benefits the company.”**

The project has also had a positive impact on the health of the tea estate employees. **“Seasonal changes, particularly during monsoons, can cause a lot of cases of diarrhoea, dysentery, vomiting and gastrointestinal issues, which can cause absenteeism.”**

Improving sanitation facilities at employees' homes has had a positive impact. **“As a result, seasonal diseases among the workforce have reduced from 20% to 3%”** he said.

**“I think it is wise to invest in employees' health. A healthier workforce will always benefit a company”.**


● Jeevan Jyoti Guha works inside his office at the Nagrifarm tea estate. Darjeeling, India. May 2022.





# 6

## Learnings and recommendations

A young girl with dark hair tied back, wearing a green V-neck sweater over a white collared shirt and a green and red plaid skirt, stands by a window. She is holding a notebook and looking towards the camera with a slight smile. The window has a wooden frame and a metal latch. The background is slightly blurred, showing a blue wall and a yellow wall.

● Students can now wash their hands at school since the WaterAid and Twinings project installed the rainwater harvesting system. Darjeeling, India. May 2022.



**Capital Expenditure (CapEx) on a project can be daunting and returns might not be immediate, but companies should aim to implement WASH solutions where there is scope to do so, where suppliers are engaged and supportive, and where improvements can be made at work and in employees' communities.**

**Solutions do not always require large Capital Expenditure, with some low-cost solutions providing big results.**

### Design principles

These elements should be considered by the company and implementing partner when trying to execute a successful WASH programme where there is an objective of business return:

- **Take time** to understand the sector and the business, as well as their objectives, commitments and priorities.
- **Solicit** senior level engagement and ensure that suppliers are engaged and supportive of what needs to be implemented.
- **Identify** the 'low-hanging fruit' where there is scope for making improvements in workplace WASH provision and consider the communities where the employees live.
- **WASH** solutions should be context specific and climate resilient – designed for the business and objectives of the project.
- **Consider** effort vs. reward when identifying WASH solutions for the business, large CapEx isn't always required.
- **Consider** potential of reach, scale and replication across the business.
- **Leverage** funding from government or other stakeholders which both offsets the company costs but also enhances the outcomes and results.

### More than a corporate responsibility

Delivering water, sanitation and hygiene is a basic responsibility for any business, offering a ROI and wider benefits of increased productivity, lower medical costs and reduced absenteeism.

For the tea estates, improvements in employees' health increased productivity and cut medical costs. It also reduced the collection time for drinking water, which resulted in less absenteeism.

**Recommendation:** Take a holistic approach when improving WASH at work to achieve the biggest transformational change. Use the financial and other benefits of investing in WASH, as well as the obligation to meet the human rights of employees, to advocate for improvements to WASH facilities at work.

### Consider the context

If the area is not fit for WASH infrastructure, consider alternative design and positioning of facilities. The terrain in Darjeeling poses a challenge, so hardware interventions and appropriate technology are required (e.g., evapo-transpiration-based faecal digesters and biodigester-based faecal digesters). With Darjeeling being a high-precipitation region, it was necessary to develop the timeline of the intervention with the weather in mind. This attention to context increases the potential for success and replicability across Darjeeling and other similar areas.

**Recommendation:** Get a good understanding of the context in which a business operates before choosing WASH technologies and planning the intervention. Consult WASH experts and talk to other businesses in the same area to assess which approaches have worked well in the past and what areas could be problematic. Also explore alternate funding mechanisms to reduce the burden of cost on management.





● Khagendra (left), and his family, now have safe sanitation at home since the installation of a bio digester sewage disposal tank designed to compost all waste. Darjeeling district, West Bengal state, India. November 2021.

## ● Invest in relationships

Building a rapport and engaging with management is the key to a successful WASH implementation. This will help facilitate execution, obtain permission to create facilities, organise meetings and training sessions, and most importantly leverage resources from management.

It's important to consider cultural beliefs and practices to ensure good relationships with stakeholders. Working with respected local community members helps to build trust and community buy-in.

**Recommendation:** Include relationship-building in your strategy and plan when improving WASH in the workplace. Ensure management is aware of the benefits the intervention can bring, and get them on side early. Consider cultural beliefs and practices when building relationships to develop and sustain good relationships.

## ● Include young people

Young people have much to offer in increasing the success of a WASH intervention, acting as advocates for good practices among the family and wider community. For example, on the tea estates, girls were involved with the women's groups, and learnt how to produce re-usable sanitary pads.

**Recommendation:** Consider how to include young people in efforts to improve WASH in the workplace and wider community. Evaluate the potential to involve them in water quality testing, operational maintenance of drinking water facilities, or MHH training.

5. United Nations (2011). *Guiding Principles on Business and Human Rights. Implementing the United Nations "Protect, Respect and Remedy" framework.* Available at: [ohchr.org/sites/default/files/documents/publications/guidingprinciplesbusinesshr\\_en.pdf](https://ohchr.org/sites/default/files/documents/publications/guidingprinciplesbusinesshr_en.pdf) (accessed 12 Aug 2022).



## Call to action

Resilient and prosperous communities, industries and economies are built on strong foundations. WASH is vital to the health and safety of everyone, everywhere, critical to business resilience, supports the ambitions of the Sustainable Development Goals (SDGs), and has the potential to deliver a financial return on investment. It must be considered a core business priority rather than an act of philanthropy or corporate social responsibility.

The tea industry has an important role to play in WASH investment, and in supporting the long-term sustainability of water resources.

By investing in WASH facilities, particularly those that are climate-resilient, the tea industry will realise its employees' rights, improve health and wellbeing, and promote holistic water management across the sector.

Through business, government and civil society working together, we can achieve 100% access to safe and sustainable WASH in the workplace, supply chains and communities by 2030, and deliver the SDGs.

### **To build a strong business, take the following actions:**

- Invest in WASH in the workplace, supply chains and communities.
- Seek expert advice to learn how and where your organisation can benefit from WASH intervention.
- Understand the private sector's role in managing and mitigating social, economic and environmental risks.
- Become a water steward in your sector and make sustainable WASH a unique selling point of your business.



How could your company benefit from WASH investment?  
To find out, visit  
**[wateraid.org/boosting-business](https://wateraid.org/boosting-business)**





● Front cover image:  
Employees pick tea at the  
Nagrifarm tea estate in  
Darjeeling, India. May 2022.

**WaterAid is an international not-for-profit, determined to make clean water, decent toilets and good hygiene normal for everyone, everywhere within a generation. Only by tackling these three essentials in ways that last can people change their lives for good.**

● Employees carry the tea they have picked, ready to be weighed at the Nagrifarm tea estate in Darjeeling, India. May 2022.

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**WASH**  
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