

Emerging Trends in WASH Related GHG Emissions Across Small Towns in South Asia

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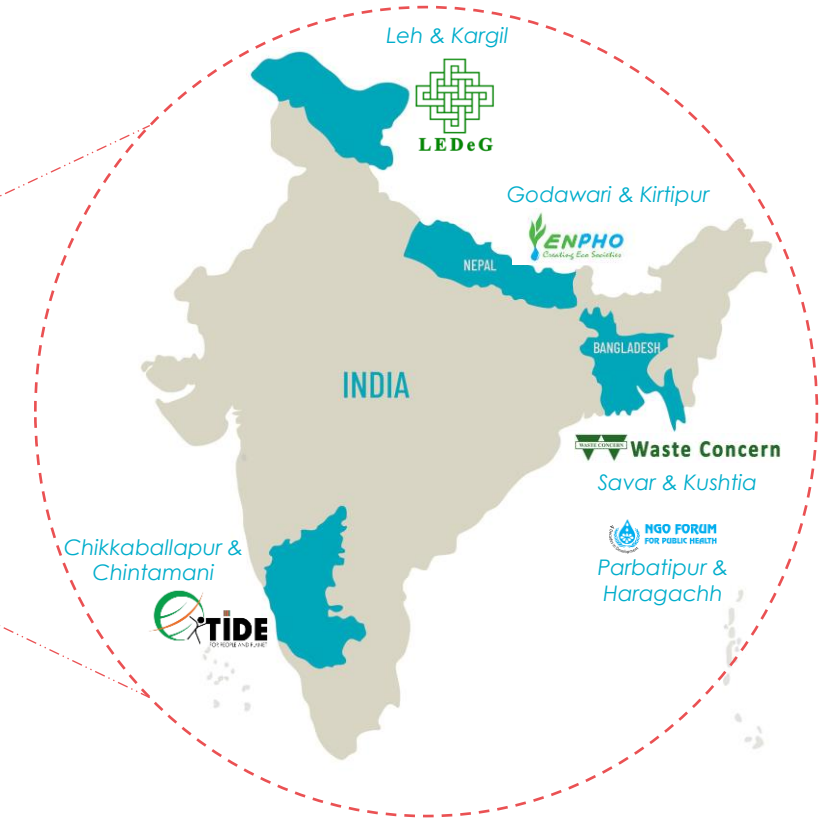
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Geographic Presence



Active since **1977**



3 countries; **10** towns in South Asia



46 motivated professionals in South Asia

Context – Why Small Towns in South Asia?



South Asia is a region characterized by its significant vulnerability to climate change



Home to a quarter of earth's population



Facing severe threats from extreme weather events, rising sea levels, and changing monsoon patterns



Millions affected by climate-related disasters over the past two decades

Climate Change Impacts on WASH

When water, sanitation, and hygiene (WASH) services are interrupted, the repercussions are profound



Health deteriorates



Nutrition suffers



Educational access is hindered



Livelihoods are jeopardized, especially for vulnerable communities in small towns



Climate change tends to widen inequalities in WASH access

Climate change exacerbates existing vulnerabilities in WASH services

- ❖ Floods and droughts damage infrastructure, disrupt service delivery and compromise access to safe drinking water and sanitation facilities.
- ❖ Increased rainfall causes flooding, that damages water supply systems, while prolonged droughts can reduce water availability, impacting WASH services.
- ❖ Poor WASH services increase health risks during climate related disasters – flooding can lead to contamination of water supply systems with pathogen, heightening the risk of waterborne diseases.

WASH related GHG emissions

Greenhouse Gas Emissions in Water and Waste Sectors

Carbon dioxide (CO ₂)	Methane (CH ₄)	Nitrous oxide (N ₂ O)
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Wastewater Treatment

Emissions from methane and nitrous oxide during anaerobic treatment processes.

Hydrofluorocarbons (HFCs)	Perfluorocarbons (PFCs)	Sulfur hexafluoride (SF ₆)	Nitrogen trifluoride (NF ₃)
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Water Extraction and Supply

The primary source of indirect emissions in the water sector is due to energy use in pumping.

Solid Waste Management

Emissions throughout the garbage collection, transportation, treatment, and disposal processes.



WASH related GHG emissions account for **4%** of direct global GHG emissions

Methodology, and a Caveat

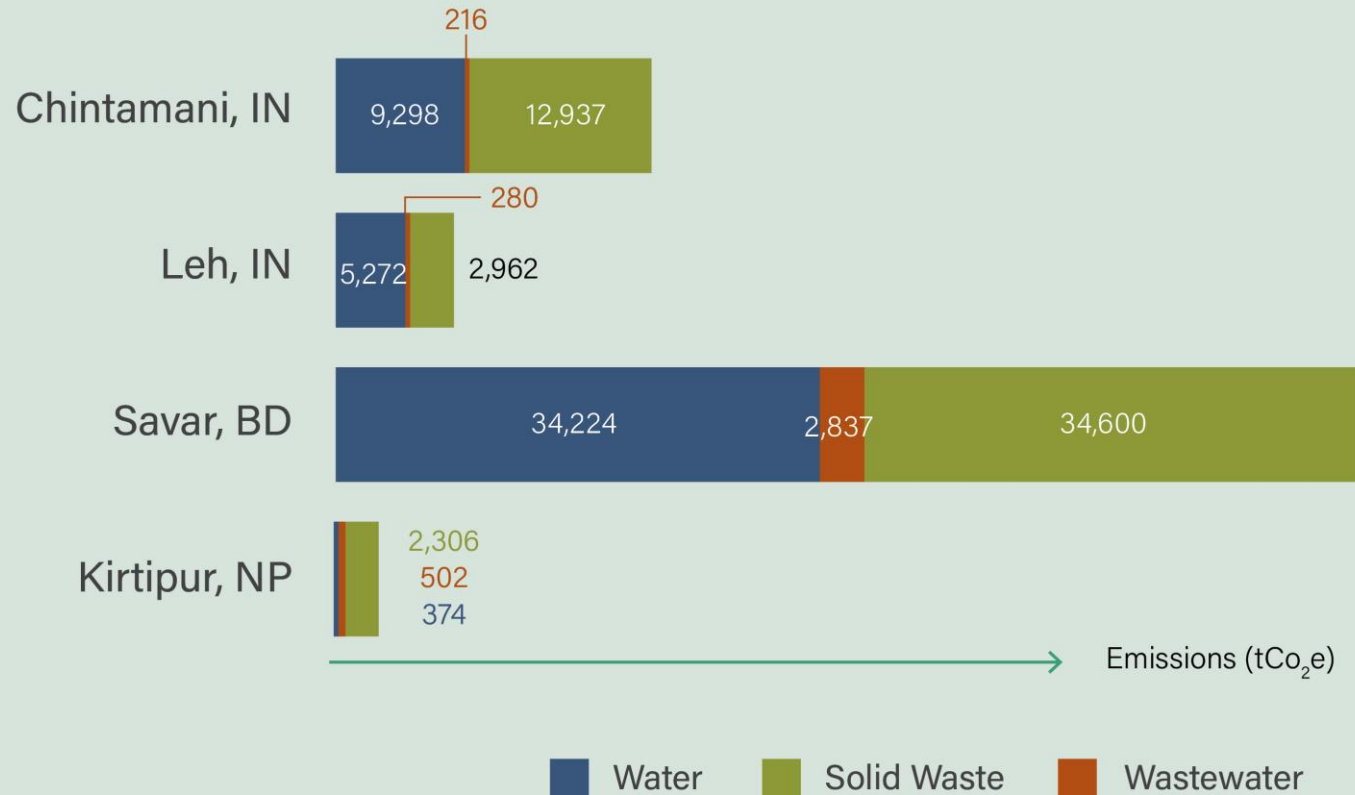
We want to make WASH climate resilient, low-emitting and sustainable. The first step is building an inventory.

Emission Assessment Process



Solid waste emissions top the chart

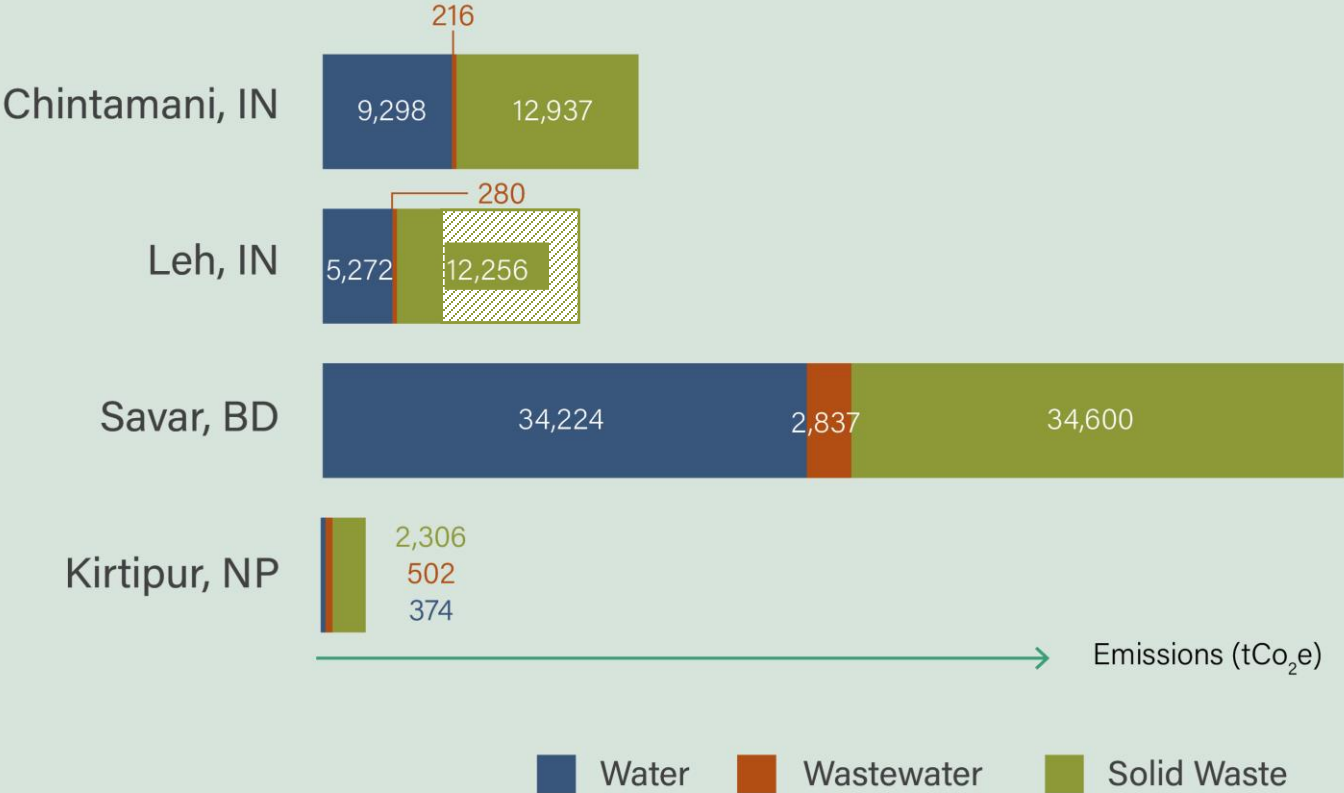
WASH GHG Emissions in 4 Towns



Emissions from solid waste, including legacy waste are the highest contributors across all the 4 pilot towns, except for Leh, where the 100,000 MTs of legacy waste was recently remediated. Contributions from legacy waste alone make up about **57%** total solid waste emissions from Chintamani, India and **48%** of total solid waste emission from Savar, Bangladesh respectively.

Avoided Emissions

WASH GHG Emissions in 4 Towns

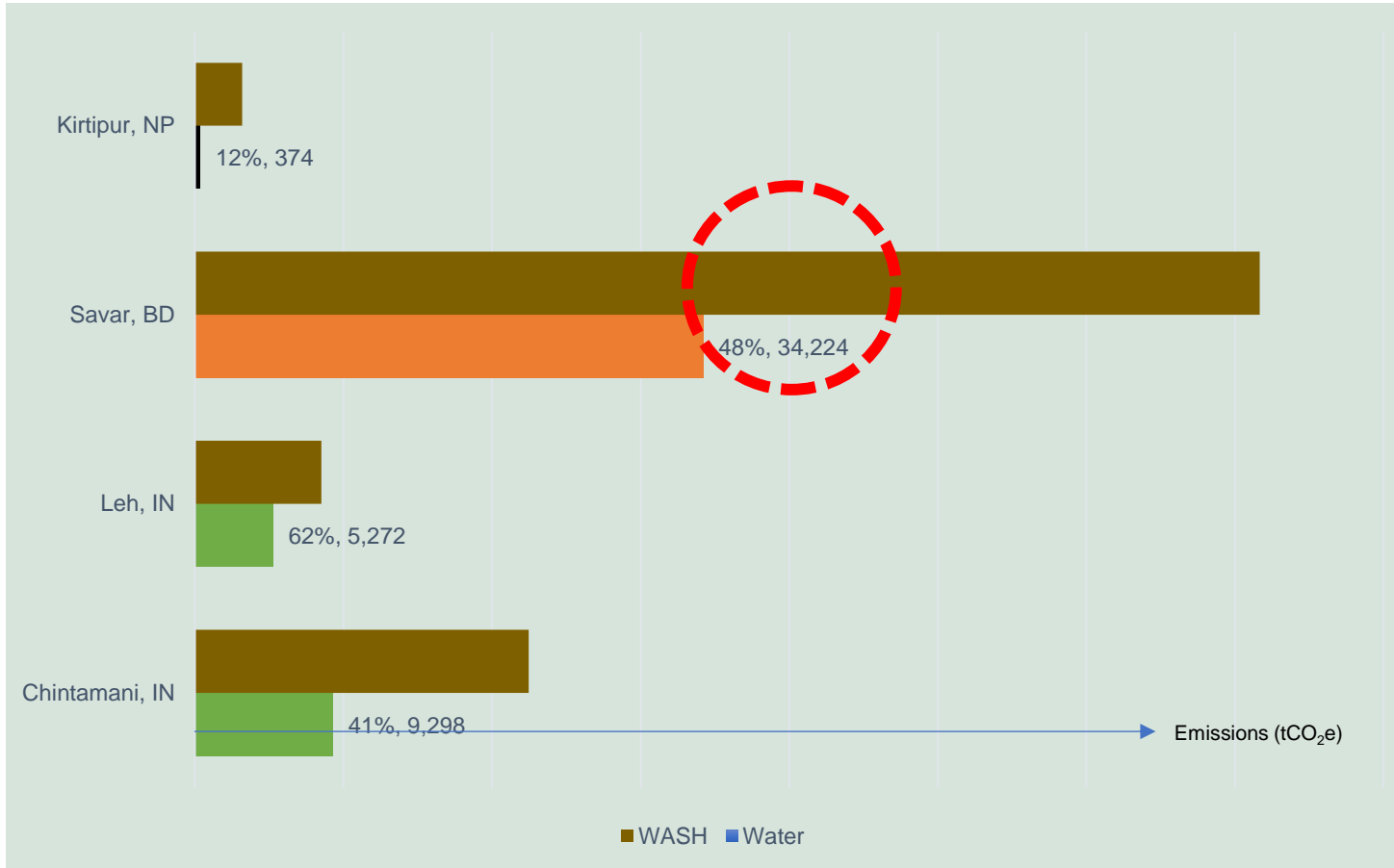


Our calculation shows that remediated 100,000 MT legacy waste would have added **12,256 tCO₂e** into the atmosphere, last year alone. That addition would account for **81% of solid waste** driven GHG emissions and **60% of total WASH** related emissions in Leh.

It would have also made Leh the highest emitter in terms of solid waste across all the 4 towns.

Similar scope has been identified in the other towns as well.

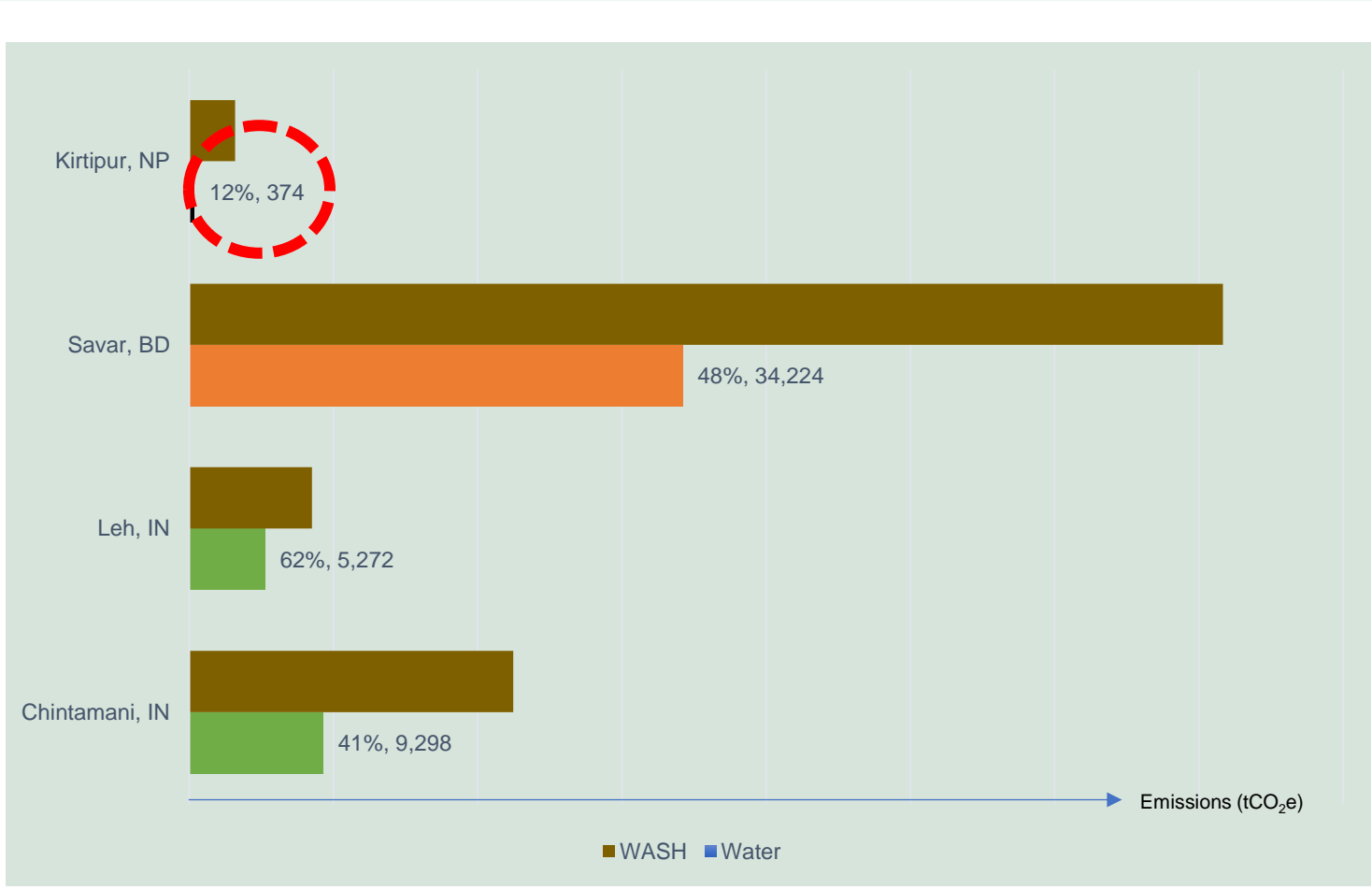
Recorded emissions from water and water supply systems are significantly different in Bangladesh and Nepal from India – our learnings



Savar is completely devoid of municipal water supply. So, it depends on its groundwater sources to fulfil this demand, by employing a mix of shallow and deep tubewells and borewells all of which are privately owned by the households or the community.

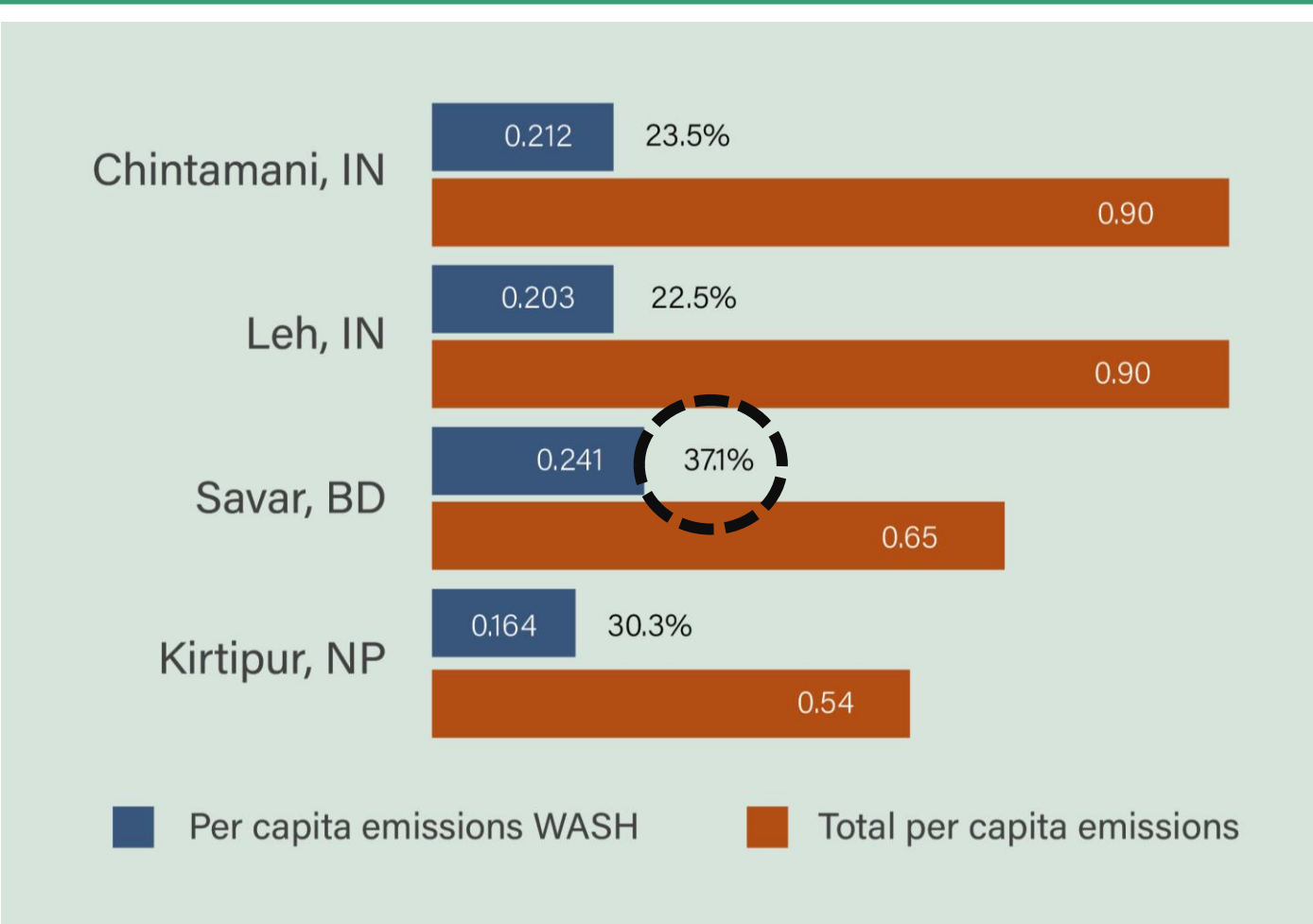
Subsequently, domestic pumping contributes almost all the water-related emissions which is a departure from the trend as noticed in the other three towns.

Recorded emissions from water and water supply systems are significantly different in Bangladesh and Nepal from India – our learnings



Kirtipur’s water demand is met by a combination of spring water and municipal supply which explains the low emission.

WASH Emissions Account for About 20-40% of Total Emissions

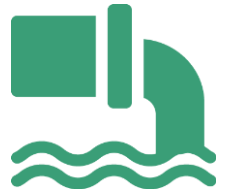


Savar has the highest per capita WASH emissions, in spite of being the most populated of the 4 towns.

Kirtipur has the lowest population amongst the 4 focus towns, which makes it a high per capita emitter in the WASH sector, followed by Chintamani, and Leh.

Learnings and Recommendations

Almost all the **emissions related to water** – extraction, treatment and pumping – is attributable to **grid derived electricity** – beyond the control of municipality



Wastewater management is a major concern in small towns – even in towns beyond the scope of the study

Solid waste – including fresh waste and legacy waste sites – emit large volumes of GHG including **methane, nitrous oxide and carbon dioxide.**



Climate resilience and climate change adaptation are usually overlooked at ULB level planning. Outcome based recommendations that tie in the climate lens has proven to be beneficial.

Thank You

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