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# TAX EXEMPTIONS: A CATALYST FOR DEMAND AND SUPPLY OF PLASTIC SANITATION PRODUCTS

## IMPACT ASSESSMENT REPORT – ETHIOPIA



**SEPTEMBER 2021**

This publication was produced for review by the United States Agency for International Development. It was prepared by Tetra Tech.

# ACKNOWLEDGEMENTS

This report was prepared by the USAID WASHPaLS and USAID Transform WASH projects. It was authored by Rishi Agarwal, Subhash Chennuri, and Abhishek Khanna from FSG (a WASHPaLS partner).

The authors would like to acknowledge the generous contribution and thought partnership of Kathrin Tegenfeldt (USAID Mission to Ethiopia), Monte Achenbach (Chief of Party, Transform WASH), Daniel Tesfaye (WASH Program Director, PSI Ethiopia), and Ephraim Mebrate (Research and Policy Advisor, IRC WASH).

The following individuals provided valuable inputs for our analysis: Lars Osterwalder (IRC WASH), Henok Getachew (PSI Ethiopia), Peter Feldman (Consultant), Guy Hutton (UNICEF), Julia Rosenbaum (FHI 360), Alicea Easthope-Frazer and Rachel Peletz (Aquaya Institute), Daniel Stein (IDInsight), Dr. Alemayehu Seyoum Taffesse (International Food Policy Research Institute), Mary Kincaid and Aditi Krishna (Iris Group).

The authors thank the following individuals for their feedback on the report: WASHPaLS Project Director Morris Israel (Tetra Tech), WASHPaLS Deputy Director Dr. Jeff Albert (Aquaya Institute), WASHPaLS Research Advisor Dr. Mimi Jenkins, Elizabeth Jordan (USAID), and Jesse Shapiro (USAID).

The authors would like to thank Riya Garg, Akshay Kohli, and Pallavi Kaul for their contributions to this document. Kashmira Ranji provided invaluable logistical and other support.

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Preferred citation: USAID, 2021. *Tax Exemptions: A Catalyst for Demand and Supply of Plastic Sanitation Products: Impact Assessment - Ethiopia*. Washington, DC., USAID Water, Sanitation, and Hygiene Partnerships and Learning for Sustainability (WASHPaLS) Project.

Prepared for the United States Agency for International Development by the Water, Sanitation, and Hygiene Partnerships and Learning for Sustainability (WASHPaLS) project, Task Order number AID-OAA-TO-16-00016 of the Water and Development Indefinite Delivery Indefinite Quantity Contract (WADI), contract number AID-OAA-I-14-00068.

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## **DISCLAIMER**

The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

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# ACRONYMS AND ABBREVIATIONS

CIF	Cost + Insurance + Freight
DST	Decision Support Tool
ESI	Economics of Sanitation Initiative
ETB	Ethiopian Birr
GoE	Government of Ethiopia
GTP	Growth and Transformation Plan
NGO	Nongovernmental Organization
ODF	Open Defecation Free
OWNP	ONE WASH National Programme
pp	Percentage Point
T/WASH	Transform WASH
USAID	United States Agency for International Development
VAT	Value Added Tax
WASH	Water Supply, Sanitation, and Hygiene
WASHPaLS	Water, Sanitation, and Hygiene Partnerships and Learning for Sustainability
WSP	Water and Sanitation Program

## I.0 EXECUTIVE SUMMARY

Ethiopia has made remarkable progress towards meeting its Sustainable Development Goal 6 commitments, going from just 11 percent rural sanitation coverage in 2000 to 71 percent in 2017. However, most (88 percent) rural households with toilets have unimproved sanitation facilities that expose users to fecal matter. The prevalence of unimproved sanitation facilities is due to the persistent lack of affordable or desirable options to construct an improved toilet.

USAID, through the Transform WASH (T/WASH) project, is collaborating with other development partners like UNICEF to support the Government of Ethiopia (GoE) in addressing this problem by introducing innovative, low-cost sanitation products (such as plastic pans and slabs) in Ethiopia. These products are, at present, exempted temporarily from import duties and domestic taxes because they are procured by agencies such as USAID and UNICEF. But the retail price will increase significantly when the private sector fully assumes procurement and distribution because of applicable taxes/tariffs.

The GoE is considering a policy of fiscal exemptions (import duties and domestic taxes collectively referred hereon as **tax exemptions**) to improve the affordability of a range of WASH products, including plastic sanitation products. Improving affordability could potentially contribute to the GoE's ONE WASH National Programme (OWNP) Goal 2, i.e., a 52 percentage point increase in improved rural sanitation coverage. However, the GoE will likely consider tax exemptions for a limited period because it aims to establish a local private sector supply of WASH products, as per OWNP Goal 5, and the broader Growth and Transformation Plan (GTP) II Section 4.2.

The critical decision-making questions for implementing the said policy are **what is the magnitude of its benefits, and how do they compare with the costs?** USAID tasked the Water, Sanitation, and Hygiene Partnerships and Learning for Sustainability and T/WASH projects to assess the potential impact of tax exemptions to inform and aid the GoE's decision-making. The impact assessment makes a **compelling case for implementing the policy** because it can contribute to two GoE goals, and the economic benefits significantly outweigh the costs.

First, tax exemptions can **potentially increase improved rural sanitation coverage by up to 13 percentage points**, contributing to OWNP Goal 2. Tax exemptions will reduce the price of plastic sanitation products and improve affordability across income segments. The potentially higher demand can increase improved sanitation coverage, provided the market develops (e.g., high customer awareness and wide distribution networks) due to both deliberate interventions and market evolution. A sub-set of households without toilets, the majority from the "bottom 40%" income segment, will still need additional support because of the installation costs associated with building new toilets with plastic sanitation products.

Second, tax exemptions can also **potentially incentivize domestic manufacturers to enter the market**, contributing to OWNP Goal 5 and GTP II Section 4.2 targets. Lower prices due to tax exemptions can boost demand and sales, providing manufacturers with proof of the market's attractiveness. Domestic manufacturers still need support with interventions to overcome other barriers to market entry and operating profitably.

Third, the policy can generate **potential cost savings of up to ETB 637 million** for the OWNP, which is significantly greater than the tax/tariff revenue that the government will forego due to exemptions (up to ETB 14.6 million). The increased coverage of improved sanitation due to tax exemptions will also lead to potential health benefits, which have an economic value of ETB 1.7 billion.

Like most interventions, a tax exemption policy alone will be ineffective. It will require complementary interventions such as market development and targeted subsidies to reach lower-income households, thus realizing the GoE's universal coverage goal. Moreover, tax exemptions cannot be granted in perpetuity and will need sunset clauses to align with the GoE's goal of promoting domestic manufacturing. Considering these factors, we recommend a 3-phase strategy for the GoE to achieve its goals.

The GoE should start by **seeding the market** through full exemptions on plastic sanitation products to stimulate adoption and increase awareness. It should also address key barriers to private sector investment to incentivize the entry of domestic manufacturers. The key outcome of Phase 1 will be the entry of domestic manufacturers (e.g., 2-3 plastic manufacturers) into the market.

The GoE can then shift to **localizing the market** through import substitution (by removing exemptions on customs and surtax but retaining value-added tax exemptions) and support manufacturers to address operational barriers. The key outcome of Phase 2 will be more domestic manufacturers (e.g., 3-5 manufacturers) and high improved sanitation coverage (e.g., more than 80 percent) in several regions.

In the final phase, the GoE can reach **the poorest** unserved households through targeted, market-compatible subsidies. The key outcome of Phase 3 will be universal improved sanitation coverage.

All three phases will require the GoE's continued engagement with nongovernmental organization (NGO) and private sector actors to develop the market and realize the full potential of the policy.

## 2.0 INTRODUCTION

Ethiopia has made remarkable progress towards meeting its Sustainable Development Goal 6 commitments, going from just 11 percent rural sanitation coverage in 2000 to 71 percent in 2017 (WHO/UNICEF, 2017). The rate of reduction of open defecation is recognized as among the fastest globally.

Rural sanitation coverage in Ethiopia continues to increase, but most (88 percent) rural households with toilets have unimproved sanitation facilities (WHO/UNICEF, 2017). The use of unimproved sanitation facilities means that the waste is still open to the environment and is a potential source of disease-causing pathogens. These types of facilities do not meet the WHO/UNICEF’s Joint Monitoring Program’s standard for “improved sanitation facilities.” The prevalence of unimproved sanitation facilities is due to the persistent lack of affordable and convenient options in Ethiopia. Households typically build the toilet interface using locally available materials (such as wood or mud) that do not provide the benefits of improved sanitation facilities, i.e., hygienic separation of waste from human contact. Improved sanitation facilities, such as those with concrete or ceramic interfaces, are typically cumbersome to install or expensive (iDE and UNICEF, 2013). Most available options cost more than ETB 2,000, or more than 34 percent of the median monthly rural household expenditure (CSA, 2016).

To aid the Government of Ethiopia (GoE) meet its goal of universal sanitation coverage, the USAID Transform WASH (T/WASH) project, in collaboration with partners such as UNICEF and private sector actors, is facilitating the introduction of innovative, low-cost sanitation products such as plastic pans and slabs (see Figure 1 and Figure 2). These products are relatively cheaper (costing less than ETB 1,000) than concrete or ceramic alternatives and also qualify as improved sanitation facilities. A functioning market for plastic sanitation products will present rural households with a practical, affordable option to gain access to improved sanitation facilities. Products such as the plastic pan have already shown strong potential, with ~23,000 units sold between March 2018 and December 2019.<sup>1</sup>

**Figure 1: Plastic pan example: SATO pan**



**Figure 2: Plastic slab example: AIM plastic slab**



Source: T/WASH report (USAID, 2019)

Currently, the products are imported by USAID and UNICEF through humanitarian assistance channels and are, therefore, granted an exemption from import duties and domestic taxes. While T/WASH is collaborating with the private sector to localize the value chain, reliance on imports is expected to continue, at least in the short term. Once the private sector assumes import and distribution, we estimate that the retail price of these products could increase by ~35 percent due to applicable import duties and domestic taxes. Higher prices will dampen demand by making the products unaffordable for a large share of rural households without improved toilets.

<sup>1</sup> Data shared by T/WASH

Therefore, the GoE is considering reducing taxes and tariffs on a range of WASH products, including plastic sanitation products, to improve affordability. The potential improvement in affordability can contribute to GoE's ONE WASH National Programme (OWNP) Goal 2 of 54 percentage points (pp)<sup>2</sup> increase in rural improved sanitation coverage (OWNP, 2018). The GoE is also likely to consider implementing a tax exemptions policy for a limited period because it wants to promote the domestic private sector supply of WASH products, as per OWNP Goal 5 and Section 4.2 of the Growth and Transformation Plan (GTP) II (National Planning Commission, Government of Ethiopia, 2016). A critical decision-making factor for implementing the fiscal policy is its potential benefits and costs.

In this context, USAID commissioned the Water, Sanitation, and Hygiene Partnerships and Learning for Sustainability Project (WASHPaLS), in collaboration with T/WASH project, to conduct an impact assessment and inform the GoE's decision. This document is a detailed report of the impact assessment, which is organized as follows:

- Scope of the impact assessment
- Overview of the applicable taxes and tariffs on plastic sanitation products
- Methodology
- Key findings
- Policy recommendations
- Limitations of the impact assessment

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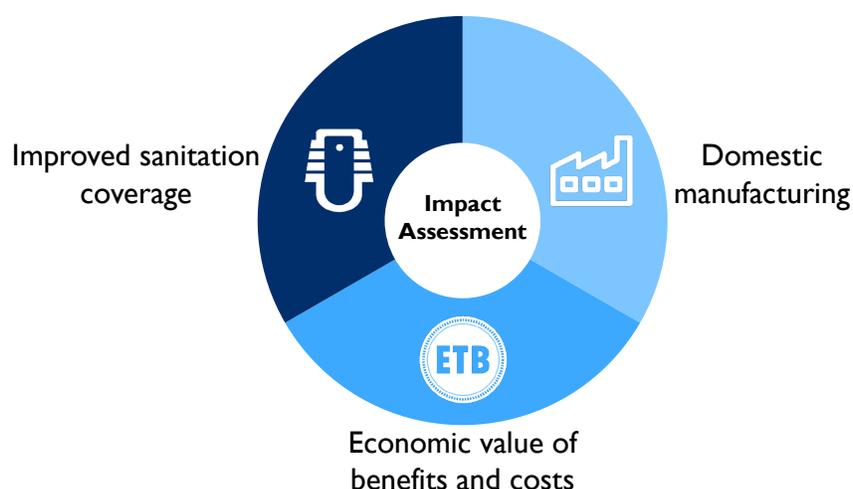
<sup>2</sup> The 54pp increase is the difference between the improved rural sanitation baseline coverage of 28 percent and the target coverage of 82 percent, as per the OWNP Phase II Sanitation and Hygiene Strategy (OWNP, 2018). We understand that the baseline figure was revised later to 9 percent, as per the WHO/UNICEF Joint Monitoring Program. Our analysis uses the 54pp increase as the anchor OWNP target, instead of a specific coverage level.

## 3.0 SCOPE

Our impact assessment sought to answer three key questions, focusing primarily on the benefits and costs, that will inform the GoE’s decision to implement a policy of tax exemptions (see Figure 3):

- Can the policy increase rural **improved sanitation coverage**<sup>3</sup>, thus contributing to OWINP Goal 2?
- Can the tax exemptions boost **domestic manufacturing**, contributing to OWINP Goal 5 and GTP Section 4.2?
- What are the economic **costs and benefits** of this policy?

**Figure 3: Scope of the impact assessment**



We answered the above questions assuming a long-term horizon (5-10 years), when the market for plastic sanitation products in Ethiopia will likely mature. Such a market, in general, will be characterized by high levels of product awareness and convenient access to plastic sanitation products across rural Ethiopia. The current market is still nascent, with both product awareness and supply restricted to the woredas where development partners, such as T/WASH, operate. Further, markets develop due to several factors, including interventions by the government, private sector, and development organizations. Therefore, our analyses present the “potential” outcomes of the policy in the long-term because markets evolve over time, and a short-term view may not present the full potential of the policy. Our recommendations also note other complementary interventions needed to develop the market and realize the policy’s potential outcomes.

Our scope is limited to analyzing the impact of tax exemptions on plastic pans only, and not all plastic sanitation products. This is because plastic pans are the most widely available plastic sanitation products relative to others (e.g., plastic slabs, toilet stools) in Ethiopia. Budget and time considerations also prevented us from considering all plastic sanitation products. However, we believe that the findings from this impact assessment are broadly applicable to most plastic sanitation products since they have similar features (such as improved hygiene) and additional installation requirements.

<sup>3</sup> Our analysis of improved sanitation coverage includes households with basic sanitation facilities (a private improved toilet) and limited sanitation facilities (an improved toilet shared with other households).

## 4.0 APPLICABLE TAXES/TARIFFS ON PLASTIC SANITATION PRODUCTS

The value chain for plastic sanitation products consists of three stages—import, distribution, and retail—and these products will be subject to four taxes/tariffs described in Table 1 (USAID, 2019).

**Table 1: Description of taxes/tariffs applicable to plastic sanitation products**

Type of tax/tariff	Description	Rate for plastic sanitation products
<b>Customs duty</b>	<ul style="list-style-type: none"> <li>Tariff levied on imported goods</li> <li>Applicable on the CIF (cost + insurance + freight) value of the imported item.</li> <li>Applied only at the <b>importer level</b></li> </ul>	30%
<b>Surtax</b>	<ul style="list-style-type: none"> <li>Additional tax levied on imported goods</li> <li>Applicable on the sum of CIF, customs duty, and VAT</li> <li>Applied only at the <b>importer level</b></li> </ul>	10%
<b>Value Added Tax (VAT)</b>	<ul style="list-style-type: none"> <li>Sales tax on all goods/services sold by VAT-registered sellers (i.e., sellers with an annual turnover of more than ETB 1 million)</li> <li>Applied on the value-added by a value chain player (i.e., the difference between the selling price and buying price)</li> <li>Applicable only at the <b>importer and distribution level</b>, as retailers typically have an annual turnover of less than ETB 1 million</li> </ul>	15%
<b>Withholding tax</b>	<ul style="list-style-type: none"> <li>Tax paid on transactions greater than ETB 10,000, which can be credited towards a taxpayer's annual income tax liability</li> <li>Applied on the CIF value of an imported item</li> <li>Applicable only at the <b>importer level</b>, as transactions at the distributor and retailer levels will typically be less than ETB 10,000</li> </ul>	3%

Excise tax may be applicable on imported goods. But excise tax is not levied on sanitation products because it is typically applied to luxury goods or consumer products that are considered harmful to health and social welfare.

## 5.0 METHODOLOGY

The core analytical tool of the impact assessment was a decision-support tool (DST) developed by the USAID/WASHPaLS project.

### Box 1. What are DSTs and why did WASHPaLS use them?

DSTs are simplified models of complex systems designed to estimate a range of potential outcomes of a decision (such as the implementation of a policy). They are typically developed using mathematical modeling or spreadsheet software (e.g., Microsoft Excel).

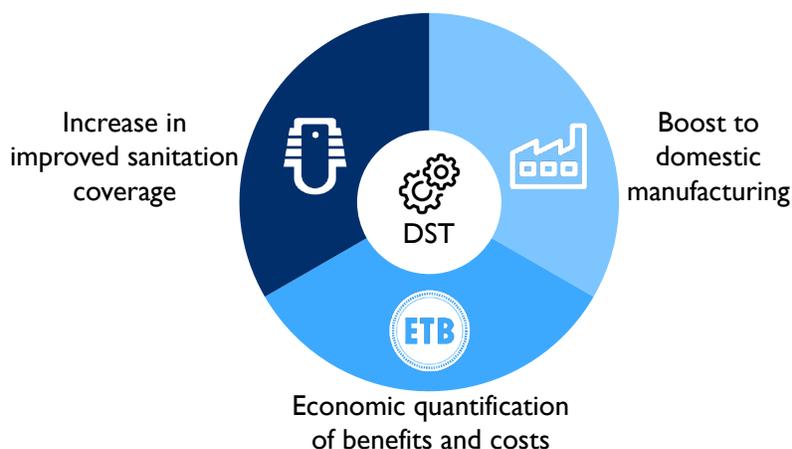
WASHPaLS promoted the use of DSTs for sanitation policymaking after finding few precedents and limited evidence on the efficacy of sanitation policies globally. The lack of evidence is likely to impede decision-making on sanitation-related market rules by policymakers and make it equally challenging for other stakeholders to advocate for changes in market rules (USAID, 2018).

In this context, DSTs offer an alternative approach to estimate the potential impact of policies and facilitate decision-making and were well-suited for conducting this impact assessment.

We used the outputs of the DST with additional analysis to answer the three questions of our scope:

- **Increase in improved sanitation coverage:** The DST gave us an estimate of the change in rural improved sanitation coverage, overall and by income segments, for different scenarios of exemptions
- **Boost to domestic manufacturing:** We analyzed the incentives for domestic manufacturers to assess the policy's potential in encouraging domestic manufacturing
- **Quantification of costs & benefits:** The DST gave us an estimate of the cost of implementing the policy, i.e., the revenue foregone by the government. We conducted additional analyses to quantify two benefits:
  - The monetary benefit of cost savings for Ethiopia's OWNPs
  - The non-monetary health benefits of increasing access to improved sanitation

Figure 4: Methodology of our impact assessment



The subsequent sections present a brief overview of our analysis. A separate *Technical Supplement* document provides more details of select activities specified in this section.

## 5.1 INCREASE IN IMPROVED SANITATION COVERAGE

We developed a DST that estimates the change in improved sanitation coverage for different scenarios of tax/tariff reductions relative to the fully loaded price, i.e., the price with all relevant taxes/tariffs applied when the private sector assumes supply.

We defined three scenarios of tax exemptions in the DST:

- VAT exempt
- Customs + surtax exempt
- Fully exempt (i.e., no VAT, customs, and surtax)

While our DST allows analyses of impacts at different taxes/tariff rates (and not only a full exemption), products in Ethiopia are typically either completely exempt from a particular tax/tariff or subject to the applicable rates as described in the previous section. We also ignored withholding tax from our scenarios because its contribution to the total cost of the plastic pan is negligible (1 percent), and it may be impractical to remove.

For each scenario, the DST estimated the change in improved sanitation coverage by calculating the:

- Fully loaded price and the price after various exemptions; and
- Demand at each price point.

### 5.1.1 CALCULATING PRICES

The DST calculated the fully loaded price based on the current value chain costs and markups, and the applicable tax/tariff rates. We sourced the value chain costs, markups, and tax/tariff rates from a study (USAID, 2019), and verified them through interviews with domestic value chain players.

The price after exemptions was based on the same value chain costs and markups, but the exempted tax/tariff rates were entered into the model.

### 5.1.2 CALCULATING DEMAND

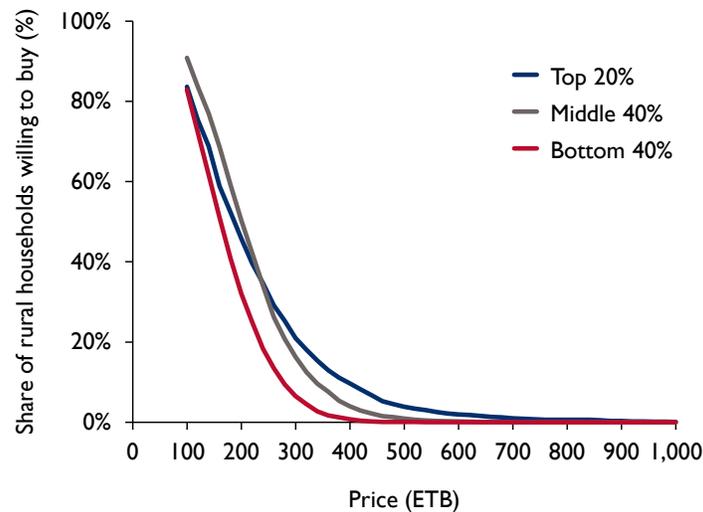
The DST calculated the demand by using a demand curve, a critical input because it estimates the proportion of households in the target market that will be able to afford, and potentially demand, plastic pans at different price points. However, a demand curve for plastic pans in Ethiopia does not exist. While we planned to conduct an auction study in Ethiopia to build a demand curve based on primary data, COVID-19 restrictions prevented us from doing so. To overcome this challenge, we developed demand curves for this analysis that are synthetic constructions using household expenditure data in Ethiopia (CSA, 2016). We constructed separate demand curves for three household income segments (see Figure 5):

- “Top 20%” of *per capita annual household expenditure*
- “Middle 20%-60%” of *per capita annual household expenditure* (the “middle 40%”)
- “Bottom 40%” of *per capita annual household expenditure*

We used expenditure as a proxy for income because reliable data on income for rural Ethiopia is not available. We used “per capita” household expenditure (instead of total household expenditure) to categorize the segments because it accounts for the household size and is a better indicator of household income level. The *Derivation of Synthetic Demand Curves* section of the *Technical Supplement*

provides further details on the derivation of the demand curves and our approach for validation. Primary research, using methods such as auctions, if conducted could validate the synthetic demand curve.

**Figure 5: Potential demand for plastic pans by household income segment**



The DST estimated the potential demand at each price by multiplying the proportion of households that demand plastic pans at a given price (from the demand curve) with the size of the target market. We defined the target market as rural households without improved sanitation because providing them with hygienic interfaces (such as the plastic pan) will increase improved sanitation coverage.

The DST assumes that the potential demand at each price translates into purchase and usage by taking a long-term view (refer to the Scope section). Based on this assumption, the DST calculated the potential change in coverage for each scenario. The *DST Model Logic* section of the *Technical Supplement* provides further details on the calculations of the DST.

## 5.2 BOOST TO DOMESTIC MANUFACTURING

At present, plastic sanitation products are not manufactured in Ethiopia. Therefore, we analyzed the incentives of domestic manufacturers of plastic or WASH products for entering the market for plastic sanitation products (see the *List of Value Chain Interviews* section of the *Technical Supplement*). We targeted these manufacturers because they are more likely than others to enter this market because of adjacencies, i.e., they have similar procurement, manufacturing processes, and/or distribution mechanisms in use for their current products. We conducted the following analyses to understand their incentives:

- **Breakeven analysis:** A quantitative analysis of the minimum annual volumes (breakeven point) required to profitably manufacture plastic pans. Domestic manufacturers are primarily motivated by a large market size like any other business. We compared the additional demand generated by tax exemptions with manufacturers' stated expectations and the breakeven point to assess if the market size could attract manufacturers.
- **Barriers-to-entry analysis:** A qualitative analysis of the barriers to entering and profitably operating plastic sanitation products. Notwithstanding the market size, domestic manufacturers can face several barriers to starting and operating a business. We identified the most critical barriers that potential policy interventions could address.

## 5.3 COSTS & BENEFITS

### 5.3.1 FOREGONE GOVERNMENT REVENUE

The DST estimated the government revenue for the three scenarios of tax/tariff reductions, similar to the process described in the *Increase in improved sanitation coverage* section above. In each scenario, the government's revenue after reducing taxes and/or tariffs was deducted from the revenue that it would have earned otherwise from the fully loaded price. The results represent the revenue foregone (or gained in two scenarios) by the government due to the implementation of the policy.

### 5.3.2 OWNPN COST SAVINGS

The OWNPN estimated the costs required to achieve its targets as part of its Phase II Rural Sanitation and Hygiene Physical and Financial Plan. We evaluated if a policy of tax exemptions can reduce the costs of achieving the stated target of 54pp increase in rural sanitation coverage (OWNPN Goal 2). This involved:

1. Calculating the “cost per pp increase in sanitation coverage” by dividing the total estimated cost of taking villages to primary open defecation free (ODF) status (ETB 2.8 billion) with the resulting pp increase in improved sanitation coverage (54pp); this represents the estimated OWNPN cost of improving coverage by 1pp of rural households
2. Subtracting the estimated pp increase in rural sanitation coverage due to tax exemptions from the OWNPN target (54pp); this represents the reduced unserved population that the OWNPN needs to target since a part of the coverage increase has been achieved through tax exemptions
3. Multiplying the difference with the OWNPN cost incurred per pp increase (estimated as per step 1); this represents the cost of improving the coverage of the reduced unserved population
4. Comparing the OWNPN estimated cost (ETB 2.8 billion in Step 1) with the reduced total cost (i.e., the sum of the cost of serving the reduced population in Step 3 and the cost of tax exemptions)

The OWNPN targets and costs were sourced from the Phase II Rural Sanitation and Hygiene Physical and Financial Plan (OWNPN, 2018). The analysis assumes that the OWNPN's “cost per pp increase in sanitation coverage” remains constant across different levels of coverage increase. We are unable to make refined assumptions because we did not have access to the breakdown of the OWNPN costs, such as fixed and variable components. If we had this breakup, we would have multiplied only the “variable costs per pp increase” with the reduced population, as the fixed costs will be incurred regardless of coverage levels.

### 5.3.3 HEALTH BENEFITS

We quantified the economic value of the health benefits of tax exemptions by adapting an existing methodology—the Water and Sanitation Program's (WSP) Economics of Sanitation Initiative (ESI) for the Ethiopian context.

We adapted the ESI methodology for Ethiopia by entering Ethiopia-specific data and assumptions into a tool developed by the WSP and tailored by UNICEF. The tool gave us a monetary value of the average annual health benefits per household that can be generated through the use of improved sanitation facilities (such as the plastic pan).

We aimed to generate a conservative estimate of health benefits because it is compared to the monetary costs of implementing the policy (i.e., the foregone revenue). We included only the impact of diarrhea in our analysis and used conservative assumptions wherever required. This value was multiplied with the additional households that can afford plastic pans (after tax exemptions) to estimate the potential economic value of the annual health benefits of the policy.

The *Adaptation of ESI methodology* section of the *Technical Supplement* provides further details on our approach, including explanations of the different components, the specific data, and the assumptions entered into the tool. Please contact the WASHPaLS Project Director for the *technical supplement*.

# 6.0 KEY FINDINGS

The impact assessment makes a compelling case for implementing a policy of tax exemptions, as it can make a sizeable contribution to OOWNP goals, and the economic benefits of this policy significantly outweigh its costs. Our analysis highlights the following:



### Finding 1: Improved sanitation coverage

Tax exemptions can potentially increase improved rural sanitation coverage by **up to 13pp**, but **households without toilets may take longer** to benefit from the policy



### Finding 2: Domestic manufacturing

Tax exemptions can potentially **incentivize domestic manufacturers** to enter the market, but they will need **support to overcome key barriers** to investment and operations



### Finding 3: Costs & benefits

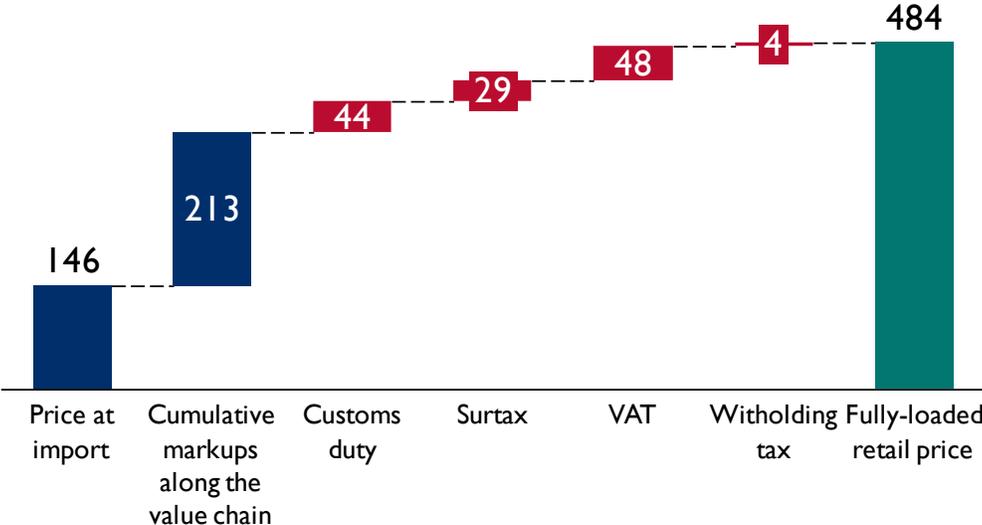
The potential cost savings and the economic value of health benefits generated by the policy **significantly outweighs** the tax/tariff revenue foregone by the government

## 6.1 FINDING 1: IMPROVED SANITATION COVERAGE

Our analysis highlights that tax exemptions are an effective mechanism to improve the affordability of plastic sanitation products and can potentially increase improved sanitation coverage across household income segments. Three factors drive this:

First, taxes/tariffs can constitute a significant share of the fully loaded retail price of plastic pans, amounting to approximately 35 percent (see Figure 6). As such, exemptions from taxes/tariffs can lead to a meaningful reduction in the retail price of plastic pans.

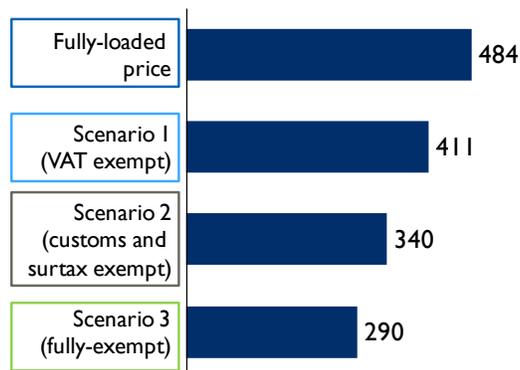
Figure 6: Breakup of the fully loaded price of plastic pans (ETB)<sup>4</sup>



<sup>4</sup> Excludes a) VAT at the retailer level assuming most retailers do not qualify for the VAT registration threshold, and b) withholding tax at the distributor and retailer levels assuming transactions are less than ETB 10,000, for which withholding tax is not applicable.

Second, our research suggests that taxes/tariffs exemptions will reduce retail prices because value chain players are likely to pass on the benefits of tax exemptions to consumers. We interviewed nine value chain players (a mix of importers, manufacturers, distributors, and retailers), who stated that they would maintain the same margin and, therefore, lower prices if taxes/tariffs were removed. Treating their assertions as an assumption that 100 percent of the fiscal benefit is passed to the consumer, the retail price will reduce significantly (by 15 to 40 percent for different scenarios), as shown in Figure 7.

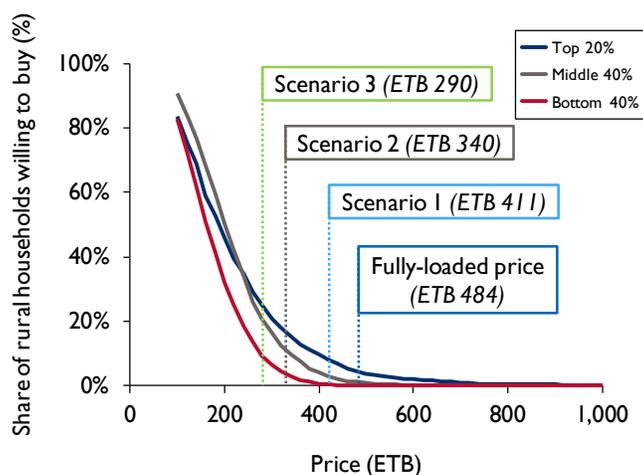
**Figure 7: Retail price of a plastic pan (ETB) for different exemptions<sup>5</sup>**



We recognize that this stated preference may not necessarily translate to actual behavior. However, we understand that the GoE, in general, has mechanisms to monitor prices and ensure that consumers benefit from tax exemptions. For example, broadcasting prices in certain T/WASH *woredas* have proven effective in raising price awareness and pricing consistency, which can be leveraged to ensure value chain players pass through fiscal benefits to consumers. The GoE can develop such mechanisms centrally because it is considering exemptions for several socially beneficial products.

Third, the price reductions will make plastic pans more affordable and can significantly increase the demand for plastic pans as the demand curve is highly sensitive to a change in price across income segments. As Figure 8 illustrates, in each of the three scenarios, tax exemptions will increase the demand relative to the fully loaded price because sensitivity is high at price points less than ETB 400.

**Figure 8: Potential demand for plastic pans for different prices by household segment**



<sup>5</sup> The reduction in prices is different from the value of the tax/tariff in the fully loaded price (Figure 6) as any exemption has a multiplier effect through the value chain on the retail price.

This higher demand can potentially increase improved sanitation coverage in the long term if it translates to purchase and usage (see Figure 9). The current rural improved sanitation coverage stands at 8.50 percent. If tax exemptions are not provided, then the maximum long-term coverage that can be attained through sales and usage of plastic pans will be 9.72 percent (including the current coverage). However, if prices are reduced through tax exemptions, coverage can increase to 22.37 percent in the long term (for the fully exempted price). This represents a 12.65pp increase compared to the scenario of not providing exemptions and highlights the efficacy of this policy to contribute to OOWNP Goal 2 of achieving a 54pp increase.

**Figure 9: Rural improved sanitation coverage – number of households (M) and rate (%)**

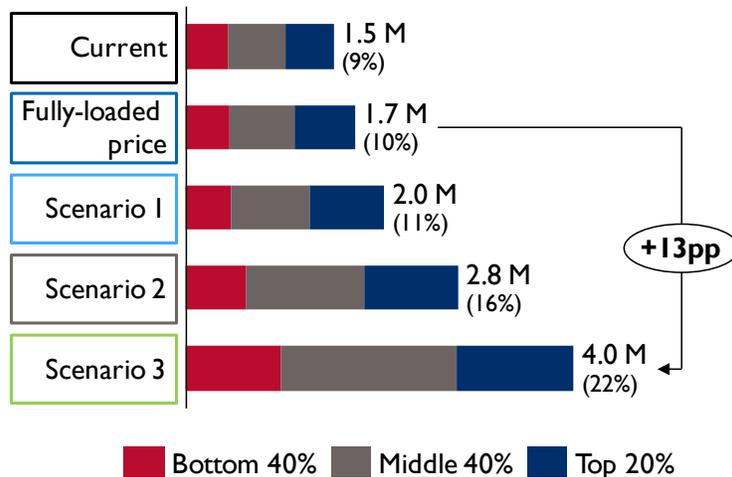


Figure 9 also illustrates that all household income segments can benefit from this policy, but the time required for households to gain access to improved sanitation due to this policy will likely differ. Accumulating materials or cash required to build a toilet over time to match cash flows is common practice among households in Ethiopia (iDE and UNICEF, 2013). Households with existing toilets, even if unimproved, do not need to spend on digging a new pit and can start using the plastic pan immediately by retrofitting it on their existing toilet.

Households without sanitation facilities will, however, incur additional installation costs of digging a pit, which can cost between ETB 120-240 (iDE and UNICEF, 2013). Even though customers are likely to build a toilet eventually after accumulating materials (since we assume that a household is unlikely to purchase a plastic sanitation pan for another purpose), this practice can result in a lag between the time of purchase and access to improved sanitation. **Box 2** provides more details on the installation costs in Ethiopia.

## Box 2: Installation costs for plastic pans in Ethiopia

Installation costs for plastic pans in Ethiopia vary significantly and depend on several factors such as local availability of materials and labor, households' preference for self-installation, and their existing toilet infrastructure.

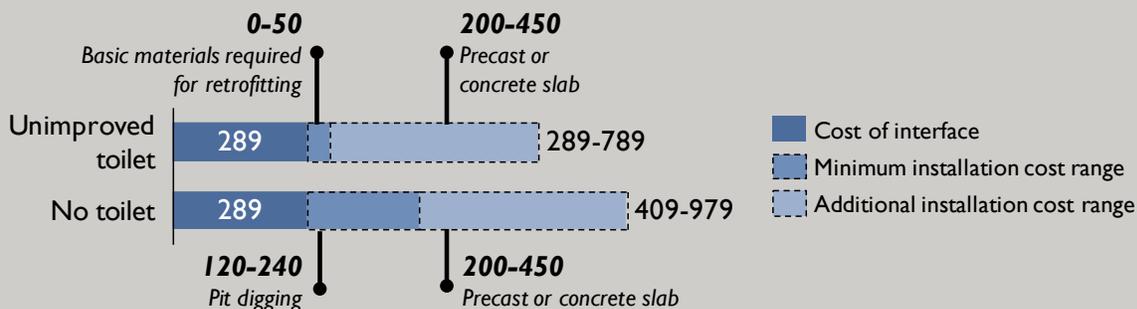
Broadly, installation costs can be categorized as “minimum” and “additional” installation costs. The minimum installation cost refers to the investment required to start using a toilet with a plastic pan. This may not eliminate the risk of contact with excreta. The additional installation cost refers to the investment required to properly fit the plastic pan and eliminate any risk of contact with excreta. Households will typically invest the “minimum” amount after purchasing a plastic pan. They may then choose to accumulate materials or cash over time for the “additional” investment (iDE and UNICEF, 2013).

The “minimum” investment required differs for households with or without existing toilets. Households without toilets need to dig a pit first, which can cost between ETB 120-240 in labor charges (depending on the depth). Households with existing toilets can retrofit the plastic pan on their existing pit and start using it. The “additional” investment will typically consist of a small precast slab (left) or a large concrete slab (right) to ensure the pan is properly situated.



Source: T/WASH

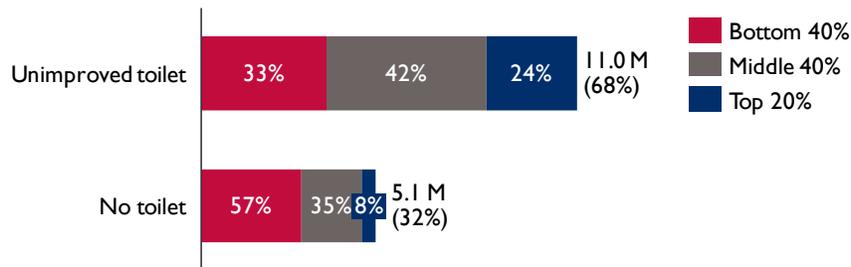
The below figure represents the range of the costs (ETB) of a toilet, assuming the price of a plastic pan at ETB 289 (i.e., the fully exempted price).



The issue of lag between purchase and usage for households without toilets is further challenged because such households typically consist of those that have less to spend. Households without toilets account for 32 percent of rural households without improved sanitation, but 57 percent of such households belong to the “bottom 40%” income segment (see Figure 10) (WHO/UNICEF, 2017). This segment may need additional support to access improved sanitation because tax exemptions alone may

not make plastic sanitation products affordable. This is consistent with USAID/WASHPaLS research in other countries, which makes a case for complementing market-based sanitation with other approaches such as subsidies to reach the poorest households (USAID, 2018). Our recommendations provide guidelines on market-compatible subsidies that can be leveraged to reach the poorest households.

**Figure 10: Rural households without improved sanitation (M) by toilet facility and by income segment**

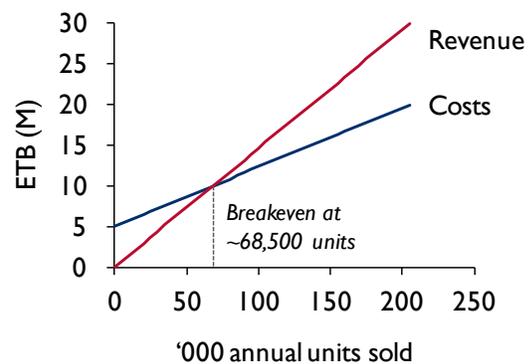


## 6.2. FINDING 2: DOMESTIC MANUFACTURING

Our research on domestic manufacturers highlights that tax exemptions can serve as a stimulus for boosting domestic manufacturing of plastic sanitation products. Still, domestic manufacturers will need support to overcome other barriers to entry.

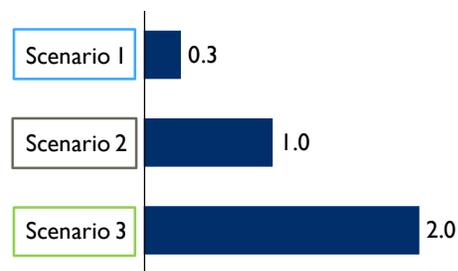
We interviewed domestic manufacturers of plastic or WASH products, as they are most likely to invest in an adjacent business line of plastic sanitation products. Like any private sector actor, these manufacturers are motivated by the market size of a new business, among other factors. Entering a new business requires an upfront investment, and manufacturers need to sell a minimum quantity to recover this investment and generate profits. One manufacturer estimates this minimum quantity at 50,000 units annually, while our preliminary breakeven analysis of manufacturing plastic pans suggests a minimum volume of 68,500 units (see Figure 11).

**Figure 11: Breakeven quantity for domestic manufacturing of plastic pans<sup>1</sup>**



The current sales of plastic pans, approximately 23,000 plastic pans sold between March 2018 and December 2019, are significantly lower than the breakeven quantity. The sales figures are likely to increase as development programs such as T/WASH scale efforts to expand the market to newer regions, but can further be boosted by providing exemptions to reduce the price of plastic pans and increase demand. The synthetic demand curve suggests that tax exemptions can make plastic pans affordable for up to 2 million additional households (see Figure 12). The boost in demand, far in excess of the breakeven

**Figure 12: Additional households (million) that can afford plastic pans due to exemption(s)**



quantity, can provide manufacturers with proof of the market’s potential if the policy is accompanied by broader market development efforts to translate this demand to actual purchases.

Domestic manufacturers also face a range of other barriers to starting and profitably operating a business of manufacturing plastic pans:

- **Lack of clarity on mechanisms to access technology:** Manufacturers stated needs include access to imported molds and other technology to be able to manufacture plastic sanitation products. However, a foreign technology provider we interviewed was reluctant to provide molds to third-party domestic manufacturers because mechanisms to remit royalties or licensing fees from Ethiopia were unclear.
- **Time required to set up production:** Manufacturers stated that setting up a greenfield facility is time-consuming because government approvals for industrial land can take up to several months. The delays increase investment costs and the timely introduction of products. These manufacturers preferred expedited access to industrial parks, where some infrastructure is already present, and the time to set up is reduced.

Manufacturers also highlighted the **lack of access to foreign exchange** as a barrier to profitably running the business. Plastic product manufacturers require plastic pellets, which are a key raw material and need to be imported. However, the lack of access to foreign exchange is a macro-level challenge in Ethiopia, and all manufacturers were concerned that it would make the venture unprofitable.

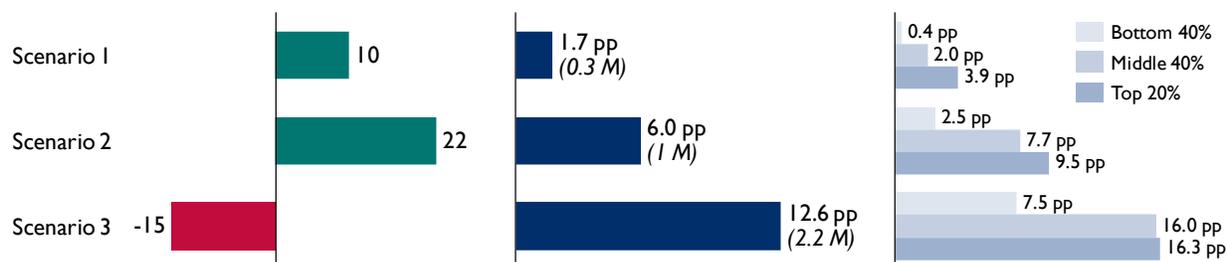
Our recommendations include policies based on global precedents to incentivize domestic manufacturing that can help Ethiopian manufacturers overcome these challenges.

### 6.3 FINDING 3: COSTS & BENEFITS

Our analysis highlights that the costs of implementing the policy are significantly outweighed by its economic benefits.

The main economic cost of the policy is the tax/tariff revenue that the government will forego due to tax exemptions. Our conversations with GoE stakeholders indicate that the administrative costs to implement the policy are not significant because it is primarily a one-time revision of the tax/tariff codes. The private sector refers to the prevalent tax/tariff rates for invoicing, while the Ministry of Revenue uses it for tax assessments. Thus the fiscal policy does not have recurring implementation costs. We estimate that the foregone revenue could be as high as ETB 14.6 million in scenario 3 (see Figure 13) if the additional demand generated by the exemptions is fulfilled with purchases. Further, this cost is not an upfront monetary outflow; instead, it is incurred only when a sale is made and the GoE foregoes tax revenue it would have earned otherwise.

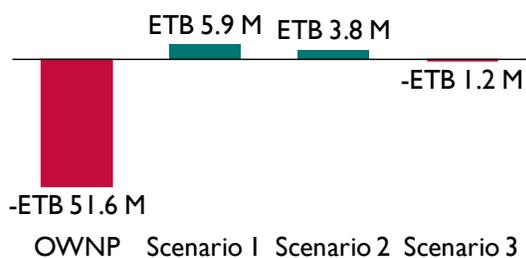
**Figure 13: Scenario-wise change in government revenue (ETB M), change in rural improved sanitation coverage overall (percentage points and number of rural households in million), and change in rural sanitation coverage by income segment (percentage points)**



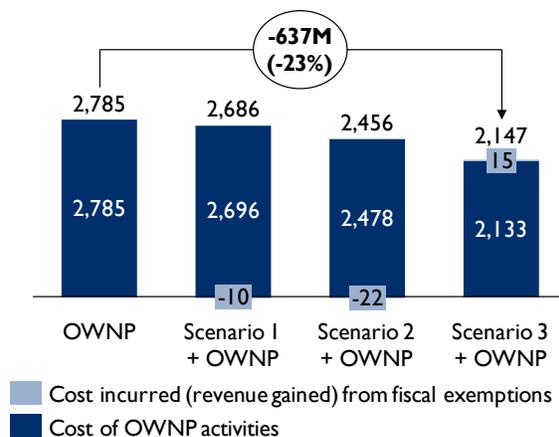
In scenarios 1 and 2, the government gains revenue instead of forgoing revenue owing to improved affordability and are *prima facie* attractive options. However, the corresponding increase in improved sanitation coverage is modest in both absolute and percentage terms, and the benefits are cornered by the top 20% and middle 40% of rural households by income primarily. Moreover, scenario 2, involving customs duty and surtax exemptions, benefits foreign manufacturers and importers while domestic manufacturers are at a disadvantage because they incur VAT.

Scenario 3, with the highest increase in rural sanitation coverage, is also significant because the key economic benefit of the policy is the potential savings for the OWP in the form of “cost avoidance.” Tax exemptions are more cost-efficient than OWP activities to increase improved sanitation coverage. As Figure 14 highlights, OWP activities cost an estimated ETB 52 million per pp increase in coverage. In contrast, even full tax exemptions (scenario 3) costs a fraction, at ETB 1.2 million on a per pp basis. The cost savings (or cost avoidance) for the OWP are realized when each household that gains access to improved sanitation through tax exemptions reduces the number of households that the OWP needs to target (and spend on). OWP funds can be used instead to target only unserved households that do not benefit from tax exemptions.

**Figure 14: Revenue gained or cost incurred (ETB M) per pp increase in rural improved sanitation coverage in each scenario**



**Figure 15: Total cost (ETB M) to achieve 54pp increase in rural improved sanitation coverage for each scenario**



Note: pp: percentage point

Further, the overall cost reduces significantly because the cost per household of full exemptions is lower than the estimated OWP cost. In other words, each percentage point increase in improved sanitation coverage at the cost of ETB 1.2 million (Scenario 3) leads to a cost avoidance of ETB 52 million in the OWP spend. Hence, the total cost of ETB 2.8 billion<sup>6</sup> estimated by the OWP for achieving the target of a 54pp increase in coverage can reduce by as much as ETB 637 million (23 percent) if OWP activities are implemented in conjunction with tax exemptions (see Figure 15). Conversely, despite scenarios 1 and 2 leading to tax revenue gains, the modest increases in improved sanitation coverage imply OWP has to target more households at a higher cost than scenario 3. Therefore, in scenarios 1 and 2, the total cost of achieving OWP’s target reduces by 4 and 12 percent, respectively, compared to 23 percent in scenario 3.

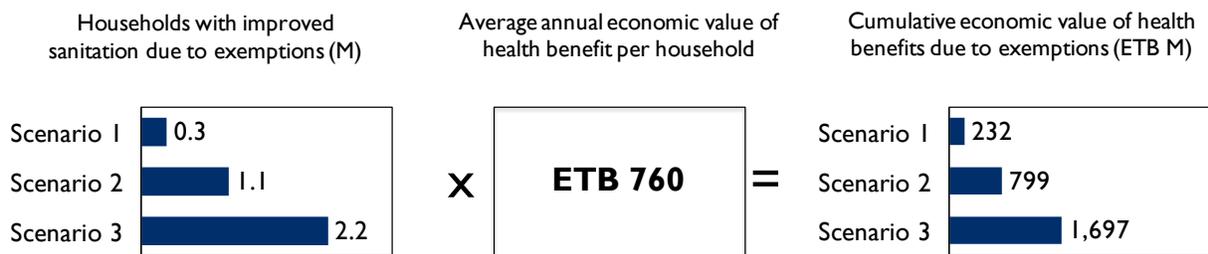
The second economic benefit of the policy is the economic value of the potential health benefits that can be generated by providing households with access to improved sanitation facilities. Our adaptation of the WSP’s ESI methodology estimated a value of ETB 760 as the average annual health benefit of

<sup>6</sup> Taken as the cost estimated by the OWP to take villages to primary ODF status.

improved sanitation per household. This represents the economic value of reducing premature mortality, health care costs, and productivity losses (through absenteeism) caused due to diarrhea alone, with the reduction driven by access to improved sanitation facilities. Extrapolating this value to the number of households that can gain improved coverage due to exemptions suggests that the health benefits of tax exemptions can be as high as ETB 1.7 billion (see Figure 16).

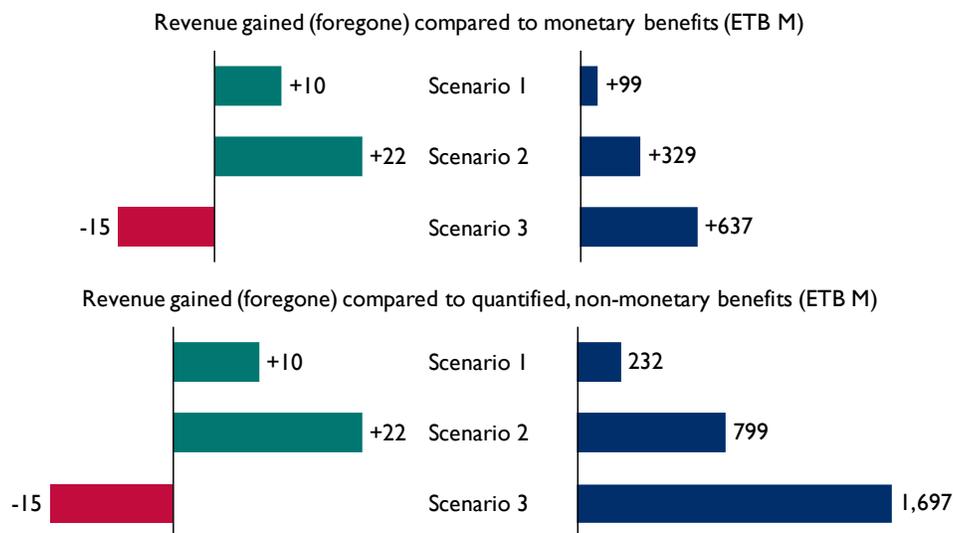
While we have strived to generate a conservative estimate of health benefits, other approaches may arrive at different (and perhaps lower) values. However, even if the quantified economic value of health benefits is one-tenth or one-hundredth of our estimate, it outweighs the costs of the policy. The *Adaptation of the ESI methodology* section of the *Technical Supplement* provides further details.

**Figure 16: Calculation of health benefits of tax exemption**



Overall, our analysis suggests that full tax exemptions will generate monetary benefits (OWNP cost savings) and non-monetary benefits (i.e., improved health benefits) that will be significantly greater than the tax revenue foregone by the government (see Figure 17).

**Figure 17: Economic benefits and costs (ETB M) of implementing the tax exemption policy**



*Note: Revenue gained (foregone) charts to the left are not at the same scale as the economic benefits charts to the right*

## 7.0 RECOMMENDATIONS

Our recommendations for implementing a policy of tax exemptions are based on two key principles:

- Complementary policy interventions such as market development efforts and targeted subsidies will be needed alongside tax exemptions
- Tax exemptions cannot be granted in perpetuity and will need sunset clauses to align with the GoE's goal to promote domestic manufacturing

In general, any market-based sanitation strategy will need several interventions across the policy and private sector domains, working in tandem to scale sanitation markets.

We recommend that the GoE implement a three-phase strategy to achieve its goals:

- **Seed the market** for plastic sanitation products
- **Localize the market** with import substitution
- **Reach the poorest** after the market has matured

### 7.1 PHASE I: SEED THE MARKET

The objective of Phase I is to drive the adoption of plastic sanitation products, thus increasing awareness among households and incentivizing domestic manufacturers to enter the market.

Fiscal policy of **full exemptions on customs duty, surtax, and VAT** can serve as a stimulus for the market, lowering prices and boosting demand and sales. Higher sales can increase demand further as customers' purchases lead to a *demonstration effect*, i.e., potential customers are influenced by observing neighbors' and relatives' sanitation facilities to purchase the product themselves. The fulfillment of this increased demand will require **the private sector and NGOs to continue expanding distribution and marketing channels**. For instance, the USAID Transform WASH program continues to actively recruit regional distributors and retailers, among others, to market and distribute plastic sanitation products in the largest regions of Ethiopia (Achenbach, 2020).

Precedents or analogs of tax exemptions to grow markets include a) off-grid solar products markets in Kenya, Rwanda, Tanzania, and Uganda, which together account for 25 percent of the global market (GOGLA, 2019); b) sanitary pads in Kenya with VAT exemption in 2004 followed by import duty exemption in 2011 that witnessed the entry of small-scale domestic manufacturers and product innovations (FSG, 2016; UKAID, 2020).

As the market develops and sales increase, domestic manufacturers will be incentivized to enter the market. They will need support, however, to address key barriers that prevent entry, such as access to the relevant technology and the time required to set up production facilities. The GoE can facilitate access to technology through two mechanisms:

- **Provide guidance on royalty mechanisms:** Technology providers need robust royalty mechanisms to ensure that they receive fees for sharing the technology. While royalty mechanisms appear to exist in Ethiopia (Government of Ethiopia, 2016), practical guidance on utilizing the royalty mechanism can facilitate access to foreign technology and/or equipment.
- **Permit an investment allowance for licensing imported technology:** Investment allowance is a tax-benefit mechanism, typically leveraged by existing businesses, in exchange for investments that align with the government's goals (e.g., import-substitution, the supply of socially beneficial

products). Permitting businesses to effectively lower their income tax liability over several years, by accelerating the depreciation of equipment or amortization of license fees, reduces their net investment and enhances returns. These benefits incentivize them to make the necessary upfront investments in equipment and technology for local manufacturing of plastic sanitation products.

The time taken to set up production can be lowered by enabling **fast-track access to land or industrial parks**. The GoE can fast-track all approvals for land or industrial parks going towards the production of socially beneficial products (such as plastic sanitation products) or contribute to Ethiopia's import-substitution goals.

While we cannot prescribe a specific duration for Phase 1, we believe that it will take at least 3 years for imported products to create a demonstration effect for both customers and domestic suppliers. A key milestone to trigger the next phase could be at least two to three manufacturers that have sufficient confidence in the market and are willing to invest in it.

## 7.2 PHASE 2: LOCALIZE THE MARKET

The objective of Phase 2 will be to accelerate and sustain import substitution by incentivizing locally manufactured products.

In this phase, sunset clauses on customs duty and surtax exemptions can be triggered because they would have served the purpose of stimulating the market, particularly the entry of domestic manufacturing companies. **Exemptions on VAT** can continue as they are likely to make the local products more affordable (or at least competitive) compared to imported goods.

The GoE should continue addressing barriers to investment to attract more players (as highlighted in Phase 1), but also start addressing operational barriers, such as the high cost of raw materials, that can hamper domestic manufacturers.

We recommend offering **tax-credits to domestic manufacturers to offset the customs duty and VAT paid on imported plastic pellets and other locally unavailable raw materials consumed to manufacture sanitation products**. Raw materials can constitute up to 50-70 percent of the cost of production of plastic sanitation products,<sup>7</sup> and a key driver of raw material costs is the difficulty in accessing foreign exchange. However, this is a challenge for all industries, and critical sectors (such as oil and defense) justifiably get higher priority to foreign exchange. Limited foreign exchange could prompt domestic manufacturers to prioritize importing raw materials for their primary, non-sanitation-related business instead of manufacturing plastic sanitation products. While the availability of foreign exchange will likely remain a challenge, tax-credits on raw materials can provide some relief and ensure that manufacturers devote a share of raw materials to manufacturing sanitation products. Manufacturers can claim the taxes/tariffs paid on raw materials (such as plastic pellets) as credits in proportion to the number of sanitation products manufactured by them. These credits can offset future raw material purchases or tax liability, which could offer a competitive advantage in procurement over other plastic manufacturers that do not manufacture sanitation products. The government can leverage existing tax accounting and reporting mechanisms to facilitate fiscal relief.

In addition to these fiscal policies, the GoE should continue engaging with NGO and private sector players to further develop the market by advancing distribution networks.

The GoE can trigger Phase 3 when there are more manufacturers active in the market and improved rural sanitation coverage has reached a certain minimum threshold in several regions. For instance, this threshold could be 80 percent, under the premise that those who can afford unsubsidized products have already made their purchase and the balance primarily comprises of the 18 percent of rural households

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<sup>7</sup> Based on interviews with domestic manufacturers.

who need support, i.e., households who do not have toilets and belong to the “bottom 40%” income segment (see Figure 10).

### 7.3 PHASE 3: REACH THE POOREST

With an established market of locally manufactured products and increasing basic sanitation coverage, Phase 3’s objective will be to reach the poorest households, who cannot be served by markets alone.

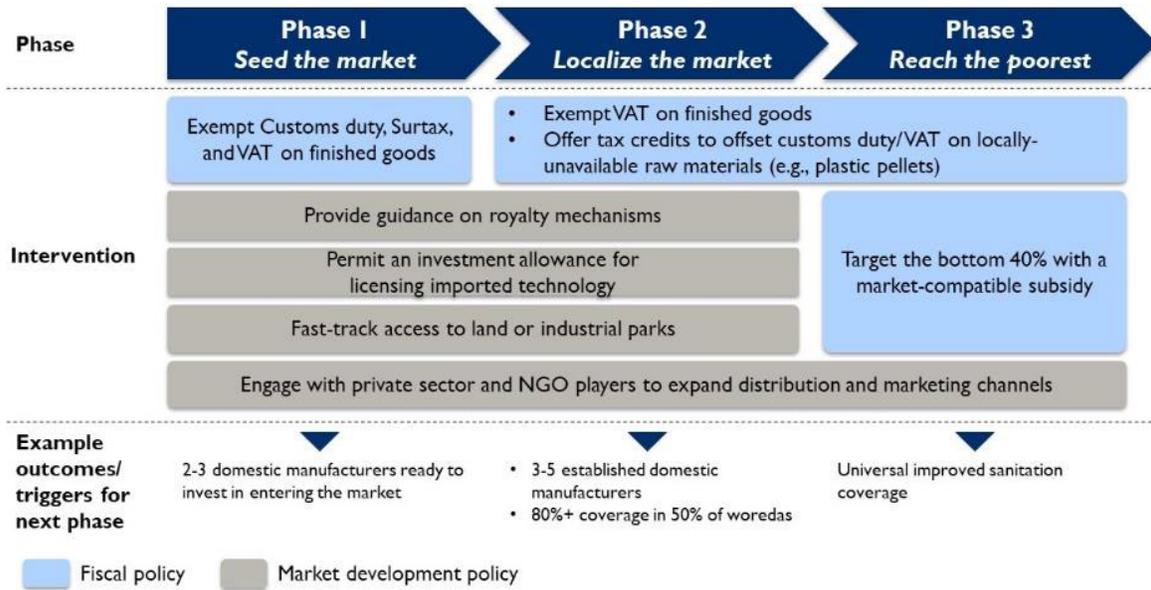
We suggest providing **market-compatible, targeted subsidies** that minimize market distortions and primarily benefit those in genuine need of assistance. The GoE can provide such subsidies based on the following example guidelines:

- **Area-coverage threshold:** Ideally, the subsidy should only be provided to households that belong to the poorest income segments. However, in the absence of existing poverty identification mechanisms (e.g., *IDPoor* system in Cambodia, *Below Poverty Line* cards in India), setting up new identification and verification systems can be challenging and expensive propositions. Therefore, we recommend an alternative mechanism to introduce subsidies in a market (e.g., *woreda*-level) only when it has reached a threshold of improved coverage defined by the GoE. For instance, the government can set the threshold at 80 percent. Introducing subsidies in this manner improves the likelihood that they reach those in need. By contrast, introducing a subsidy too early (i.e., low improved sanitation coverage) will benefit those who can afford market prices.
- **Leverage market-based supply:** The GoE can provide discount vouchers for product options that exist in the market and are redeemable at participating sanitation enterprises. This mechanism benefits existing sanitation enterprises with sales to a large segment of unserved households, allows beneficiaries to exercise product choice, and could improve economies of scale for existing products on offer.

Similar subsidy designs have been successful in Cambodia to increase coverage among the poorest households without distorting the market (iDE, 2019). The above guidelines discuss the form, timing, and channeling of subsidies. The World Bank’s six-country comparative review and analysis for financing onsite sanitation for the poor discusses subsidy design in more detail (Trémolet, et al., 2010).

Along with subsidies, the GoE should continue to offer fiscal benefits, such as VAT exemption, to domestic manufacturers (as specified in Phase 2), and continue engagement with the private sector and NGO actors, who will be critical for the successful implementation of the subsidy. Phase 3 can continue until GoE achieves its target for universal improved sanitation coverage.

**Figure 18: Summary of the 3-phase strategy**



## 8.0 LIMITATIONS

The impact assessment is based on a few critical assumptions. We made these assumptions to ensure we fulfilled our scope of providing a long-term view of the impact of the policy while managing data limitations.

Overall, our key recommendation to implement a policy of tax exemption holds even if some of the assumptions alter. Our view is based on the premise that any degree of price reduction due to tax exemptions will increase demand, however small, leading to cost savings for the OWNP and health benefits. This is because tax exemptions are more cost-efficient, as explained in *Finding 3: Costs & benefits* section.

Below, we highlight our key assumptions, our approach to validating them (where possible), the limitations of the assumptions, and possible mitigations.

Assumption	Approach to validate the assumption	Limitation	Mitigation
The price analysis assumes that value chain players will pass on 100 percent of the benefits of tax exemptions to consumers in the form of lower prices.	We have tested this assumption with 9 value chain players, all of whom claimed that they would reduce prices if taxes and tariffs are removed.	Our recommendation to implement the policy will remain valid if value chain players pass through less than 100 percent of the benefits to consumers. Any reduction in price (however small) will improve affordability, leading to an increase in coverage and costs savings.	The GoE can ensure this assumption plays out by leveraging centralized mechanisms to monitor the prices of tax/tariff-exempt products.
The demand curve is synthetic and assumes that households will spend a certain proportion of their household expenditure on purchasing a plastic pan. These “thresholds” are assumed to be the same as those from a willingness-to-pay study done in Kenya.	We have verified our demand curve using an alternate approach and by comparing the results to limited price experiments in Ethiopia. The <i>Derivation of Synthetic Demand Curves</i> section in the <i>Technical Supplement</i> provides details.	Our recommendation to implement the policy remains valid if the demand is less sensitive than depicted in our synthetic demand curves. Any increase in demand (however small) will lead to an increase in coverage and cost savings (as explained above).	We plan to conduct an auction study in Ethiopia when COVID-19 travel restrictions are lifted to generate primary demand data and further refine our analysis. Further, primary data from Ethiopia will serve as a public good and inform other interventions such as the amount of subsidy required in Phase 3.
Estimates of sanitation coverage assume that the market for plastic sanitation products will gradually mature through increasing awareness and	We cannot test this assumption as it is a prediction of future market conditions. However, we have included market development efforts in our recommendations to ensure	Without a mature market for plastic sanitation products, which is required for accessibility, the GoE will not be able to achieve its goals of	Market development of affordable sanitation products will need to be a critical component of any policy aiming to achieve an increase in improved sanitation

Assumption	Approach to validate the assumption	Limitation	Mitigation
penetration of supply chains for these products throughout rural Ethiopia.	the assumption is realized in the future.	increasing sanitation coverage or boosting domestic manufacturing.	coverage and is not just limited to the specific policy discussed in this document.
Estimates of OWNPs cost savings assume that the OWNPs costs comprise only of variable costs and do not vary by level of coverage increase.	We are unable to validate this assumption because a breakdown of the OWNPs costs into fixed and variable components is not available in the public domain.	Our recommendation to implement the policy will remain valid unless the OWNPs cost consists primarily of fixed costs.	We can refine the analysis if/when a breakdown of the costs is made available.

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