

Military & Conflict–Related Emissions & Climate Reparations for Palestine

'Military & conflict-related emissions & climate reparations for Palestine' is prepared by Tipping Point North South and the Palestinian Institute for Climate Strategy.

It is released to coincide with the civil society *'Draw the Line'* global week of action, taking place as world leaders gather at the UN General Assembly in New York, and just six weeks before the UN Climate Summit (COP30) in Belém, Brazil.

The paper provides an estimate of carbon-emission-based costs of the traceable military-related activities by Israel and its allies. This quantification represents a fraction of the total climate reparations owed to Palestine. When accounting for the broader social, economic, and environmental devastation of Israel's historical occupation, the ongoing genocide and ecocide of the Palestinians, and the wholesale environmental destruction of Palestinian land and lifeforms, the total reparations needed would be significantly higher. **While the quantification of military and conflict-related emissions offers one measurable entry point into climate harms and accountability, it does not capture the full scale of colonial violence as climate violence, which extends beyond what can be reduced to carbon metrics.**

A more detailed paper can be found at www.transformdefence.org/publication/climatereparationsforpalestine.

This work is part of a wider project addressing the military and conflict-related emissions of the world's top 20 military spenders and their climate reparations debt. The research will be published in advance of COP30 in Belém, Brazil, in November.

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1. Military & Conflict-Related Emissions & the Corresponding Climate Reparations for Palestine

WHY ISRAEL'S MILITARY & CONFLICT-RELATED EMISSIONS MUST BE IN THE REPARATIONS RECKONING FOR PALESTINE

In this paper, we quantify **the historic military and conflict-related emissions** of the 77 years of Israel's occupation of Palestinian land since its founding in 1948, culminating in the ongoing genocide of Palestinians for nearly two years. By applying the monetary measure '**the social cost of carbon**', that is, the long-term social and environmental damage done by emitting one additional tonne of carbon, **the paper calculates the climate reparation owed to date by Israel to the Palestinian people as a result of these historic military and conflict-related emissions.**

Ultimately, the purpose of this research is to argue that military & conflict-related emissions must be recognised as a core component of **the reparations owed to the Palestinian people.** They must be added to the broader list of damages for which Israel and its allies are accountable, from decades of military and financial support for Israel's apartheid regime to present-day material backing for its genocide of the Palestinian people.

This reckoning must also address the intertwined realities of genocide and ecocide. The international movement to add ecocide as the fifth international crime prosecuted by the International Criminal Court (ICC) alongside genocide, war crimes, crimes against humanity and aggression, provides the definition of ecocide as *"unlawful or wanton acts committed with knowledge that there is a substantial likelihood of severe and either widespread or long-term damage to the environment."* This legal tool must be wielded to evidence the deliberate environmental destruction committed against Palestinian lives and lifeforms, in demand for prosecution.¹

¹ This argument draws strength from international jurisprudence. In her declaration to the recent International Court of Justice advisory opinion on climate change, Judge Cleveland affirmed that states' obligations under climate treaties and customary international law extend to harms caused by armed conflict and military activities. Excluding such harms distorts the global picture of warming and undermines collective action. Conflict-related emissions are not peripheral but central to climate accountability and must be included in any reparations framework.



Key Findings

To date, the total estimated amount of the **military and conflict-related climate reparations** owed by Israel and its allies to the Palestinian people **since the Nakba** is **US\$148 billion**. Of this,

- **Israel is responsible for US\$103 billion.**
- **The U.S. is responsible for US\$40.8 billion.**
- Israel's allies share further responsibility: Germany US\$2.7 billion, France US\$1 billion, the UK US\$0.5 billion, and Italy US\$0.17 billion.

These figures represent the *measurable climate liability* of military and conflict-related emissions. Yet, as this paper makes clear, they capture only one entry point into the broader reparations reckoning for Palestine to date, which must also encompass the wider harms of occupation, genocide, ecocide and systemic destruction of Palestinian life. Many of these aspects are beyond what we can quantify in simplified carbon metrics, and we must not lose sight of this complexity in rebuilding just futures for Palestine.

How this Breaks Down

OCCUPATION 1948 TO PRESENT DAY

- According to the Stockholm International Peace Research Institute (SIPRI), Israel's total military expenditure during these years (1949–2024) amounts to US\$932 billion (in constant 2023 US\$).²
- We estimate the corresponding military carbon footprint to be 362,000,000 tCO₂e.
- **The (SCC) climate cost is therefore US\$93 billion**, allocated accordingly:
 - Israel US\$74.9 billion.
 - USA US\$14 billion, Germany US\$1.6 billion, France US\$1 billion, UK US\$0.5 billion and Italy US\$0.17 billion.

UNITED STATES MILITARY AID

- US military aid is only for the procurement of military equipment, services and training. The total US military aid to Israel, amounting to US\$251.2 billion,³ results in 181 MtCO₂e of greenhouse gas (GHG) emissions.
- **The additional climate cost of this amount of emissions is US\$46.7 billion.**
- We apportion 50/50: Israel US\$23.4 billion; USA US\$23.4 billion.

² <https://milex.sipri.org/sipri>

³ <https://watson.brown.edu/costsofwar/papers/2024/USspendingIsrael>



CONFLICT-RELATED EMISSIONS EMISSIONS OF THE ONGOING GAZA GENOCIDE

- Latest research estimated the emission burden of the Gaza genocide by Israel (since October 2023 to January 2025) to be 32 MtCO₂e, including emissions from direct war activities as well as pre-conflict and post-conflict related construction.⁴
- Approximately 30% of GHG emissions from direct war activities since the war began came from the U.S. provision of 50,000 tonnes of weapons and supplies to Israel.
- According to SIPRI, 99% of arms imports for Israel in recent years came from the USA (69%) and Germany (30%).⁵
- **The climate cost for the current Gaza genocide is around US\$8.3 billion.**
 - Israel as perpetrator of genocide: US\$4.7 billion.
 - USA US\$2.5 billion; Germany US\$1.1 billion.

2. Methodology

Estimating Military Carbon Footprint & the Climate Costs

Militaries and their wars exert enormous social, economic and environmental costs.⁶ Beyond these unacceptable and unnecessary costs lies a significant but often neglected climate impact: the emissions associated with military activities, both in wartime and peacetime. Despite their scale, such emissions remain glaringly absent from international climate negotiations.

Our methodology builds on Tipping Point North South's joint report with the Transnational Institute and Stop Wapenhandel in 2023.⁷ We have since updated the methodology to include non-NATO countries, e.g. Israel. *(A further update on this paper and the complete report on the top 20 military spenders and climate reparations will be published later for COP30.)*

⁴ <https://dx.doi.org/10.2139/ssrn.5274707>

⁵ <https://www.sipri.org/databases/armstransfers>

⁶ <https://watson.brown.edu/costsofwar/papers/summary>

⁷ <https://transformdefence.org/publication/climate-crossfire-how-natos-2-military-spending-targets-contribute-to-climate-breakdown/>



The military 'carbon footprint' (excluding conflict-related emissions) can be separated into three categories:

- **Stationary:** operational GHG emissions (scope 1 and 2) from military bases, ministries of defence and related civil transport activities.
- **Mobile:** emissions from mobile military activities, involving military aircraft, naval vessels, land vehicles and spacecraft.
- **Supply-chain:** scope 3 upstream emissions stemming from arms producers and supporting industries (e.g. food and accommodation for active personnel, private security contracts).

To estimate the military carbon footprint, we use this formula:

Carbon footprint of military and the associated military technology industry = (military expenditure) × (proportion spent on equipment) × (spend–emission conversion factor) + (number of military personnel) × (average stationary emission per military head)

The first part (military expenditure × proportion spent on equipment × spend–emission conversion factor) accounts for both the mobile and the supply-chain emissions⁸ Not all aspects of military expenditure, for example, pensions, are relevant to mobile or supply-chain emissions; what is most relevant is the proportion spent on military equipment, such as fighter jets, tanks, and warships. The second part (number of military personnel × average stationary emission per military head) accounts for the stationary emissions.

NOTE: Since there is a severe lack of transparency by governments on the relevant data for accurate analysis, our estimates are for guidance, and the intention is to raise awareness of this issue. On this issue, there remains a great need for more detailed and precise calculations to be undertaken by those legal bodies charged with holding aggressors accountable for their crimes.

Monetary Framework to Address Climate Costs: The Social Cost of Carbon

The social cost of carbon (SCC) is a monetary measure of the long-term damage done by emitting one additional tonne of carbon emissions — or conversely, the benefit of reducing a tonne of carbon emissions.⁹ The SCC was estimated by scientists to be around \$258 per tonne of CO₂ equivalent.¹⁰

⁸ Most Israeli military equipment is made in USA so the spend–emission conversion factor for Israel is assumed to be the same as the USA, estimated to be 0.000721 tCO₂e per dollar. The average stationary emission per military head for Israel was estimated to be 9 tCO₂e.

⁹ <https://www.nature.com/articles/s41586-022-05224-9>

¹⁰ <https://www.nature.com/articles/s41467-021-24487-w>



The SCC gives us a framework to address the climate (ie carbon) costs of (in this case) military emissions, in addition to its other more well-known social (eg civilian casualties, refugees, human rights and built-environment destruction), economic (opportunity cost and war profiteering) and environmental (habitat loss, pollution and health) costs.¹¹

However, it is essential to underscore that while the SCC provides a valuable entry point for quantifying climate damages, it also has limitations in the Palestinian context. The metric rests on modelling assumptions via global averages, which can obscure regional specificities, and in this case, the disproportionate harms borne by Palestinians considering their lived realities and the compounding effects of the occupation. It can also obviate impacts stemming from tipping points and abrupt socio-political or ecological shifts. Therefore, our SCC estimates provide the lower bound of the total associated climate costs.

3. What Israel – and its Allies – Owe in Military and Conflict-Related Climate Reparations

Human lives are priceless and irreplaceable. For survivors, especially for children¹² and women¹³, the physical harm and trauma are not only lifelong but will endure across generations.

Israel's genocide against Palestinians in Gaza and its crimes against humanity¹⁴ will be made accountable by the International Criminal Court (ICC) alongside any future bodies tasked with addressing the crimes committed under Israel's genocide and ecocide of Palestinians.

Military Occupation 1948 to Present Day

Israel's founding and its apartheid regime on stolen and occupied Palestinian land is sustained through ever-expanding military expenditure.

¹¹ <https://www.common-wealth.org/publications/less-war-less-warming-a-reparative-approach-to-us-and-uk-military-ecological-damages>

¹² <https://pchrgaza.org/children-are-direct-victims-of-genocide-in-the-gaza-strip-pchr-confirms-2/>

¹³ <https://pchrgaza.org/pchr-issues-new-report-severed-bodies-shattered-souls-women-in-gaza-victims-of-genocide/>

¹⁴ <https://irishpages.org/product/genocide-in-gaza/?v=7885444af42e>; <https://www.icj-cij.org/node/203447>; <https://www.icc-cpi.int/defendant/netanyahu>; <https://www.amnesty.org/en/documents/mde15/8668/2024/en/>; https://www.btselem.org/publications/202507_our_genocide



According to the Stockholm International Peace Research Institute (SIPRI), the total military expenditure of Israel from 1948 to 2024 is US\$932 billion (in constant 2023 US\$).¹⁵

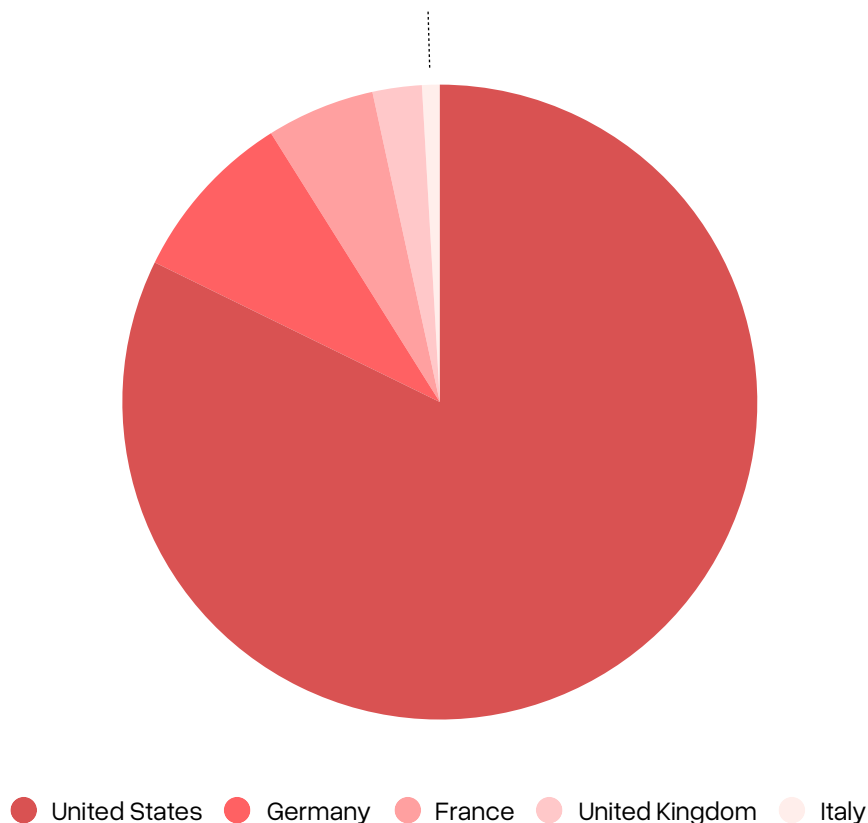
We estimate the corresponding military carbon footprint to be 362,000,000 tCO₂e (362 MtCO₂e).¹⁶

The (SCC) climate cost is therefore US\$93 billion. Let's break down the shares next.

ISRAEL'S WEAPON SUPPLIERS

For decades, the Israeli military has been heavily dependent on its Western allies for aircraft, guided bombs and missiles. These states must be recognized as active enablers of apartheid and genocide.

Main Suppliers of Arms to Israel (1950–2024)



Source: SIPRI Database¹⁷

¹⁵ <https://milex.sipri.org/sipri>

¹⁶ We assumed average military personnel of 172,000 and around 37% of military expenditure spent on major military equipment, and ignored the historical variation of carbon intensity of every dollar spent for this analysis (due to lack of relevant data).

¹⁷ <https://www.sipri.org/databases/armstransfers>



The United States has been the predominant supplier, accounting for 82% of Israel's military imports. Germany, France, UK and Italy supply the rest, accounting for 8.8%, 5.5%, 2.5% and 0.9% respectively. They all share responsibility for Israel's crimes against the Palestinian people since they collectively enable the Israeli military to conduct their military operations and aerial bombing campaigns.¹⁸ All but one of the Israeli Air Force's current manned aircraft are made in the USA.¹⁹

*"Germany & the United States supply 99% of the weapons exported to Israel. They could end this conflict overnight by stopping the weapons that kill Palestinians."*²⁰

*Professor Ben Saul,
UN Special Rapporteur on the Promotion and Protection of Human Rights while
Countering Terrorism*

ISRAEL'S WEAPONS SUPPLIERS'—SHARES OF MILITARY EMISSION CLIMATE COSTS

The United States provides approximately \$3.3 billion a year as grants under the Foreign Military Financing (FMF) program, funds that Israel must use to purchase U.S. military equipment and services.²¹ This annual FMF represents around 16% of Israel's defence budget so we will use this as the basis to calculate the shares of responsibilities for Israel's military emission SCC:

	SCC Climate Cost, US\$ billion	Share, %
Israel	74.9	80
USA	14.9	16
Germany	1.6	1.76
France	1	1.1
UK	0.5	0.5
Italy	0.17	0.18
TOTAL	93	100

¹⁸ <https://www.newarab.com/news/israel-unable-sustain-gaza-war-without-us-weapons-official>

¹⁹ <https://www.timesofisrael.com/amid-arms-embargo-calls-data-shows-99-of-israeli-weapon-imports-are-from-us-germany/>

²⁰ <https://www.yahoo.com/news/un-experts-criticize-germany-us-151224667.html>

²¹ <https://www.cfr.org/article/us-aid-israel-four-charts>



Despite Israel's long-standing drive for self-reliance and a booming domestic arms industry (accounting for 10% of national industrial production and 8% of total exports), the Israeli military is heavily and critically reliant on arms supplied by its Western allies.²² They must be seen for what they are: willing accomplices in the atrocities of Israel's apartheid regime.

The major arms suppliers to Israel, the USA, Germany, France, the UK, and Italy each share 16%, 1.76%, 1.1%, 0.5%, and 0.18%, respectively, of the social cost of carbon associated with Israel's military spending.

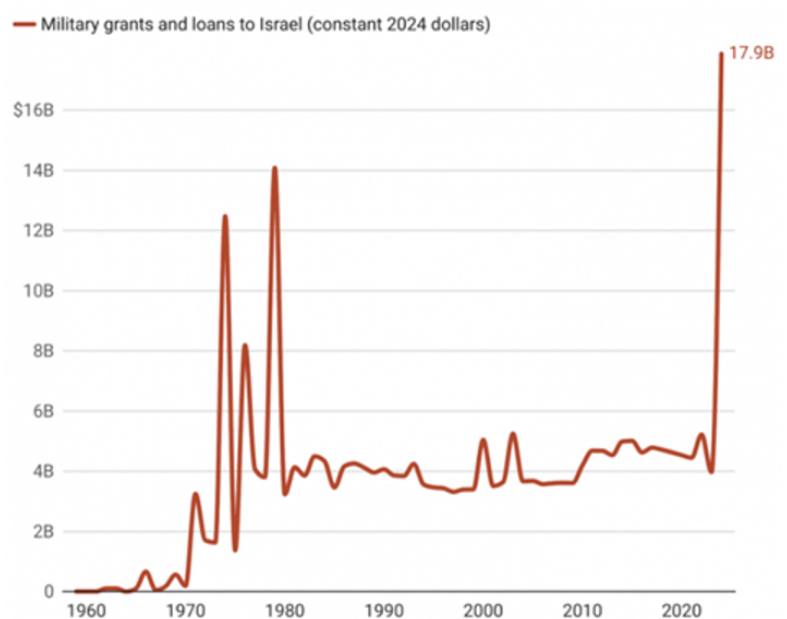
Of the estimated US\$93 billion climate cost of Israel's military expenditure since 1948, **Israel is responsible for US\$74.9 billion; the USA, Germany, France, the UK and Italy each are responsible for US\$14.9 billion, US\$1.6 billion, US\$1 billion, US\$0.5 billion and US\$0.17 billion, respectively.**

USA Military Aid to Israel

The USA is by far the biggest supplier of military aid to Israel. According to an analysis by Brown University's Watson Institute for International and Public Affairs, the US government has provided \$22.76 billion in military aid to Israel since the conflict began on October 7, 2023, to September 30, 2024. This funding includes \$17.9 billion for direct military assistance and \$4.86 billion for Israel assistance operations in the region.

Between 1959 and 2024, adjusted for inflation, total US military aid to Israel stands at US\$251.2 billion.²³

U.S. military aid to Israel, 1959–2024



Data: USAID Overseas Loans and Grants, Congressional Research Service, P.L. 118-47, P.L. 118-50. Figures adjusted using GDP deflator. Years are fiscal years. More: watson.brown.edu/costsofwar
Chart: Stephen Semler (@stephensemier) • Created with Datawrapper

²² <https://www.tandfonline.com/doi/full/10.1080/14702436.2025.2472720>

²³ <https://watson.brown.edu/costsofwar/papers/2024/USspendingIsrael>



The USA is by far the largest provider of military aid to Israel, supplying Israel with a total of \$3.8 billion in 2020 as part of a record \$38 billion, 10-year period agreement signed under former US President Barack Obama in 2016. Previously, Israel also received substantial US economic aid in addition to military supplies. However, as Israel's economy expanded, this economic aid, which began in 1951, was gradually phased out and nearly eliminated by 2007.²⁴

Today, U.S. security assistance to Israel takes many forms, but the most significant portion comes through **Foreign Military Financing (FMF)**, which consists of grants (or loans) used to acquire “US defence equipment, services and training”. Under a 2023 Memorandum of Understanding, the United States committed to providing US\$3.3 billion in annual FMF to Israel. This was equivalent to roughly 16% of Israel's defence budget.²⁵

Since US military aid is only for procurement of military equipment, services and training, we assume 100% allocation to “proportion spent on equipment” in our military carbon footprint formula. On this basis, the total US military aid to Israel of US\$251.2 billion has generated an estimated 181 MtCO₂e of GHG emissions.

The additional climate cost of this amount of GHG emissions is US\$46.7 billion.

	SCC Climate Cost, US\$ billion	Share, %
Israel	23.4	50
USA	23.4	50
TOTAL	46.7	100

As the saying goes, *it takes two to tango*. The U.S.–Israel military aid relationship is mutually reinforcing, wherein the U.S. funding sustains Israeli military capacity, and Israel provides a critical market and geopolitical underpinning for the U.S. in the region. Accordingly, we consider that they share equal responsibility for the resulting climate costs, each owing US\$23.4 billion for their share.

Conflict–Related Emissions

Gaza has endured several major Israeli military onslaughts, including Operation Cast Lead (2008–09) and Operation Protective Edge (2014), during the years of siege preceding the

²⁴ <https://www.aljazeera.com/news/2021/6/4/infographic-what-you-need-to-know-about-israels-military>

²⁵ <https://www.stimson.org/2023/in-shadow-of-war-a-snapshot-of-u-s-military-assistance-to-israel/>



current genocide. During each assault, Israeli forces repeatedly deployed “disproportionate force” to impose “collective punishment” on civilians.²⁶

However, we currently do not have estimates of conflict-related emissions for these earlier attacks.

The current ongoing genocide, however, has been nothing less than catastrophic in scale. Israel’s bombardment has completely flattened Gaza,²⁷ creating more than 36 million metric tonnes of debris from buildings destroyed and damaged. It would take as long as four decades to remove and process.²⁸ Recent research estimates the emission burden of Israel’s genocide on Gaza from October 2023 to January 2025 at 32 MtCO₂e. This figure includes emissions from direct war activities and pre- and post-conflict related construction.²⁹ Notably, 30% of GHG emissions from direct war activities since the war began are linked to U.S. transfers of over 50,000 tonnes of weapons and supplies to Israel.

The climate cost for the current Gaza genocide is around US\$8.3 billion.

The share of the U.S. is 30% and hence US\$2.5 billion.

According to SIPRI, 99% of arms imports for Israel between 2019 and 2023 came from the USA (69%) and Germany (30%). Therefore, Germany’s share of the climate cost would be 13%, amounting to US\$1.1 billion.

Israel bears chief responsibility for the genocide and its climate-related costs and should pay US\$4.7 billion. But its allies are complicit through their arms exports and logistical support.

	SCC Climate Cost, US\$ billion	Share, %
Israel	4.7	57
USA	2.5	30
Germany	1.1	13
TOTAL	8.3	100

²⁶ https://www2.ohchr.org/english/bodies/hrcouncil/docs/12session/A-HRC-12-48_ADVANCE2.pdf

²⁷ <https://www.independent.co.uk/tv/news/gaza-strip-israel-bombardment-occupation-aerial-video-b2802746.html>

²⁸ <https://iopscience.iop.org/article/10.1088/2634-4505/adeadc>

²⁹ <https://dx.doi.org/10.2139/ssrn.5274707>



Total Climate Costs

Across occupation-related, military-aid-related, and conflict-related categories, the total estimated **military and conflict-related climate reparations** owed by Israel and its allies to the Palestinian people since the Nakba amount to **US\$148 billion**.

Of this, Israel is responsible for US\$103 billion, the U.S. is responsible for US\$40.8 billion, Germany for US\$2.7 billion, France for US\$1 billion, the UK for US\$0.5 billion, and Italy for US\$0.17 billion.

	SCC Climate Costs, US\$ billion
Israel	103
USA	40.8
Germany	2.7
France	1
UK	0.5
Italy	0.17
TOTAL	148

For nearly two years, Israel's genocide in Gaza has had devastating consequences: at least 60,000 people have been killed, hundreds of thousands more injured, wounded, or buried under rubble. The civilian casualty rate of this genocide far outstrips all other modern wars.³⁰ In the West Bank, Israel has escalated its illegal settlement expansion, killing and displacing countless more Palestinian people. Environmental obliteration also unfolds in many forms: the flattening of infrastructure and toxic debris, scorched croplands, poisoned soils and aquifers, and the sea turned into sewage. The systematic destruction of ecosystems and life-supporting systems is not collateral damage, but a deliberate policy that makes lives unliveable. It is an act of ecocide that works in tandem with genocide to erase both a people, their culture, and their land. The carbon footprint of this ongoing genocide alone was estimated at 32 MtCO₂e, more than the combined annual GHG emissions of Costa Rica and Estonia.³¹ This underscores that the destruction is not only a humanitarian catastrophe but also a planetary one.

Our calculations estimate US\$148 billion in climate reparations owed by Israel and its allies since the Nakba. **Yet this is only a measurable entry point.** A full account of climate reparations must also reckon with the broader violences of ecocide and occupation, including but not limited to the theft of water, the obliteration of seed banks, the uprooting

³⁰ <https://theconversation.com/gaza-civilian-death-toll-outpaces-other-modern-wars-263685>

³¹ <https://www.theguardian.com/world/2025/may/30/carbon-footprint-of-israels-war-on-gaza-exceeds-that-of-many-entire-countries>



of native flora, and the enclosure and weaponisation of nature which sustains life, such as land, water, forests, and seeds.

4. Conclusion and Recommendations

There must be an immediate end to Israel's genocide in Gaza and an end to Israel's illegal military occupation and apartheid in Gaza and the West Bank, including East Jerusalem, as demanded by the International Court of Justice and the UN General Assembly. The need for consistent and concrete pressure is urgent, as Israel openly states its aim to entirely destroy Gaza. Accountability must extend beyond Israel to those states that enable its crimes through arms transfers, technological provisions, financing, and diplomatic cover.

Israel's genocide against Palestinians in Gaza and crimes against humanity³² will be made accountable.

Recommendations/Demands

- Recognise ecocide as the fifth international crime to be prosecuted by the International Criminal Court alongside genocide, war crimes, crimes against humanity, and aggression.
- Integrate military-linked climate harms into war crime tribunals and ensure that future investigations of Israel's genocide also include climate and ecological harms as part of the accountability process.
- Recognise Palestinian resource sovereignty and rights over natural resources in reparation frameworks.
- International institutions charged with adjudicating war crimes and reparations to ensure that military- and conflict-related emissions are incorporated into the reparations framework, building on the US\$148 billion calculated in this briefing.
- The FRLD (Fund for Responding to Losses and Damages), as well as all climate adaptation finance providers, must recognise the long-term and often irreversible impacts of ecocide and put in place mechanisms for victims of ecocide to access climate finance. Additionally, needs-based assessments of climate finance and the scale of pledged climate finance should account for the finance required as reparations and for rehabilitation resulting from military-induced climate harms.

³² <https://irishpages.org/product/genocide-in-gaza/?v=7885444af42e>; <https://www.icj-cij.org/node/203447>; <https://www.icc-cpi.int/defendant/netanyahu>; <https://www.amnesty.org/en/documents/mde15/8668/2024/en/>; https://www.btselem.org/publications/202507_our_genocide



- The UNFCCC must explicitly recognise the climate and ecological dimension of war and occupation. In particular, the Intergovernmental Panel on Climate Change (IPCC) AR7 Special Report on Cities should include a dedicated chapter on war- and conflict-related emissions, with attention to the wholesale destruction of cities and systems such as Gaza City and its surrounding lands.

Israel and its supporters' actions constitute both genocide and ecocide, as an act of destruction of people and the environment upon which survival depends. Climate justice requires that reparations account for both the measurable carbon costs and the deeper ecological, cultural, and social destruction that no metric can fully capture.