

COUNTING THE COST OF PLASTIC POLLUTION IN EGYPT, MOROCCO & TUNISIA

WHAT INACTION COSTS, AND WHAT ACTING NOW WOULD RETURN



EXECUTIVE SUMMARY

PLASTIC POLLUTION ON THE SOUTHERN SHORE OF THE MEDITERRANEAN

Across Egypt, Morocco and Tunisia, plastic pollution has become one of the defining environmental and economic pressures of the decade, and its consequences reach well beyond littered beaches into municipal budgets, coastal livelihoods and public health. The 3 countries share a sea that receives an estimated 229,000 tonnes of plastic every year and already holds more than a million tonnes on its seabed (Boucher and Billard, 2020). They sit in a region that generates more than 155 million tonnes of waste a year, 2 thirds of it mismanaged, and that is projected to nearly double that volume by 2050 (World Bank, 2026b). And they share a position in the global plastics economy as net importers of the material they are then expected to manage, with Africa having imported some 117.6 million tonnes of polymers and plastic products between 1990 and 2017, Egypt and Morocco accounting for more than a quarter of that between them (Babayemi et al., 2019).

Every year, plastic pollution takes money out of these 3 economies, and almost none of it shows up in a budget line. This report puts a figure on it. It asks 3 questions. What does plastic pollution cost each country each year if nothing changes? What do the 3 countries get back from the plastic they produce, import and use, in jobs, revenue and value added? And what would each gain by reducing plastic and managing its waste better? The answers are stated with their sources and as ranges, and the method is in the Annex.

The report is written for a decision that has not yet been taken. In 2022 the United Nations Environment Assembly mandated the negotiation of a legally binding international instrument on plastic pollution covering the full lifecycle of plastic, from production and design to disposal (UNEA, 2022). Whether that instrument, referred to in this report as the global plastics treaty, will address how much plastic is produced, and not only how it is managed as waste, is the question that divides the negotiations. The evidence assembled here bears directly on it. For Egypt, Morocco and Tunisia, a strong treaty that reduces plastic production would not harm their economies. **For 2 of the 3 it would lower a cost they carry today without touching the industry they have, and for all 3 it would open the financing that their waste systems need.**

WHAT THE EVIDENCE SHOWS

Plastic pollution is costing the 3 countries between US\$1.7 billion and US\$5.5 billion a year, a figure reached by applying published estimates of the damage each tonne of plastic does in the sea (Beaumont et al., 2019; World Bank, 2023a; 2024a) to the tonnes of plastic each country lets into it (Boucher and Billard, 2020; World Bank, 2024a; 2024b). That figure covers damage to the Mediterranean alone: Egypt's Red Sea coast and Morocco's Atlantic coast are not counted. Marine damage means the loss of value from the sea itself, the services a healthy sea provides, priced per tonne of plastic entering it (Beaumont et al., 2019). The estimates cover the Mediterranean because it is the only sea for which plastic leakage has been modelled on the same basis for all 3 countries, and because it is where these economies live: 85% of Tunisians and 65% of Moroccans live within 100 km of the coast, and most of Egypt's tourism and fisheries sit on it (World Bank, 2022a; 2022b; 2024a; 2024b).

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The figure does not include the direct costs to tourism, fisheries, shipping or human health. The figure counts no hospital admission, no lost fishing day and no unpaid municipal invoice, and every assumption used to build it was chosen to keep the estimate low rather than high. The sectors left out are not small. Coastal tourism is about 95% of Tunisia's tourism output (World Bank, 2024b), coastal areas produce 59% of Morocco's GDP (World Bank, 2022a) and Egypt's fisheries and aquaculture are worth about US\$3.7 billion (World Bank, 2022b). Any share of that lost to plastic sits on top of the figures here. Left on its current path, the flow of plastic into the Mediterranean doubles by 2040 (Boucher and Billard, 2020), and the cumulative cost to the 3 countries of delay reaches US\$30 billion to US\$98 billion. Roughly a quarter of that damage can be avoided through better waste management alone, at a transition cost of similar size (Boucher and Billard, 2020; World Bank, 2026a), and reduction measures lower the cost to the 3 countries further.



US\$1.7 BILLION TO US\$5.5 BILLION A YEAR

WHAT PLASTIC POLLUTION COSTS THE 3 COUNTRIES TODAY, COUNTING MARINE DAMAGE IN THE MEDITERRANEAN ONLY, WITH THE RED SEA AND ATLANTIC COASTS EXCLUDED.



US\$30 BILLION TO US\$98 BILLION:

THE CUMULATIVE COST TO THE 3 COUNTRIES OF DOING NOTHING BETWEEN NOW AND 2040, AS LEAKAGE DOUBLES.



25% OF THAT DAMAGE CAN BE AVOIDED AT A TRANSITION COST OF SIMILAR SIZE

AND THE SAME SPENDING BUYS CLEANER AIR, LESS FLOODING AND LOWER CLEAN-UP BILLS
THAT ARE NOT COUNTED IN THE RETURN.

Sources: Beaumont et al. (2019); World Bank (2023a; 2024a; 2024b; 2026a); Boucher and Billard (2020); Annex A.3 and A.4.

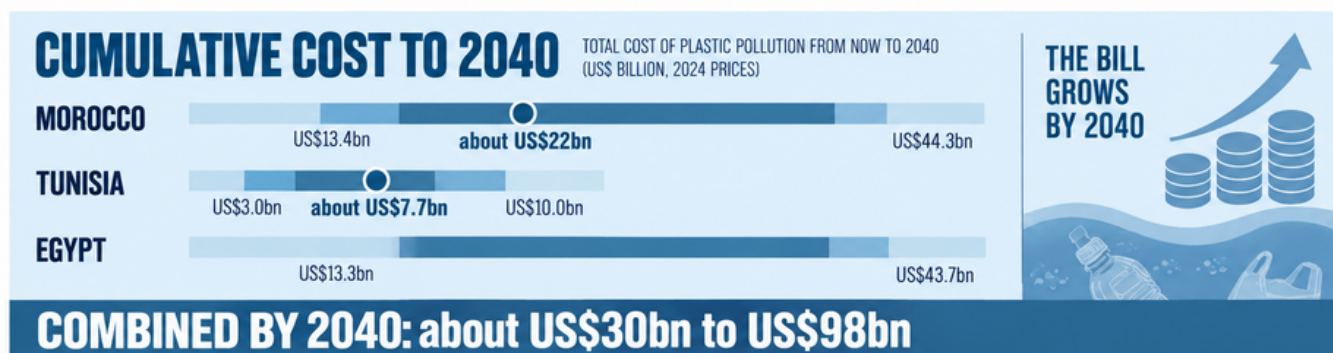
THE ANALYSIS RESTS ON FOUR FINDINGS:

The cost is large, it is rising, and it is being paid now. Morocco carries about US\$1.2 billion a year, or 0.8% of GDP (World Bank, 2024a). Tunisia carries about US\$0.4 billion and Egypt between US\$0.74 billion and US\$3.1 billion (Beaumont et al., 2019; World Bank, 2023a; Table 1). These costs are being paid now, mostly by public budgets. In Tunisia the state's environmental tax funds about 80% of household waste transfer and landfill, municipalities fund the rest, and local revenues cover only about 17.5% of municipal waste costs (World Bank, 2024b). In a sample of Moroccan cities, waste services already absorb 34% of the recurrent budget and about US\$126 million of contractor bills were unpaid at the end of 2020 (World Bank, 2024c). Egypt does not publish a comparable split, and no country publishes a household share.

The cost is spread across public budgets, coastal communities, households and the health system, while the benefit is concentrated in a small number of companies, and in 2 of the 3 countries the part of the industry that a production measure would reach does not exist. The companies are Egyptian petrochemical and conversion firms, and Moroccan converters whose imported inputs mean much of the value flows to foreign polymer suppliers. Tunisia converts plastic but produces none of the raw material (World Bank, 2022a; 2024b), so global measures to reduce plastic production do not touch the industry it has. Plastic packaging and products will continue to be used and sold in all 3 countries under any of the pathways in this report; what changes is how much virgin plastic is produced, how packaging is designed, and who pays for its recovery. Morocco imports 70% of its plastic inputs and exports 9% of its output (World Bank, 2024a). For both, reducing plastic replaces imports rather than displacing industry. Egypt has a substantial petrochemical sector (International Trade Administration, 2025), and Egypt's largest and most immediate gains lie in national action that no treaty position affects.

Most of the solution is practical, already designed and does not wait on the hardest decisions. 2 thirds of the plastic entering the Mediterranean starts inland and is carried to the coast by rivers and run-off (Boucher and Billard, 2020). The measures that follow from that finding are concrete: extending collection to rural communities, commissioning sorting centres that are already built but not yet running, repricing Tunisia's packaging recovery system, which already exists but runs at a fraction of its capacity, and widening producer responsibility beyond plastic bags so that those who place packaging on the market pay for its recovery.

Acting pays for itself even before the biggest benefits are counted. Better waste management alone would avoid about a quarter of the marine damage. The value of that avoided damage is roughly the same as what it would cost each country to collect and safely dispose of all its municipal waste (Boucher and Billard, 2020; World Bank, 2026a; Table 4). That universal collection, meaning every household, urban and rural, has its waste collected and disposed of in a controlled site rather than dumped or burned, also cuts respiratory disease, flooding and municipal clean-up, and none of those savings is included in the US\$1.7 billion to US\$5.5 billion figure. Integrated waste management programmes in Rwanda and the Indian state of Kerala cut waste-related health problems by 30 to 50% within 5 years (Woime, 2026). Rwanda's programme combined a national ban on non-biodegradable plastic with mandatory community clean-ups and cut the incidence of diarrhoea by 47%; Kerala's decentralised collection and household composting diverted 73% of organic waste and reduced mosquito breeding (Woime, 2026). Both went well beyond collection alone, so the 30 to 50% shows what a full package of reduction, collection and community action can deliver.



Economic modelling based on Beaumont et al. (2019), World Bank (2023a; 2024a; 2024b; 2026a) and Boucher and Billard (2020). Marine damage in the Mediterranean only, at 2024 prices. Cumulative costs cover 2026 to 2040, discounted at 3%, allowing for projected leakage growth to 2040. Marine damage only. Health, fisheries, agriculture and informal-worker burdens are not counted in these totals.

PATHWAYS FORWARD

The findings point to a set of measures that are within reach of each government and, taken together, form the basis of a credible programme of national action and a clear ask in the treaty negotiations.

Extend collection where it is weakest. In rural Morocco only about 10% of people have their waste collected; in rural Egypt about 35% (World Bank, 2024a; Faragalla, Kotb and Galal, 2025). Tunisia does not publish a rural figure. The households beyond that reach are the ones living beside open dumping and burning: Egypt sends 80 to 88% of its municipal waste to open dumpsites (Faragalla, Kotb and Galal, 2025), and Morocco mismanages 59.4% of its municipal waste and Tunisia 29.5% (World Bank, 2024a; 2024b). The Egyptian figure is from a national source and the Maghreb figures from the World Bank, so they are comparable in direction but not built on the same method. Those households are where the health and environmental return on investment is greatest.

Finish, and finance, the infrastructure already planned. Morocco has built 9 of 26 planned sorting centres and operates 3 (World Bank, 2024a). Tunisia has 243 approved collection companies and 150 approved recycling units, and 57% of its recycling capacity stands idle because there is no reliable money to run it (World Bank, 2024b). In both countries the constraint is money, not design, which is why the producer responsibility reform that follows comes first.

Make producers pay in proportion to what they place on the market. Recovered material is worth a tenth of what a collection system costs (World Bank, 2024b). Extended producer responsibility, widened from plastic bags to the full packaging stream including tourism and hospitality, is the only financing model that adds up: recovered material is worth about a tenth of what a collection system costs, so the money has to come from the companies that put packaging on the market.

Champion production reduction in the global plastics treaty. For Tunisia and Morocco, a treaty that reduces plastic production lowers a cost they carry and threatens no industry, because neither produces the polymer such a measure would reach. For all 3, the treaty negotiations are also where international finance for waste systems will be agreed. Universal waste collection costs a middle-income country roughly 0.3 to 0.5% of GDP a year, and most spend under 0.15% (World Bank, 2026a). That gap, 0.15 to 0.35% of GDP a year, is the amount the region's governments have asked the treaty's financial mechanism to cover. The treaty mandate provides for financial arrangements (UNEA, 2022) [POLITICAL LEAD: add citation to the INC submission of the African and Arab Groups on a dedicated financial mechanism], and this report puts a number on that gap: roughly 0.15 to 0.35% of GDP a year.

Formalise and fund the transition for the workers who do the recovering. The people who currently recover most of the region's recyclable plastic, the informal collectors and sorters whose work underpins every recycling figure in this report, will still be there after a treaty or a national reform. In Tunisia they recover nearly 80% of recyclable plastic (World Bank, 2024b), and in Egypt 70% of the country's 1,510 recyclers are informal (UNIDO, 2021). The regional blueprints exist: Morocco's 3-phase formalisation roadmap (consultation, transition, implementation, with named responsible entities) and Tunisia's social plan for collectors (World Bank, 2024a; 2024b). Neither has been costed, and Egypt has no equivalent yet. Funding them, and writing an equivalent plan for Egypt, is the difference between a transition that is just and one that is merely announced. Ultimately, the evidence supports a single conclusion. In Tunisia and Morocco, continuing as now costs the 2 countries more than it returns to them, and in Egypt, the country with the largest measured burden in the Mediterranean, the biggest gains come from national measures that can be funded now. In all 3, delay is the most expensive option on the table.

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1. A SHARED SEA, A SHARED RESPONSIBILITY

The Mediterranean is among the most plastic-polluted seas in the world, and the countries on its southern shore are on the receiving end of a problem that begins far upstream, in global production and trade and in rivers that cross a continent.

1.1 THE SCALE OF THE FLOW

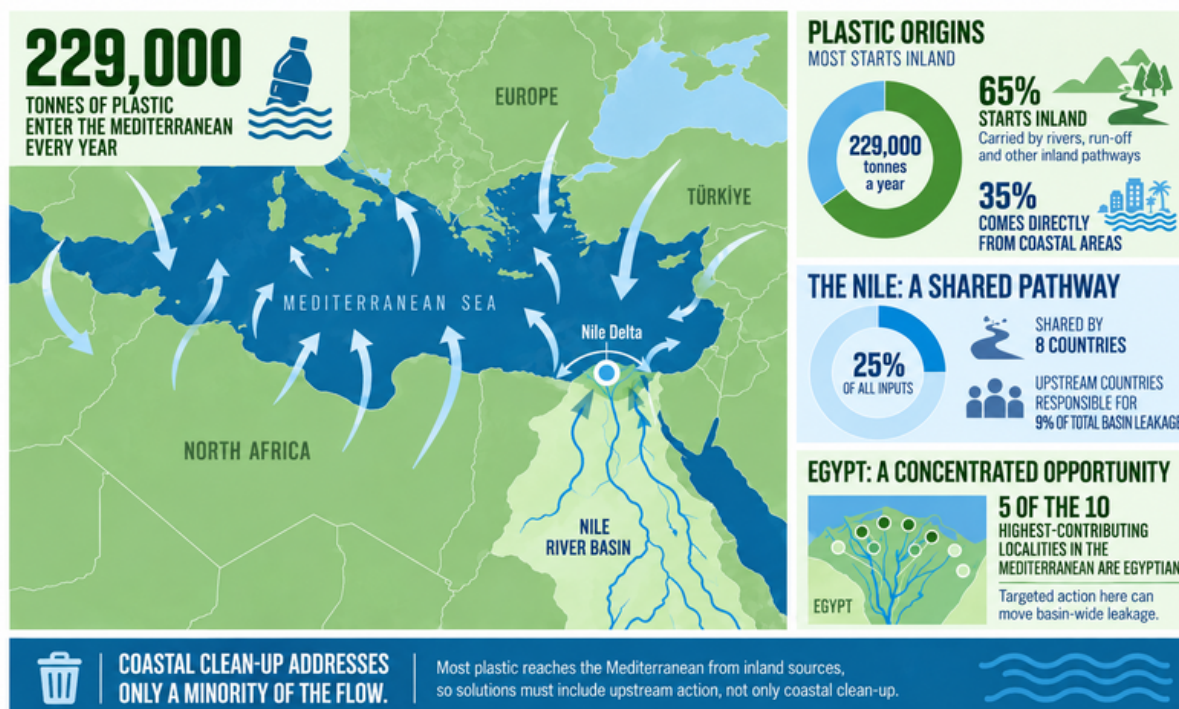
The sea is where these economies live. In Tunisia, 85% of the population lives within 100 km of the coast and coastal tourism is about 95% of the tourism sector (World Bank, 2022a; 2024b). In Morocco, coastal areas produce 59% of GDP and 52% of jobs (World Bank, 2022a; 2024a). In Egypt, coastal tourism is about half of the tourism sector and fisheries and aquaculture worth about US\$3.7 billion employ more than a million people (World Bank, 2022b). The Mediterranean is also the only sea for which plastic leakage has been modelled consistently for all 3 countries, which is why the cost estimates in this report stop at its shore and why they are lower bounds.

An estimated 229,000 tonnes of plastic enters the Mediterranean every year, within a range of 150,000 to 610,000 tonnes, and 94% of it is larger items escaping from mismanaged waste (Boucher and Billard, 2020). What enters the sea does not leave it. More than 1 million tonnes has already settled, the equivalent of 10 years of plastic entering the sea at today's rate, most of it on the seafloor as microplastic that no clean-up can recover (Boucher and Billard, 2020). Plastic that enters the sea stays there, so each year's leakage adds to what is already on the seabed, and each year of delay makes the eventual task larger rather than simply later.

The pressure on the sea reflects the pressure on land. The Middle East and North Africa generates more than 155 million tonnes of waste a year and is heading for 294 million tonnes by 2050 (World Bank, 2026b). About 67% of that waste is mismanaged, meaning it is not collected, or is collected and then dumped, burned or left in uncontrolled sites rather than recycled, composted or placed in a controlled landfill. Under 10% is recycled, reused or composted, and the environmental damage from mismanaged waste across the 19 countries of the Middle East and North Africa, most of which have no Mediterranean coast, is estimated at US\$7.2 billion a year (World Bank, 2026b). That regional figure is built on a different basis from the estimates in this report and cannot be broken down to these 3 countries or to plastic, so it is given as context rather than compared with them. Those figures cover every waste stream across 19 countries; within them, plastic makes up 10.6% of municipal waste in Morocco and 9.4% in Tunisia, and in both countries most of it goes unsorted (World Bank, 2024a; 2024b). Egypt's waste is not reported on the same basis. National estimates put its municipal plastic waste alone at 3.6 to 5.4 million tonnes a year (UNIDO, 2021), roughly 6 to 9 times the Moroccan and Tunisian totals combined.

WHERE THE PLASTIC COMES FROM CHANGES WHERE THE ANSWER LIES

About 65% of the plastic entering the Mediterranean is generated inland and carried to the coast by run-off (Boucher and Billard, 2020). Beach clean-ups, however valuable as a way of making the problem visible, address a minority of the flow. The decisive interventions are upstream: in how much plastic is produced and placed on the market, and in how towns and cities collect and sort what remains.



Source: Boucher and Billard (2020), modelled on 2018 activity.

Basin-wide modelling identifies the 100 localities that contribute most to Mediterranean leakage and finds that bringing them to high-income waste management standards would remove roughly a quarter of the total (Boucher and Billard, 2020). That model tests better waste management and single-use restrictions only. It does not test cutting plastic production, so a quarter is what waste management alone can deliver, not the ceiling for reduction.

1.2 RESPONSIBILITY IS SHARED

Plastic pollution in Egypt, Morocco and Tunisia is embedded in global systems of production, trade and disposal rather than in national behaviour alone. Between 1990 and 2017, Africa imported approximately 117.6 million tonnes of polymers and plastic products. Egypt accounted for 18.4% of that and Morocco 9.6%, and Tunisia ranks sixth on the continent by consumption (Babayemi et al., 2019). All 3 are net importers of the material they are then held responsible for managing once it becomes waste.

The Nile makes the point with precision. Its watershed delivers about a quarter of all plastic entering the Mediterranean, roughly 55,000 tonnes of macroplastic a year, through a pathway shared across 8 countries, with the states upstream of Egypt responsible for 9% of total basin leakage in their own right (Boucher and Billard, 2020). Studies published by the International Union for Conservation of Nature find Egypt to be the largest national contributor of macroplastic to the Mediterranean, at about 74,000 tonnes a year, ahead of Italy and Turkey (Boucher and Billard, 2020). What reaches the sea through the Nile Delta is the product of a river system spanning a continent and a waste system that has not yet caught up with the largest population in the region. The response has to match that scale, and, as Chapter 4 shows, it can.

Imported litter, by contrast, does not explain what is found on the beaches. A field survey of 9 Tunisian beaches at 4 pollution hotspots traced 1,301 items to their origin and found that 98.2% were Tunisian (World Bank, 2024b). The litter is domestic even where the plastic was manufactured abroad, which is a finding to act on: the measures that work are national ones, and they are within reach.

2. WHAT INACTION COSTS

The cost of plastic pollution is not a future risk. It is being paid today, by municipalities that cannot cover their waste bills, by coastal economies whose tourism and fisheries sit in the path of the flow, and by families living beside open dumps. This chapter puts numbers to it.

2.1 THE ANNUAL BILL

COUNTRY	ANNUAL COST	BASIS
Morocco	About US\$1.2 billion, within US\$0.75 billion to US\$2.5 billion. About 0.8% of GDP	A published World Bank estimate and two independent methods converge on the same range
Tunisia	About US\$0.4 billion, within US\$0.17 billion to US\$0.56 billion	Two independent methods converge. The central value is a second method landing inside the first
Egypt	US\$0.74 billion to US\$3.1 billion	Two methods, each capturing a different part of the damage. The lower figure is a floor: Red Sea leakage is excluded
Combined	US\$1.7 billion to US\$5.5 billion	Sum of the three ranges

Table 1. Estimated annual cost of plastic pollution, US dollars at 2024 prices, marine damage only. Sources: Beaumont et al. (2019); World Bank (2023a; 2024a); leakage from Boucher and Billard (2020) and World Bank (2024a; 2024b).

2.2 THE COST OF DELAY

COUNTRY	CUMULATIVE COST TO 2040	CENTRAL ESTIMATE
Morocco	US\$13.4 billion to US\$44.3 billion	About US\$22 billion
Tunisia	US\$3.0 billion to US\$10.0 billion	About US\$7.7 billion
Egypt	US\$13.3 billion to US\$43.7 billion	Within the range
Combined	About US\$30 billion to US\$98 billion	

Table 2. Cumulative cost of delay, 2026 to 2040, US dollars at 2024 prices, 3% discount rate, allowing for the projected doubling of Mediterranean leakage (Boucher and Billard, 2020).

Without intervention, annual leakage into the Mediterranean doubles to more than 500,000 tonnes by 2040. Simply holding it at 2018 levels, it would require reducing mismanaged waste across the basin by 1.7% every year (Boucher and Billard, 2020). Standing still, in other words, requires continuous improvement. Doing nothing is not standing still. It is falling behind at an accelerating rate, with the bill compounding year on year.

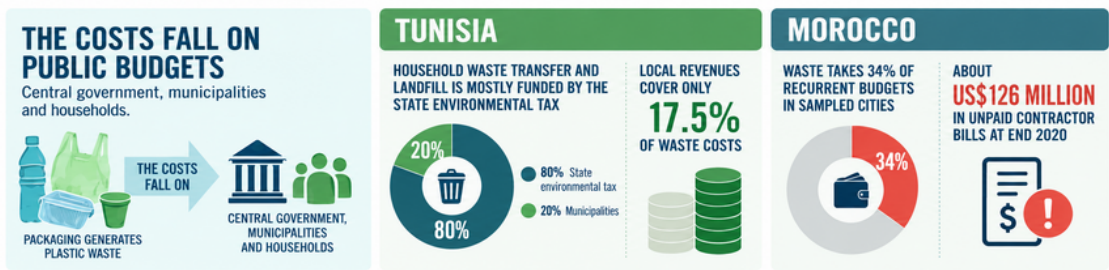
2.3 WHO PAYS THE PRICE

The cost of plastic waste has been moved off the balance sheet of those who generate it and onto public budgets that were never designed to carry it. Tunisia's finances show the mechanism exactly (World Bank, 2024b). About 80% of the cost of transferring and landfilling household waste is met from the state's environmental protection tax and 20% by municipalities (World Bank, 2024b). Collection is a separate and larger bill that municipalities carry themselves, and because local tax collection averages only 12%, the revenue municipalities raise locally covers about 17.5% of their total waste costs (World Bank, 2024b). The balance is met by transfers from central government, principally allocations of the environmental protection tax, and by bills that go unpaid: the system is centrally financed in practice, whatever the formal municipal responsibility (World Bank, 2024b). The tax is levied on importers and manufacturers as a percentage of the value of certain imported goods, and it carries no link to what any individual company places on the market. The firm that sells the most packaging does not pay the most. The firm that redesigns its packaging saves nothing. So the cost of disposal falls on the central budget and on municipalities, and the municipalities cannot afford it.

Morocco shows what that cost looks like from inside a city budget. In a sample of urban municipalities, waste services absorbed 34% of recurrent budgets and 28% of total budgets, and arrears to waste contractors stood at about US\$126 million at the end of 2020 (World Bank, 2024c). Waste is already taking a third of the recurrent budget in the cities sampled, and the bills are not being paid. This is not a future cost of environmental ambition. It is a present cost of the current system, carried by the level of government closest to the people who live with it.

These waste system costs are a different measure from the marine damage estimates in Tables 1 and 2 and are not added to them. The budget figures show what governments already pay to run waste systems that are underfunded; the marine estimates value what the plastic those systems fail to capture then destroys in the sea. The budget cost is the smaller of the 2, and it is already unaffordable. The total cost society pays runs through the ecosystems that sustain coastal livelihoods and the national economy, and it is the larger figure in this report.

In Tunisia, municipalities recover about 17.5% of their waste costs locally. In a sample of Moroccan cities, waste takes 34% of the recurrent budget and about US\$126 million of contractor bills were unpaid at the end of 2020. The cost of plastic is on the public books already (World Bank, 2024b; 2024c).



Caveat: Moroccan figures cover municipal solid waste overall, not plastics alone. Sources: World Bank (2024b; 2024c).

2.4 WHY RECOVERED MATERIAL CANNOT PAY FOR THE SYSTEM

Tunisia's packaging recovery system was designed on the assumption that the resale value of recovered material could finance collection (World Bank, 2024b). The Tunisian evidence shows why it cannot, for plastics at least. Tunisia mismanages about 55,500 tonnes of plastic a year (World Bank, 2024b).

Valued at the price recyclers actually pay for PET bottle plastic, all of it is worth at most about TD 13.9 million (about US\$4.4 million) a year, and actual plastic sales through the national packaging recovery system were TD 1.2 million in 2021 and TD 1.3 million in 2022 (World Bank, 2024b). The entire recoverable value of a country's mismanaged plastic is far too little to finance its collection and recycling. A recovery scheme that relies on selling the material to pay for itself will run out of money. Tunisia's did (Chapter 6). Extended producer responsibility, in which those who place packaging on the market fund its recovery in proportion, is not one policy option among several. It is the only financing model that the arithmetic supports.

How extended producer responsibility works

Companies that place packaging on the market pay a fee, per tonne or per unit, into a fund that finances collection, sorting and recycling. Fees can be set higher for packaging that is hard to recycle and lower for packaging that is reusable or made from recycled material, so that design decisions carry a price. The fund pays the people who do the collecting, which is how informal collectors can be brought into a formal, paid and protected system.

The region already shows both what works and what fails. Tunisia's environmental protection tax is charged as a percentage of the value of imported goods, with no link to the packaging a company sells, so it raises general revenue and leaves the recovery system rationing what it can afford (World Bank, 2024b). Morocco's plastic bag laws came with a MAD 200 million conversion fund that identified and supported 104 industrial units and 3,840 jobs in the affected subsector (Kingdom of Morocco, Ministry of Industry and Trade, 2017; 2018). A producer responsibility scheme that links the fee to packaging placed on the market and funds the transition for workers combines the 2 lessons.

2.5 HEALTH

Where waste is dumped and burned in the open, the cost of plastic is breathed in. The World Health Organization identifies open burning of waste as a significant source of air pollution and notes that mixed household waste routinely contains plastics and polystyrene, so that burning it releases pollutants linked to respiratory disease, coughing and skin irritation (World Health Organization, 2025a; 2025b). A systematic review of 78 studies in low and middle income countries finds that living near unmanaged waste carries about 3 times the risk of diarrhoeal disease, 2.8 times the risk of acute respiratory infection, 2.1 times the risk of skin conditions and a 2.7-fold rise in dengue (Woime, 2026).

Across the 3 countries, the ranking of respiratory disease matches the ranking of waste mismanagement. Egypt sends 80 to 88% of its municipal waste to open dumpsites (Faragalla, Kotb and Galal, 2025) and records the highest incidence of lower respiratory infection of the 21 countries in the Middle East and North Africa, at 8,151 cases per 100,000 people, about 29% above the global average and far above what its level of development would predict (Ashrafi-Asgarabad et al., 2023). Morocco mismanages 59.4% of its municipal waste and Tunisia 29.5% (World Bank, 2024a; 2024b), and Tunisia carries the lightest respiratory burden of the 3 (Ashrafi-Asgarabad et al., 2023). Income and development normally explain most of the difference in respiratory disease between countries. In Egypt they do not, and the excess has to be explained by exposures that income does not capture. Open dumping and burning, which the World Health Organization identifies as a significant source of air pollution, are among them. This is an association across 3 countries, not a measured attribution, and the technical analysis treats it as such. It is enough to establish that waste management, on this evidence, is health policy.

The age structure of the 3 countries turns present exposure into future cost. About 1 third of Egyptians are under 15 (UN DESA, 2024), as are 27% of Moroccans (Haut-Commissariat au Plan, 2024) and about a quarter of Tunisians. Children living near open dumping and burning carry the exposure earliest and longest, so that today's mismanaged waste arrives as demand on health systems for decades to come. The return on acting is correspondingly long.

Microplastic is also entering the food chain. Most of the microplastic on Tunisian beaches is formed from larger items breaking down (World Bank, 2024b), and the Mediterranean seabed already holds more than 1 million tonnes of plastic, largely as microplastic in sediment (Boucher and Billard, 2020). The health effects of microplastic ingestion are an emerging area of evidence and are not quantified in this report.

2.6 COASTAL LIVELIHOODS AND THE PEOPLE WHO DO THE WORK

Tourism and fisheries are the largest economic activities standing in the path of coastal plastic, and they employ the communities with the most to lose. In Tunisia, coastal tourism accounts for about 95% of the tourism sector's contribution to GDP and about 90% of tourism accommodation is on the coast (World Bank, 2024b). In Morocco, coastal areas contribute 59% of GDP and 52% of jobs (World Bank, 2022a; 2024a). In Egypt, coastal tourism accounts for about half of the country's tourism, and fisheries and aquaculture worth about US\$3.7 billion provide jobs for more than a million people directly and indirectly (World Bank, 2022b). What is at stake is growth. Tunisia earned TND 6.92 billion in tourism receipts in 2023 and Egypt received about 15.8 million international visitors in 2024 (ONTT, 2024; CAPMAS, 2025); those are the revenues that sit in the path of the flow. On Tunisian beaches, fishing nets and net fragments are the single largest item of litter by weight, at 22.2% (World Bank, 2024b): the sector that suffers from marine plastic pollution is also losing its own gear to it. This report does not assume that a share of these sectors is lost to plastic, because no study has measured that. It records that the sectors on which these economies depend are the ones most exposed, and that every measure in Chapter 7 protects them.

Behind every recycling figure in this report stand the people who currently recover most of the region's recyclable plastic. In Tunisia, the informal sector recovers nearly 80% of it (World Bank, 2024b). In Morocco, women hold a significant share of the work in plastic recycling, concentrated in sorting (World Bank, 2024a). Their contribution is rarely reflected in national planning, yet both Maghreb countries already have a formalisation pathway prepared: Morocco a 3-phase roadmap with named responsible entities, and Tunisia a social plan for collectors identified as an immediate next step (World Bank, 2024a; 2024b). In Egypt, 70% of the country's 1,510 recyclers and 42% of its single-use product manufacturers are informal (UNIDO, 2021), so the informal sector carries most of the recovery there too, without a formalisation plan of the kind the Maghreb countries have drafted. The sector does not disappear under a treaty or a national reform. It becomes documented, safer and better paid, and in 2 of the 3 countries the plans to make that happen are already written.

3. WHAT THE CURRENT SYSTEM RETURNS

The question at the heart of this report is whether the benefits of the current plastics system, meaning the plastic that is produced in or imported into each country, the products and packaging made from it, the jobs and revenue that activity supports, and the waste it leaves behind, outweigh the cost of the pollution it produces. The choice is not between using plastic and not using it. It is how much virgin plastic is produced, how packaging is designed, and who pays for its recovery. Answering it credibly means counting what the system gives back. For each country this report asked who receives the benefit of the current plastics system, whether it stays in the country, whether it is gross revenue or value actually added, and whether it would survive a managed transition. The answers separate the 3 countries sharply.

3.1 TUNISIA: A CONVERTING INDUSTRY, AND NO POLYMER PRODUCTION

Tunisia has a real downstream plastics industry, and it deserves to be counted in full. The national business register records 1,931 enterprises and 23,463 formal employees in the manufacture of rubber and plastic products in 2023, with about 30% of that employment in foreign-owned firms (INS, 2024). Those workers create an estimated US\$280 million to US\$330 million of value added a year, meaning the value the sector creates after paying for its inputs. The estimate applies Tunisia's manufacturing value added per manufacturing worker (World Bank, 2025a; INS, 2023) for the lower bound and GDP per person employed (World Bank, 2025b; INS, 2023) for the upper bound; the Annex sets out the calculation. The modelling therefore shows that everything the plastics industry adds to Tunisia's economy in a year sits inside the range of what plastic pollution costs the country in the same year, US\$170 million to US\$560 million, and in the lower half of it. That is the whole industry, including its foreign-owned third, set against a cost that counts marine damage alone. Put plainly, plastic pollution is likely costing Tunisia as much as its entire plastics industry creates in a year, and on the central estimate of US\$0.4 billion, more.

What Tunisia does not have is production of the plastic itself. The World Bank's technical note on the entire Tunisian plastic value chain records no domestic petrochemical production (World Bank, 2024b), the country's principal plastics tax is an import levy, and projected imports of plastic material of 70,000 tonnes, against 1.2 million tonnes for Morocco, describe a consuming market rather than a producing one (World Bank, 2022a). That distinction settles Tunisia's interest. A treaty measure that caps or reduces virgin polymer production reaches the producers Tunisia buys from, not the converters Tunisia employs. Tunisia carries the cost of plastic and none of the production revenue, and a global reduction in production reduces its cost without removing its industry. A tighter global polymer market could raise input prices for Tunisian converters.

That is a real transition cost, but it falls on every importing country alike, it is reduced as recycled content and reuse replace virgin material, and it is a reason to support converters through the transition rather than a reason to keep paying the cost of pollution.

3.2 MOROCCO: AN INDUSTRY THAT IMPORTS MORE THAN IT EARNS

Morocco's plastics industry serves the domestic market and depends on foreign suppliers for its raw material. Imported polymer accounts for 70% of plastic manufacturing inputs, and exported products account for 9% of production (World Bank, 2024a). A large share of the value in the chain therefore flows to foreign producers of virgin plastic, and the sector does not earn foreign exchange. Any claim that plastics measures threaten Moroccan export competitiveness fails on the sector's own numbers. Reducing plastic use in Morocco replaces imports. It does not displace industry.

The growth opportunities Morocco does have sit on the transition side of the ledger. Circularity in Morocco's textile industry alone has been assessed at about US\$1.9 billion of investment potential and more than 30,000 jobs, driven by tightening European market requirements (IFC, 2023). The markets Morocco sells into are moving, and the national interest lies in moving with them.

3.3 EGYPT: A SUBSTANTIAL INDUSTRY AND A NATIONAL DECISION

Egypt presents a more complex case. Its petrochemical sector is reported at about US\$8.6 billion of revenue in 2024, close to 2% of GDP and about 12% of industrial production, with 4.5 million tonnes of petrochemicals produced in 2024 and about US\$7 billion of further investment planned over 4 years (International Trade Administration, 2025). That figure covers the petrochemical sector as a whole rather than plastics alone, is gross revenue rather than value added, and does not show how much value is retained within the Egyptian economy. Without data on value added, employment and the composition of production, headline sector revenues cannot be treated as evidence that business as usual serves Egypt's broader economic interest. What the evidence establishes is the importance of managing the transition carefully, and, as Chapter 4 shows, that the largest and most immediate gains for Egypt lie in national measures that strengthen its industry's position rather than weaken it.

3.4 CONCENTRATED BENEFIT, DISPERSED COST

Where industrial benefit exists, it is concentrated: in Egypt among a defined set of petrochemical and conversion firms, in Morocco among converters whose input value flows substantially abroad. The costs described in Chapter 2 are dispersed across municipal budgets, coastal economies, households and the health system. Producers and importers place packaging on the market, and the cost of dealing with it afterwards is carried by public budgets, by municipalities that recover a fraction of their waste costs, by households where collection does not reach, and by the sea itself. That asymmetry is the substance of the case, and it is measured rather than asserted.

4. EGYPT: THE LARGEST OPPORTUNITY IN THE BASIN TO CUT PLASTIC LEAKAGE

Egypt sits at the meeting point of 2 seas and depends on both, and its long coastline, densely populated Nile corridor and expanding industrial zones make it the largest consumer and producer of plastic in this study. They also make it the country where targeted action moves the regional total furthest.

4.1 SCALE

Egypt is the largest of the 3 economies and populations, and the scale of its waste system matches. National waste generation across municipal, agricultural and drainage streams is around 100 million tonnes a year. Urban collection reaches about 85% of the population and rural collection about 35%, and 80 to 88% of municipal waste currently ends in open dumpsites (Faragalla, Kotb and Galal, 2025). The plastic value chain is large and largely informal: 8 petrochemical producers with about 2 million tonnes of capacity meeting 24% of raw material demand, with 76% imported; about 50 compounders; about 5,220 single-use product manufacturers, of which 42% are informal; and 1,510 recyclers, of which 70% are informal (UNIDO, 2021). Municipal plastic waste is estimated at 3.6 to 5.4 million tonnes a year (UNIDO, 2021).

The Nile carries the outcome to the sea. Its watershed delivers about a quarter of all plastic entering the Mediterranean through a pathway shared by 8 countries, and Egypt's own contribution is estimated at about 74,000 tonnes of macroplastic a year, modelled on 2018 activity (Boucher and Billard, 2020). 5 of the 10 localities that contribute most to leakage in the entire Mediterranean are Egyptian, led by Muntazah at about 1,900 tonnes a year, with Waraq, Umraniyya, Kafr Al-Dawwar and Al-Husayniya following (Boucher and Billard, 2020). Those 5 localities are the most concentrated opportunity in the basin. Bringing the 100 highest-contributing localities in the Mediterranean to high-income waste standards would remove roughly a quarter of all leakage into the sea, and 5 of them sit within Egypt's reach (Boucher and Billard, 2020). No other country can move the basin total as far with as few interventions.

4.2 THE RETURN FOR EGYPT

The cost of inaction to Egypt is US\$0.74 billion to US\$3.1 billion a year and US\$13.3 billion to US\$43.7 billion to 2040, and that is the marine figure only. Egypt has the largest population of the 3 living near open dumping and burning, and the highest respiratory disease burden in the region, higher than its development level predicts (Ashrafi-Asgarabad et al., 2023). About 1 third of Egyptians are under 15 (UN DESA, 2024). Extending collection to the 65% of rural residents it does not reach, and moving municipal waste out of open dumpsites, is the single largest health, environmental and fiscal measure available to any of the 3 governments, and it lies entirely within national control.

4.3 THE PATHWAYS

Egypt already has the instruments: a waste management law, a national single-use plastics strategy and a producer responsibility measure covering shopping bags. 3 pathways build on them, and each includes the measures of the 1 before it. A low-cost pathway enforces the existing instruments and extends collection in the Nile Delta governorates, where the modelled leakage concentrates.

A managed transition widens producer responsibility from bags to the wider packaging stream, including the hotels, restaurants and tourism operators whose packaging reaches the coast first, so that the cost of recovery is funded by those who place packaging on the market rather than by governorate budgets.

A high-ambition pathway engages virgin polymer production directly, and here Egypt weighs a stated industrial plan against the finding in Chapter 3 that the revenue attached to it is gross, spans petrochemicals as a whole and has not been shown to translate into net national benefit. The evidence in this report points to the high-ambition pathway as the destination, because it is the only one that reduces the volume of plastic Egypt has to manage, and lower volumes lower the cost of every measure in the first 2 (World Bank, 2026a). What the evidence does not yet support is a claim about the net industrial cost, which is why the first 2 pathways are presented as immediate steps and the third as the decision Egypt should take with its own data.

The first 2 pathways do not depend on the third. They reduce a measured burden, they are fundable under the financing mechanisms Egypt has championed in the treaty negotiations, and they position Egypt's recyclers, 70% of whom are informal today, and its converters for a market in which recycled content and design standards are tightening. That is where Egypt's immediate interest lies.

RECAP: EGYPT

Egypt carries the largest measured plastic burden in the Mediterranean and the region's highest respiratory disease burden, and it also holds the most concentrated opportunity: 5 of the 10 localities that contribute most to the sea, and a rural population 2 thirds of which waste collection does not yet reach.

What this means for Egypt: enforce the instruments already in law; extend collection in the Nile Delta governorates; widen producer responsibility from bags to the full packaging stream, including tourism and hospitality; and use the treaty's financial mechanisms to fund a transition that strengthens Egyptian recyclers and converters for tightening markets.

5. MOROCCO: FINISH WHAT HAS BEEN STARTED

Morocco has regulated plastic bags for longer than any country in the region and collects the vast majority of its plastic waste. The next step is the one that turns collection into recovery, and it is already planned.

5.1 THE FLOW

Morocco generates 3.97 million tonnes of municipal solid waste a year, of which 422,000 tonnes is plastic. About 250,000 tonnes of that plastic is mismanaged and 75,000 tonnes reaches the sea, 17.8% of everything the country generates (World Bank, 2024a). Collection is a story of 2 Moroccos: urban collection reached about 96% in 2019 while rural collection was about 10% (World Bank, 2024a). The rural gap is the clearest single opportunity in the Moroccan system, and closing it is a matter of extending a service that already works in the cities to the communities beyond them.

About 81% of Moroccan industry sits on the coast, coastal areas contribute 59% of GDP and 52% of jobs, and 65% of the population lives within 100 kilometres of the sea (World Bank, 2022a; 2024a). Most of that coast faces the Atlantic: Morocco has about 393 kilometres of Mediterranean coastline in the basin modelling against 1,214 for Tunisia and 1,330 for Egypt (Boucher and Billard, 2020), and the coastal pollution hotspots the World Bank identifies are mostly Atlantic too: Casablanca, its single priority hotspot, and 8 of the 11 other hotspots and sensitive areas, from Kenitra to Sidi Ifni, are on the Atlantic coast, with only Tétouan and Nador, and Tangier at the Strait, facing the Mediterranean (World Bank, 2024a). Because the cost figures in this report count Mediterranean damage only, Morocco's US\$1.2 billion a year is a floor. The Atlantic bill is additional.

5.2 FIFTEEN YEARS OF LEADERSHIP ON PLASTIC BAGS

Morocco has the longest record of plastics regulation in the region. Law 22-10 of 2010 prohibited the manufacture, import, sale and distribution of non-degradable plastic bags. Law 77-15 of 2015 extended this to a full ban, and Law 57-18 of 2020 added reporting requirements and clearer inspection roles (World Bank, 2024a). Official reviews of the first 2 years identified 104 formal industrial units and 3,840 direct and indirect jobs in the bag subsector, supported through a MAD 200 million conversion fund, alongside inspections, seizures, prosecutions and growth in alternative products (Kingdom of Morocco, Ministry of Industry and Trade, 2017; 2018). The conversion fund is the reason those jobs were identified and supported rather than lost, and the reporting rules are the reason implementation can be assessed at all. Morocco has shown the region how to legislate for reduction and protect the workers affected at the same time.

The next step is capacity. The same reviews record that prohibited bags persisted in souks and street commerce, and of 26 sorting centres planned nationally, 9 have been built and 3 are operating (World Bank, 2024a). Only 15% of plastic waste goes uncollected, yet 73% of what is collected is not recycled (World Bank, 2024a). The constraint is sorting rather than collection, and it is addressable: 23 planned centres await commissioning. Sorting turns collection into recovery, but it does not reduce the volume of plastic entering the system, and the basin modelling in Chapter 7 shows that waste management on its own is not enough. Morocco's strongest next step pairs the sorting capacity already planned with measures that reduce plastic at source. The lesson Morocco offers the global plastics treaty is that a measure should be funded for enforcement and infrastructure at the moment it is adopted, and Morocco is positioned to be the country that demonstrates it. It is also why finance and a just transition belong at the centre of the treaty: the region's gap is not in laws or plans but in the money to run them and to protect the workers who depend on the current system, and a treaty that funds both is the one that would change Morocco's numbers.

Morocco collects 85% of its plastic waste and has regulated plastic bags since 2010. Commissioning the 23 sorting centres already planned would turn a collection success into a recycling one (World Bank, 2024a).



5.3 THE PATHWAYS

3 pathways follow, each building on the 1 before it. A low-cost pathway commissions the sorting centres already planned and enforces the bag legislation already in force. A managed transition extends collection to rural areas and implements the 3-phase formalisation roadmap for informal workers that already exists with named responsible entities (World Bank, 2024a). A high-ambition pathway applies producer responsibility across the packaging stream and captures the circular economy investment that tightening export markets are already offering. None of these threatens an export industry, because Morocco's plastics sector does not have one. Each of them removes part of a cost of about US\$1.2 billion a year that Morocco carries now, and the high-ambition pathway removes the most, because it is the only one that reduces the plastic entering the system rather than managing it afterwards. Chapter 7 sets out what the modelling can and cannot say about the size of that saving.

RECAP: MOROCCO

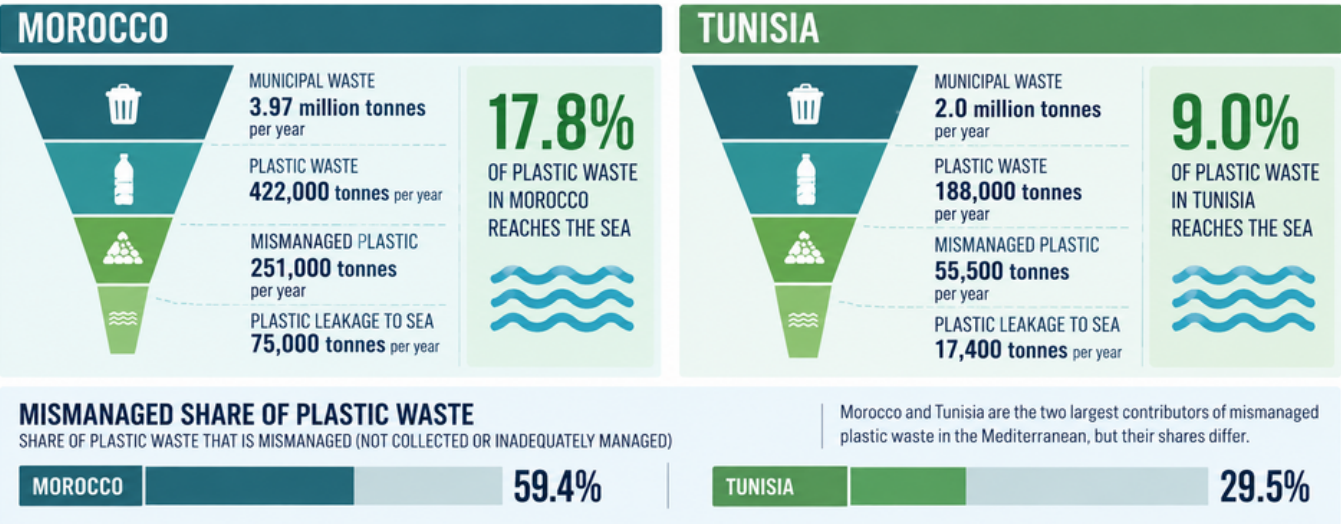
Morocco carries an estimated US\$1.2 billion a year in Mediterranean plastic damage, a floor that excludes its Atlantic coast, while its plastics industry imports 70% of its inputs and exports 9% of its output. Fifteen years of bag regulation and a conversion fund that protected 3,840 jobs give it the region's strongest record on reduction. What this means for Morocco: commission the 23 planned sorting centres; extend collection to the rural 90%; implement the formalisation roadmap already written; and champion production reduction in the treaty, because reducing plastic in Morocco replaces imports rather than displacing industry.

6. TUNISIA: THE CLEAREST CASE FOR ACTING

Tunisia runs the best-performing waste system of the 3, lives almost entirely on its coast, and has no plastic production to protect. Its interest in reducing plastic, nationally and globally, is the most direct of any country in this study.

6.1 THE FLOW

Tunisia generates 2 million tonnes of municipal waste a year, of which 188,000 tonnes is plastic. About 55,500 tonnes of that plastic is mismanaged and 17,000 tonnes reaches the sea, 9.0% of what the country generates (World Bank, 2024b). Assessed by the same source on the same method, Tunisia outperforms Morocco at every stage of the cascade: it mismanages 29.5% of its municipal waste against Morocco's 59.4% and leaks 9.0% of its plastic against 17.8%. Tunisia has the better-performing system, and it still carries a cost of about US\$0.4 billion a year.



Source: World Bank (2024a; 2024b). Same sources, same method, so figures are comparable between countries. Totals are rounded.

6.2 AN ECONOMY THAT LIVES ON ITS COAST

Tunisia is the most coastal of the 3. Its 1,670 kilometre coastline is home to more than 2 thirds of the population, some 7.6 million people, and 85% of Tunisians live within 100 kilometres of the sea (World Bank, 2022a; 2024b). The blue economy contributed nearly 14% of GDP in 2018, with coastal tourism and fisheries providing about 450,000 jobs, and coastal tourism accounts for about 95% of the tourism sector's contribution to GDP (World Bank, 2024b). Practically the entire sector sits where the plastic arrives. With real growth of 0.4% in 2023 and unemployment at 16.4% (World Bank, 2024b), Tunisia can afford neither a cost of this size nor to finance the answer alone.

6.3 WHAT IS ON THE BEACHES

A field survey of 9 beaches across 4 priority hotspots, using the standard Mediterranean monitoring method with 66 people trained through local organisations, collected 9,821 items weighing 187 kilograms. Plastic was 77% of items, and fishing nets and net fragments were the largest category by weight at 22.2% (World Bank, 2024b). Microplastic sampling found fragments and foam dominant, so the microplastic on Tunisian beaches is formed from larger items breaking down, and measures aimed at larger plastic address both.

Of the items traceable to an origin, 98.2% were Tunisian (World Bank, 2024b). The findings point to 2 measures with a direct physical justification: producer responsibility extended to fishing gear alongside packaging, and reduction, reuse and refill in the coastal hospitality sector, which is where about 95% of Tunisian tourism output and 90% of its accommodation sit (Section 6.2).

6.4 A RECOVERY SYSTEM READY TO BE REPRICED

Tunisia built a national packaging recovery system, and it worked: 15,800 tonnes were collected in 2009 to 2010, more than 70% of it plastic (World Bank, 2024b). By 2020 the volume had fallen below 3,000 tonnes (World Bank, 2024b), while the infrastructure remained in place: 175 of 243 approved collection companies operate, and 65 of 150 approved recycling units, leaving about 57% of approved recycling capacity idle (World Bank, 2024b). The cause, on the World Bank's own figures, is a price structure, not a failure of will or a fall in packaging. The national agency pays collectors TD 0.75 per kilogram for PET while recyclers pay TD 0.25 for the same material, so the agency absorbs a threefold gap on every kilogram and rations the volume it can afford to accept (World Bank, 2024b). Supporting collector incomes is the right policy. Financing it from the resale value of the material is the wrong model, because, as Chapter 2 shows, that value is a tenth of what the system needs.

The fix is a financing reform rather than a new programme. Converting the environmental protection tax from a general import levy into a producer responsibility charge, paid in proportion to the packaging each company places on the market, funds the price gap from the companies that create the waste and keeps collector incomes intact. The collection companies, the recycling units and the social plan for collectors already exist. What is missing is the money flowing through them in the right direction.

Tunisia has 243 approved collection companies, 150 approved recycling units and a social plan for its collectors. Repricing the system that connects them is an administrative reform, and it would put 57% of idle recycling capacity back to work (World Bank, 2024b).

6.5 THE PATHWAYS

Tunisia restricted the production, import, distribution and possession of single-use plastic bags by decree in January 2020 (World Bank, 2024b). Three pathways follow, each building on the one before it. A low-cost pathway reprices the recovery system and enforces that decree. A managed transition reforms the environmental tax into a functioning producer responsibility scheme and implements the social plan for collectors. A high-ambition pathway scales the reduction, reuse and refill measures for tourism that the World Bank designed with hotels in Djerba, the island that anchors Tunisian beach tourism and 1 of the 4 litter hotspots surveyed (World Bank, 2024b), and applies producer responsibility to fishing gear. It is the pathway this report's evidence points to, because Tunisia's coast is coastal and its industry is untouched by reduction. With about 95% of tourism output on the coast, reuse and refill in hospitality reaches a larger share of the national economy in Tunisia than anywhere else in this study, and the economics work at facility level: a hotel replacing single-use bottles with refillable filtered water at 50 bottles a day saves about US\$4,788 a year (World Bank, 2024a). Producer responsibility on fishing gear rests on a direct measurement, 22.2% of beach litter by weight, and places the cost of gear lost at sea on manufacturers rather than on the fishers who currently bear it.

Tunisia's position in the treaty negotiations follows from its economy. It has 23,463 conversion workers and no polymer industry. Every measure that reduces global plastic production lowers the cost Tunisia carries and leaves its industry in place, with any change in polymer prices a transition cost shared by every importing country and one that support for converters can address. A treaty that omits production reduction leaves Tunisia paying for a problem it did not create, with a cost that doubles by 2040. That is the national interest at stake, and it is why Tunisia's voice for production reduction matters.

RECAP: TUNISIA

Tunisia has the best-performing waste system of the 3, the most coastal economy, a documented converting industry of 23,463 workers and no polymer production. Its recovery system, its collection companies, its recycling units and its social plan for collectors all exist and are waiting on a financing model.

What this means for Tunisia: reprice the recovery system through a real producer responsibility charge; enforce the 2020 bag decree; scale reduction, reuse and refill in coastal tourism; apply producer responsibility to fishing gear; and champion production reduction in the treaty, because it lowers a cost Tunisia carries without touching the industry it has.

7. WHAT ACTION WOULD SAVE

The case for action does not rest on the costs alone. It rests on the finding that the measures available would avoid a substantial share of those costs at a cost roughly equal to the damage avoided, while delivering health, fiscal and environmental returns that no cost figure in this report captures.

7.1 WHAT THE BASIN MODELLING SHOWS

The modelling of the whole Mediterranean produces 4 results that matter for this decision (Boucher and Billard, 2020). Without intervention, annual leakage doubles to more than 500,000 tonnes by 2040. A basin-wide restriction on straws, plastic bags and microbeads reduces leakage by about 23%, so restrictions on the most avoidable items work, but on their own they are not enough. Bringing the 100 highest-contributing localities to high-income waste standards removes roughly a quarter of total leakage. And holding leakage at 2018 levels requires cutting mismanaged waste by 1.7% every year. Read together, the results argue for reduction and waste management pursued at the same time, and against waiting.

7.2 AVOIDED COST AGAINST TRANSITION COST

Combining the physical effect of a measure with the annual cost of inaction gives the avoided cost. Against it sits the cost of the transition, for which 1 benchmark covers all 3 countries: establishing basic but universal waste collection and environmentally sound disposal in a middle-income country requires roughly 0.3 to 0.5% of GDP a year, against reported public spending below 0.15% in most low and middle income countries (World Bank, 2026a). The gap is therefore in the order of 0.15 to 0.35 percentage points of GDP a year.

COUNTRY	AVOIDED AT 23% (SINGLE-USE RESTRICTIONS)	AVOIDED AT 25% (TOP LOCALITIES UPGRADED)	TRANSITION COST (BENCHMARK GAP)
Egypt	US\$0.06 to 0.72 billion	US\$0.06 to 0.78 billion	US\$0.58 to 1.36 billion
Morocco	US\$0.17 to 0.58 billion	US\$0.19 to 0.62 billion	US\$0.23 to 0.54 billion
Tunisia	US\$0.02 to 0.14 billion	US\$0.03 to 0.15 billion	US\$0.08 to 0.19 billion

Table 4. Avoided cost against transition cost, US dollars a year at 2024 prices. Effect percentages are basin-level, applied nationally. Transition cost is the gap between the middle-income benchmark and reported spending (World Bank, 2026a). Sources as for Table 1.

The table understates the return on both sides, and both understatements favour action. The avoided cost counts marine plastic damage in the Mediterranean only, so for Morocco, most of whose coast faces the Atlantic, it is a floor. The transition cost is the price of collecting and safely disposing of all municipal waste, not only plastic. That spending also cuts respiratory disease, flooding, clean-up and other marine damage, none of which appears in the table. The avoided plastic damage on its own roughly covers the cost of the transition, and every other benefit comes on top. The same source finds that lower waste volumes reduce overall system costs, so ambition on reduction lowers the bill for waste management rather than raising it (World Bank, 2026a). The health return is documented too: integrated waste management programmes in Rwanda and Kerala, combining plastic restrictions, decentralised collection and community action, cut waste-related health problems by 30 to 50% within 5 years (Woime, 2026).

7.3 FINANCING THE TRANSITION

The transition cannot be financed from domestic budgets alone, and the evidence for that is the strongest part of the case for international finance. Tunisian municipalities recover about 17.5% of their waste costs locally. Moroccan municipalities in the sampled set already spend 34% of recurrent budgets on waste with about US\$126 million unpaid (World Bank, 2024b; 2024c). Tunisian growth was 0.4% in 2023 (World Bank, 2024b). The demand is specific. Universal collection and safe disposal cost a middle-income country 0.3 to 0.5% of GDP a year; the 3 countries spend under 0.15% (World Bank, 2026a). The gap of 0.15 to 0.35 percentage points of GDP a year is what a treaty financial mechanism would need to cover for these countries to run the systems they have already designed. It is the first quantified basis for that ask from this region, it is a far more credible ask than a large claimed return, and it is modest next to the cost of inaction in Table 2. All three countries have argued for financial mechanisms in the negotiations. This report gives that argument its number.

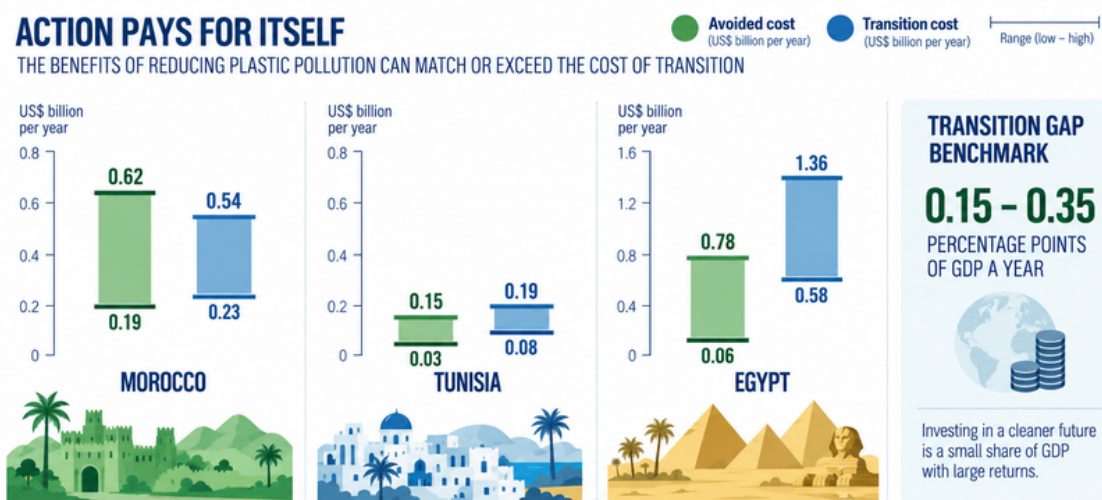
The worker transition is already designed. Morocco has a three-phase formalisation roadmap with named responsible entities. Tunisia has a social plan for informal collectors identified as an immediate next step (World Bank, 2024a; 2024b). Pricing those plans, per worker registered, protected and equipped, is the one piece of preparation that would let either country walk into a negotiation with a just transition plan that has a price attached.

8. FINAL TAKEAWAYS: THE CASE FOR ACTING NOW

Across the three countries a shared pattern emerges. The cost of plastic pollution is measured, present and rising; the benefit of the current system is concentrated and, in two countries, not national at all; and the measures that would change course are practical, already designed and, on the narrowest accounting, pay for themselves.

8.1 WHAT EACH COUNTRY CAN DO NOW

The largest part of the problem can be addressed nationally, now, without waiting on any international decision. Six measures stand out because each addresses a measured constraint and each delivers its benefit to the people currently carrying the cost.



Source: Economic modelling based on Beaumont et al. (2019), Boucher and Billard (2020), World Bank (2023a; 2024a; 2024b; 2026a). Avoided cost shown here uses the 25% scenario: upgrading the highest-contributing localities. Transition cost is the benchmark gap for universal collection and environmentally sound disposal. Benefit counts Mediterranean plastic damage only. Cost buys universal collection of all waste, which also avoids health, flooding and clean-up costs not counted. US dollars, 2024 prices.

Extend collection where coverage is lowest. Rural collection at 10% in Morocco and 35% in Egypt is the largest single gap identified, and the households beyond it are the ones living beside open dumping and burning.

Commission the 23 Moroccan sorting centres already planned. Morocco collects its plastic. Sorting it is the step that turns collection into recycling.

Reprice Tunisia's packaging recovery system through a real producer responsibility charge. About 57% of approved recycling capacity is idle for want of a financing model. This is an administrative reform, not an investment programme.

Invest in the localities that leak most. 5 of the 100 largest contributors to Mediterranean leakage are Egyptian. Nowhere else does targeted municipal investment move the basin total as far.

Widen producer responsibility to the full packaging stream in all 3 countries. Each country has a producer responsibility measure that reaches plastic bags and little else. Extending it to all packaging, including tourism and hospitality, is the reform that makes every other measure financeable, because it is the only model under which those who place packaging on the market pay for its recovery.

Enforce the single-use measures already adopted. Morocco has banned plastic bags since 2010, Tunisia restricted them by decree in 2020 and Egypt has a national single-use plastics strategy. Prohibited bags still circulate in Moroccan souks (World Bank, 2024a). Enforcement funded at the point of adoption is the cheapest reduction measure available, and it delivers a measured effect: a basin-wide restriction on the most avoidable items cuts leakage by about 23% (Boucher and Billard, 2020).

Two further measures rest on direct measurement: reduction, reuse and refill in coastal hospitality, strongest in Tunisia where 95% of tourism output is on the coast, and producer responsibility for fishing gear, the largest item on Tunisian beaches by weight.

8.2 WHAT THE THREE COUNTRIES SHOULD ASK FOR INTERNATIONALLY

The evidence in this report supports four concrete demands in the treaty negotiations and in any other international forum where these countries speak.

Production reduction in the treaty text. A measure that reduces how much virgin plastic is produced lowers the cost Tunisia and Morocco carry and reaches no industry either country has; for Egypt it is a decision to take with its own data.

A financial mechanism sized to the gap. Universal collection and safe disposal require 0.3 to 0.5% of GDP a year and the three countries spend under 0.15% (World Bank, 2026a). A mechanism that covers 0.15 to 0.35% of GDP a year for middle-income countries is the quantified ask.

Enforcement and infrastructure funding attached to every measure adopted. Morocco's 15 years of bag regulation show that adoption without funded enforcement and sorting capacity delivers less than it should (World Bank, 2024a).

Just transition provisions for informal workers. Formalisation, safer conditions, social protection and a voice for the collectors who recover most of the region's plastic, funded through the same mechanism, with the Moroccan roadmap and the Tunisian social plan as the blueprints (World Bank, 2024a; 2024b).

The negotiations towards a legally binding instrument on plastic pollution cover the full lifecycle of plastic, from production and design to disposal. The question for each government is whether a strong treaty, one that addresses how much plastic is produced as well as how it is managed, serves its national interest, and for Tunisia and Morocco the evidence answers plainly. Both carry a measured cost of plastic pollution. Neither produces the polymer that a production measure would reach. Both import the raw material that reduction would displace. A treaty with production reduction in it lowers their cost and leaves their industries intact. A treaty without it leaves them paying a bill that doubles by 2040 for a problem generated largely upstream of them. Their interest is in production reduction staying in the text, and in being the countries that say so.

For Egypt, the interest lies in the financing mechanisms it has already championed and in the national measures set out in Chapter 4, which reduce the largest measured burden in the basin and position its industry for markets that are tightening whatever the treaty says. The industrial question is Egypt's to weigh with its own data. The cost of inaction does not wait for that decision.

Two lessons from the region belong in the instrument's design. A measure should be funded for enforcement and infrastructure at the point it is adopted, because Morocco has shown what 15 years of leadership can achieve and where capacity has to follow. And every reduction policy should carry documentation, formalisation, safer conditions and social protection for the workers who currently recover most of the region's plastic, because the plans to deliver that already exist in Morocco and Tunisia and need only to be costed and funded.

Ultimately, the plastic on the southern shore of the Mediterranean is a global problem with national solutions, and the solutions are cheaper than the problem. Plastic pollution costs Egypt, Morocco and Tunisia an estimated US\$1.7 billion to US\$5.5 billion a year before health, fisheries, agriculture and the burden on waste workers are counted, and the flow doubles by 2040. The cost falls on public budgets, coastal communities and households. The benefit is concentrated, and in 2 of the 3 countries there is no polymer industry for production measures to harm. The most effective responses are practical, already designed and, on the narrowest accounting, pay for themselves. Delay is the one option that costs more every year.

ANNEX: ECONOMIC MODELLING METHODOLOGY

A.1 Analytical Framework

The analysis applies a 5-module framework to each country: (A) physical baseline and system mapping; (B) cost of inaction; (C) benefits retained under business as usual; (D) benefits of reduction pathways; and (E) net comparison. The cost of inaction is assessed on a direct cost accounting basis, attributing cost to identifiable activity (government clean-up, tourism and fisheries revenue effects, and marine environmental damage) rather than to a valuation of marine natural capital. Marine natural capital valuation is not used as the primary basis because its authors state that their estimate excludes the social and economic costs to tourism, fisheries, shipping and human health (Beaumont et al., 2019); applying that method and describing the result as a loss to those sectors would misattribute the estimate.

A.2 Physical Baseline

For each country the analysis traces municipal solid waste generated, the mismanaged fraction, plastic waste generated, mismanaged plastic and leakage to the marine environment. Morocco and Tunisia are traced on a single consistent basis, because the World Bank published the same 5-stage cascade for both countries in the same year using the same method, for 2022 activity (World Bank, 2024a; 2024b). Egypt is not available on that basis. Egyptian leakage is taken from basin-wide modelling of 2018 activity (Boucher and Billard, 2020), and Egyptian waste generation from national sources covering municipal, agricultural and drainage streams (Faragalla, Kotb and Galal, 2025) and from a value chain study (UNIDO, 2021). Egyptian waste figures are therefore not compared with the Moroccan and Tunisian cascade, and Egyptian plastic waste generation is reported as a range of 3.6 to 5.4 million tonnes rather than adopted as a point value.

A.3 Estimation of the Annual Cost of Inaction

All country cost figures are benefit transfers: a unit damage cost established in the literature is applied to national leakage or national output. No figure is a directly measured national cost. 3 methods are applied and reported separately; they measure different constructs and are never summed or treated as mutually corroborating.

- **Method A, leakage-based welfare loss.** A unit damage cost per tonne of plastic entering the marine environment, incorporating lost ecosystem services, is applied to national annual leakage. The published global range is US\$3,300 to US\$33,000 per tonne (Beaumont et al., 2019). Following World Bank practice for the Mediterranean, a semi-enclosed, densely populated and tourism-intensive sea, the range applied is US\$10,000 to US\$33,000 per tonne. National leakage is 75,000 tonnes for Morocco and 17,000 tonnes for Tunisia (World Bank, 2024a; 2024b) and 74,031 tonnes of macroplastic for Egypt (Boucher and Billard, 2020).
- **Method B, output-based cross-check.** Annual cost is expressed as a share of gross domestic product using the regional average of 0.8% covering tourism, fisheries, shipping and livelihoods (World Bank, 2023a), applied to 2024 GDP.
- **Method C, published country estimate.** Available for Morocco only, at US\$0.75 billion to US\$2.5 billion a year (World Bank, 2024a).

Where an independent method falls inside the range produced by another, it is adopted as the central estimate. The central estimate is therefore not a midpoint and not a fourth estimate. For Morocco the central value of about US\$1.2 billion is Method B (US\$1.24 billion) falling inside both the published range and the Method A range of US\$0.75 billion to US\$2.48 billion. For Tunisia the central value of about US\$0.4 billion is Method B (US\$0.43 billion) falling inside the Method A range of US\$0.17 billion to US\$0.56 billion. For Egypt, Method B (US\$3.11 billion) lies above the Method A range (US\$0.74 billion to US\$2.44 billion), reflecting Egypt's lower leakage intensity per unit of output (190 tonnes per US\$ billion against 486 for Morocco and 318 for Tunisia) and the exclusion of Red Sea leakage from Mediterranean modelling. The Egyptian cost is therefore reported as a range of US\$0.74 billion to US\$3.1 billion without a central value, with the lower bound treated as a floor. The combined figure of US\$1.7 billion to US\$5.5 billion is the sum of the 3 leakage-based (Method A) ranges, US\$1.66 billion to US\$5.48 billion, and is an indicative aggregate. Egypt's output-based figure is not added to the leakage-based figures of the other two countries, because the two methods measure different constructs; substituting it would give an upper bound of about US\$6.2 billion.

A.4 Cumulative Cost of Delay

The cumulative cost of delay is the present value of the annual cost of inaction over a 15-year horizon to 2040, discounted at 3% (annuity factor 11.94). A growth adjustment applies an average multiplier of 1.5 across the period to reflect the projected doubling of Mediterranean leakage by 2040 under business as usual (Boucher and Billard, 2020). Results are cumulative present values, not annual figures, and inherit every limitation of the annual estimates. The horizon, discount rate and growth assumption are stated wherever the figures are used.

A.5 Price Base, Currency and Exchange rates

All monetary values are expressed in United States dollars at 2024 prices. Exchange rates are World Bank official period-average rates matched to the year of each original value, not the year of reporting. Nominal and real values are not mixed, and purchasing power parity is not used. Local currency values are retained where they are the transacted basis, as for the Tunisian recovery system prices in dinars. Discounting is applied only within the labelled multi-year analysis at A.4.

A.6 Benefits Retained Under Business as Usual

Benefits retained under the current system are assessed for value added, output, exports, fiscal revenue, employment, packaging function, consumer benefit and informal livelihoods. For each, the analysis distinguishes gross turnover from value added, domestic from externally owned value, and benefit that would survive a managed transition from benefit that would not. Gross industry turnover is never equated with net national benefit. The Egyptian sector figure is petrochemical revenue as reported by the International Trade Administration (2025) and is treated as gross revenue for petrochemicals as a whole. The Tunisian sector value is derived: the formal workforce recorded in the national business register (INS, 2024) is multiplied by manufacturing value added per manufacturing worker (World Bank, 2025a; INS, 2023) for the lower bound and by GDP per person employed (World Bank, 2025b; INS, 2023) for the upper bound, at market exchange rates, giving US\$280 million to US\$330 million a year. The Moroccan sector is characterised by published ratios (World Bank, 2024a) because no sector value is published.

A.7 Reduction Pathways and Avoided Cost

Three pathways are specified for each country: low-cost improvement, managed transition and high ambition. The pathways are cumulative: each includes the measures of the pathway before it.

Measures are country-specific and each is classified as reduction, reuse, recovery or disposal, so that gains in recovery are not presented as reductions in plastic use. Avoided cost is the product of a modelled physical effect and the annual cost of inaction. 2 basin-level effects are applied nationally as illustrative parameters: a 23% reduction in leakage from a basin-wide restriction on straws, bags and microbeads, and a 25% reduction from bringing the 100 highest-contributing localities to high-income waste management standards (Boucher and Billard, 2020). The basin model tests waste management and single-use restrictions only; it does not test upstream production measures, and no inference about their value is drawn from its results. Transition cost is benchmarked as the gap between the 0.3 to 0.5% of GDP required for universal collection and environmentally sound disposal in middle-income countries and reported public expenditure below 0.15% of GDP (World Bank, 2026a). It is a benchmark for all municipal waste, not a national plastics costing.

A.8 Attribution Rules and Exclusions

Four categories of evidence are kept separate throughout: costs directly measured in the focus country; costs estimated through a country-calibrated proxy; exposed economic value that cannot be described as attributable loss; and qualitative impacts that are not monetised. Exposed sector value in tourism, fisheries and agriculture is reported as exposure and is not converted into loss, because no country-specific attribution factor exists. Health effects are reported through the documented exposure pathway and published relative risks (World Health Organization, 2025a; 2025b; Woime, 2026) and the national disease burden (Ashrafi-Asgarabad et al., 2023); no monetary health estimate is made because the exposed share of population living near unmanaged waste sites is not published. The cost estimates value welfare loss including ecosystem services and do not represent fiscal cost to the government. Double counting is controlled between municipal and total waste budgets, clean-up and tourism, ecosystem services and fisheries, industry turnover and value added, and avoided public cost and benefits counted elsewhere. Every exclusion operates in the same direction: the reported cost of inaction is a lower bound.

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