Nuclear Weapons, the Climate and Our Environment

Working towards a just, sustainable and peaceful future

Produced by Don’t Bank on the Bomb Scotland

August 2020
About Don’t Bank on the Bomb Scotland

Don’t Bank on the Bomb Scotland is a network of organisations that campaigns for Scottish banks, pension funds and public bodies to divest from companies involved in the production of nuclear weapons. Our member organisations are partners of the International Campaign to Abolish Nuclear Weapons.

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INTRODUCTION AND EXECUTIVE SUMMARY

Don’t Bank on the Bomb Scotland has been campaigning for Scottish organisations to divest from nuclear weapons companies since 2015.1 We focus on the nuclear weapons industry because we seek to disrupt the production and development of the most indiscriminate and destructive weapons in existence.

Any use of nuclear weapons would have devastating humanitarian and environmental consequences. A large-scale nuclear war would trigger a “nuclear winter” that would threaten the very survival of the human race (see section 3.3).

But we recognise that nuclear weapons are not the only existential threat facing humanity.

Our planet is now on average 1.1 °C hotter than it was in pre-industrial times as a result of greenhouse gas emissions caused by human activity. The effects of this heating are already causing humanitarian crises (see section 1.1). If we do not make “rapid, far-reaching and unprecedented changes in all aspects of society” to keep the global average temperature increase within 1.5°C, we will face more frequent extreme weather events, rising sea levels that will displace millions and a drastic increase in food insecurity.2

Current global heating projections indicate that the world could be heading for an average temperature increase of 4 °C by 2100, a scenario that could bring about the end of human civilisation. Other environmental consequences of human activity, such as species extinction, biodiversity loss, deforestation and soil degradation,3 threaten our future too.

The burning of fossil fuels is the single biggest contributor to greenhouse gas emissions and therefore a key driver of climate change. For this reason, Don’t Bank on the Bomb Scotland argues that Scottish financial institutions and public sector organisations must divest from companies that extract, produce or sell fossil fuels, as well as those that produce nuclear weapons.4

Beyond the existential threat that both the climate emergency and nuclear weapons present, the issues intersect in a number of ways. This report gives an overview of some of the connections.

Nuclear weapons won’t stop the climate crisis

Nuclear weapons serve no legitimate military purpose and cannot defend against the most serious threats to human security, such as climate disruption, terrorist attacks and pandemics (the COVID-19 crisis is discussed in section 1.3). Moreover, nuclear weapons divert money and skills away from initiatives that do actually address these threats.

In section 1.2.1 we show that nuclear-armed nations, including the US and the UK, spend more on weapons of mass destruction every year than they provide to developing nations in the form of climate finance.

We argue in section 1.2.3 that any Green New Deal plans should include a transition away from military production, as well as a transition away from fossil fuels.

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1 See https://nukedivestmentscotland.org/.
Nuclear competition detracts from dealing with the climate emergency

At a time when nations should be cooperating on tackling the climate crisis, nuclear weapons states are becoming increasingly competitive. Vast sums of money are being spent on the “modernisation” of nuclear warheads, their delivery systems and delivery platforms.

This new arms race increases the risk of climate-related conflict involving nuclear weapons. This is explored in section 2, with a focus on Asia and the Arctic.

Nuclear weapons cause environmental devastation

Just one nuclear weapon can destroy a whole city. We use NUKEMAP modelling in section 3.3.1 to show that a nuclear bomb detonated in the centre of Glasgow would kill nearly 80,000 people and spread radioactive fallout over a large area of Scotland. In section 3.3.2 we explain how a nuclear war would cause environmental devastation far beyond the war zone and alter the global climate.

But nuclear weapons cause untold environmental harm, regardless of whether or not they are used in conflict. Where the environment is degraded, people suffer, as case studies in sections 3.1 and 3.2 show.

Uranium mining, plutonium production and nuclear weapons testing have contaminated our air, land and water with harmful radioactive particles. This contamination has rendered the worst-affected areas unsafe for human habitation, poisoned marine eco-systems, deprived communities of access to key natural resources and caused serious health problems in local people.

Nuclear and climate injustices are connected

Indigenous people and people of colour have been disproportionately affected by nuclear weapons activities as a result of the nuclear colonialism of major powers. In many cases, these states have refused to acknowledge responsibility for the harm caused by uranium mining and nuclear weapons testing and have paid little or no compensation to those affected.

These injustices are paralleled by the injustices of climate change, as section 3.2 shows. The lives of Indigenous people and people of colour were deemed to be expendable by states seeking power and status through the development of nuclear weapons. Now millions of people in the Global South are being left to the mercy of climate disruption in order to maintain an economic system that amasses wealth and power for a small minority.

Countries of the Global North grew rich through industrialisation that was powered by the burning of fossil fuels. European countries and the US are responsible for half of the carbon dioxide emitted since 1750.

Developing nations are now being disproportionately impacted by a climate crisis that they did not cause. In some instances, communities that bore the brunt of nuclear weapons testing are now the most at risk from weather-related disasters and rising seas (see the case studies on the Marshall Islands and Kiribati in section 3.2).

In order to limit further global heating and avert the worst-case climate scenario, all nations must transition to low-carbon economies. That means, among other measures, ending the extraction and burning of fossil fuels, switching to renewable forms of energy and moving away from industrial

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5 For an overview of the health hazards associated with exposure to radionuclides see: [https://www.ctbto.org/nuclear-testing/the-effects-of-nuclear-testing/general-overview-of-the-effects-of-nuclear-testing/page-3-general-overview/](https://www.ctbto.org/nuclear-testing/the-effects-of-nuclear-testing/general-overview-of-the-effects-of-nuclear-testing/page-3-general-overview/).
6 “Around the world, victim assistance comes up short” (ICAN): [https://www.icanw.org/around_the_world_victim_assistance_comes_up_short](https://www.icanw.org/around_the_world_victim_assistance_comes_up_short).
agriculture. More fundamentally, it means abandoning an economic model that depends on over-consumption and infinite growth.

Change of this nature is threatening to those who have grown rich and powerful from the current system. This elite minority “has a stranglehold over our economy, our political process, and most of our major media outlets” and has thus been able to influence the form that climate action has taken. The result has been measures, like emissions trading schemes and carbon offsetting, that fail to address the root causes of climate change.

Developed nations have also resisted the developing world’s calls for climate justice. That would mean cutting carbon emissions at a faster rate than developing nations and providing compensation to those nations for the loss and damage caused by the climate emergency. In other words, “business as usual” has continued; carbon emissions hit a new high in 2018.

This elite power is backed up by force. Militaries are used to exert control over natural resources, such as fossil fuels, and to open up new markets. Arms are sold to repressive regimes and used to quell movements that demand political and economic reform. Nuclear weapons are used to project power over other nations and maintain the unjust and unsustainable international order.

Militarism and its ultimate manifestation – nuclear weapons – are thus an impediment to climate justice.

Challenging power, creating change

Don’t Bank on the Bomb Scotland believes that it is crucial to highlight the connections between climate change, nuclear weapons, militarism, environmental destruction, racism, gender inequalities and social injustice in order to build a broad-based movement that can challenge existing power structures and bring about systemic change.

The economic and social outcomes of the COVID-19 crisis have underscored the need for a radical transformation of our economies (see section 1.3). In the concluding section, we highlight an example of how many different organisations are coming together in the wake of the pandemic to demand that the Scottish government implement an economic recovery that puts people and planet before profit.

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1. NUCLEAR WEAPONS DIVERT RESOURCES FROM THE CLIMATE EMERGENCY

1.1 Human security impacts of climate disruption

Climate disruption presents an urgent, worldwide threat to human security. Higher temperatures, rising seas and extreme weather events are impacting food and water supplies, contributing to the displacement of large numbers of people and fuelling conflict. If global heating is left unchecked, these effects will worsen dramatically.

The number of climate-related disasters, such as heatwaves, droughts, cyclones, floods and storms, has nearly doubled since the 1990s. The Internal Displacement Monitoring Centre estimates that 16.1 million people were displaced by weather-related disasters in 2018. It is likely that the climate emergency will increase the frequency of these disasters, displacing millions more.

Climate disruption is one of the key drivers of hunger, according to the United Nations. Extreme weather events impact freshwater resources and agricultural productivity, causing food scarcity and food price increases in some regions. Modelling by the UK Met Office and the UN’s World Food Programme shows how dramatically food insecurity will increase in Central and South America, Africa, the Middle East and Asia if the rest of the world fails to drastically reduce carbon emissions and if developing countries do not receive adequate adaptation assistance.

**Figure 1: Food insecurity and climate change**

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14 “Food insecurity and climate change” (Met Office and World Food Programme): https://www.metoffice.gov.uk/food-insecurity-index/.
A reduction in the availability of nutritious food will increase the number of people suffering from malnutrition and under-nutrition, the World Health Organisation warns. Changing rainfall patterns and floods will impact the availability of fresh, clean water, leading to more cases of diarrhoeal disease and insect-borne diseases like malaria. The WHO estimates that climate disruption will cause 250,000 deaths a year by 2030.\(^\text{15}\)

The effects of climate disruption compound existing social and economic problems, such as poverty, inequality and disenfranchisement, creating the conditions for conflict. In Laikipia County, Kenya, for example, pastoralists and farmers have clashed after unusually long dry seasons led to water shortages that exacerbated existing tensions around land rights.\(^\text{16}\)

There is a broader risk that climate disruption will increase competition for resources within states where people already struggle to get their basic needs met, potentially leading to unrest and civil war.\(^\text{17}\) Some analysts argue that prolonged drought in Syria contributed to a mass displacement of people from rural to urban areas, and this in turn contributed to the outbreak of civil war in the country in 2011.\(^\text{18}\)

While those living in developing nations are at higher risk, the populations of rich countries will not escape the impacts of climate change. Within those nations, poor, vulnerable and marginalised groups will be worst affected.

It is estimated that 70,000 mainly older and poorer people\(^\text{19}\) died as a result of extreme heat in Europe in 2003, while drought caused crop shortfalls in several European nations. A number of deadly heatwaves have affected the continent since then and scientists believe that climate change has made their occurrence five times more likely.\(^\text{20}\)

In 2019-2020, bushfires raged for months in Australia, destroying nearly 3,000 homes and bringing hazardous levels of air quality across major cities. During the same period, high levels of rainfall caused flooding across England, leading to widespread evacuations and power cuts.

\(^\text{15}\) World Health Organisation factsheet on climate change and health (February 2018): [https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health].


\(^\text{17}\) See eg MB Burke et al, “Warming increases the risk of civil war in Africa” PNAS December 8, 2009 106 (49) 20670-20674: [https://doi.org/10.1073/pnas.0907998106] and SM Hsiang et al, “Quantifying the Influence of Climate on Human Conflict”, Science 13 Sep 2013: Vol. 341, Issue 6151, 1235367: [https://doi.org/10.1126/science.1235367].


\(^\text{19}\) J-M Robine et al, “Death Toll Exceeded 70,000 in Europe During the Summer of 2003” C R Biol, 331 (2), 171-8, Feb 2008: [https://doi.org/10.1016/j.crvi.2007.12.001].

1.2 Militarism warps spending priorities

Guns and bombs will not stop climate chaos, yet the UK government spends nearly three times more on the military every year than it spends on climate change measures and the protection of the natural environment.\(^{21}\)

**Figure 2: Annual UK government military and climate spending**

![Bar chart showing UK Government spending with categories for current military expenditure, current climate change and nature expenditure, and required climate change and nature expenditure.]

This spending reflects the tendency of governments to view security in terms of the security of the state, rather than the security of human beings. Policies are thus geared towards advancing “national interests” defined by the political establishment, including corporate business interests and UK ‘world power’ status.\(^{22}\) The focus is on defending borders, securing access to resources and maintaining an international economic system that is favourable to British companies. This requires a strong military, it is assumed, with access to a sophisticated array of weaponry and the ability to project power over other nations.

Within this patriarchal paradigm, the most powerful weapons of all – nuclear weapons – are promoted as the ultimate guarantee of security. The result is that vast amounts of resources are directed towards the production and maintenance of weapons of mass destruction, instead of towards measures that address human security threats.

1.2.1 International climate finance

Rich nations are disproportionately responsible for causing the climate crisis due to their historically high levels of carbon emissions,\(^{23}\) but developing nations are more vulnerable to the impacts of the crisis. Climate finance is financing from public and private sources that is provided by developed nations to developing nations to help those nations reduce carbon emissions and adapt to the effects of climate change.

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\[^{23}\] H Ritchie, “Who has contributed most to global CO\(_2\) emissions?” (Our World In Data, 1 October 2019): [https://ourworldindata.org/contributed-most-global-co2](https://ourworldindata.org/contributed-most-global-co2).
Developed nations promised to make US$100 billion in public and private climate finance available to developing nations by 2020. This commitment has not been met and the latest figures suggest that nine nations spend more public money on nuclear weapons every year than all the world’s developed nations are providing to the developing world in the form of public climate finance.

The Organisation for Economic Co-operation and Development reports that developed nations provided US$54.5 billion in public climate finance in 2017. Figures for the last two years are not available yet but previous annual increases suggest that the figure will have increased to approximately US$66 billion in 2019. Meanwhile, the International Campaign for the Abolition of Nuclear Weapons (ICAN) estimates that the world’s nuclear-armed nations together spent US$73 billion their nuclear forces in 2019. This figure is set to increase further in the coming years as these nations upgrade their nuclear weapons systems (see section 2.1).

The UK government has committed to spending £2.3 billion a year on international climate finance for five years starting in 2021. During this period, the annual cost of the UK’s military nuclear programme will be approximately £7.4 billion per year. That means that during the last decade that the world has left to avert climate catastrophe, the UK will spend three times more on its military nuclear programme than it will spend on international climate finance (see figure 3).

Figure 3: Comparison of UK’s annual spending on international climate finance and military nuclear programme (2021-2026)

24 This commitment was agreed at the 2009 United Nations Climate Conference (the Copenhagen Summit) and reaffirmed at the 2015 United Nations Climate Conference in Paris.


26 Between 2013 and 2017, public climate finance increased by an average of 9.8% a year: OECD op cit note 25.


29 Calculated using ICAN’s methodology (op cit note 27), ie annual nuclear operating costs plus “Defence Nuclear Enterprise” (DNE) equipment and support costs (note: this includes costs related to the UK’s nuclear-powered attack submarines, as well as the new nuclear armed Dreadnought submarines). The annual nuclear operating costs in 2020-21 will be £2.4 billion (see I Davis, “How much does the UK spend on nuclear weapons?” https://www.basicint.org/wp-content/uploads/2018/12/How-much-does-the-UK-spend-on-nuclear-weapons_-Web.pdf (BASIC, November 2018)). The National Audit Office estimates that DNE costs will be £50.9 bn between 2018 and 2028 which works out at £5 billion a year on average. £2.4 bn + £5 bn = £7.4 bn. For alternative methodologies used to calculate the cost of the Trident successor programme over its lifetime, see D Cullen, “Trouble ahead: risks and rising costs in the UK nuclear weapons programme” (NIS, April 2019): https://www.nuclearenfo.org/article/nis-reports/new-report-trouble-ahead and “The Costs of Replacing Trident” (CND): https://cnduk.org/wp-content/uploads/2018/02/Costs-2016-web.pdf.

30 IPCC op cit: see note 2.
The United States has emitted more carbon dioxide to date than any other country. The US is responsible for 25% of global historic emissions, which is twice more than the next largest national emitter, China. However, the US allocated just US$2.5 billion towards climate finance in its 2020 budget, a tiny fraction of the US$37.2 billion allocated to nuclear weapons (see figure 4). The country is set to spend upwards of US$1.2 trillion dollars maintaining and upgrading its nuclear arsenal over the next 30 years.

Figure 4: Comparison of US spending on international climate finance and nuclear weapons (2020)

If rich nations like the UK, US and France agreed to relinquish their nuclear arsenals, some of the money saved could be provided to developing nations in the form climate finance. This would provide a level of justice to nations that did not cause the climate crisis but are now bearing the brunt of its effects, including low-lying Pacific islands the Republic of Kiribati and the Marshall Islands which were devastated by the nuclear weapons testing of these three states (see section 3.2).

This action would also do more to promote international peace and security than any amount of spending on weapons. Nuclear disarmament would help to quell the interstate rivalry that is blocking action on the climate emergency (see section 2). The extra assistance provided to developing nations would leave them better able to cope with the challenges of global heating, such as disruption to food supplies caused by drought, and would thus reduce the risk of internal conflict and nation state collapse.

1.2.2 Transitioning away from fossil fuels and militarism

The UK must rapidly transition to a low-carbon economy if we are to play our part in limiting further global heating. This transition will require radical changes to the way that we generate power, build our homes, produce food and how we travel. The transition must be just, that is, it must not exacerbate existing social and economic inequalities and those who work in unsustainable industries must be supported into alternative employment.

A Green New Deal could deliver a Just Transition by providing a massive programme of public investment in renewable energy, green technologies and the development of sustainable practices. The aim would be to reduce carbon emissions and address other environmental threats, while creating quality jobs and tackling inequalities.

31 Our World in Data op cit: see note 23.
The production of nuclear weapons is energy intensive and generates vast amounts of toxic waste (see section 3.1). The British arms industry as a whole is a major greenhouse gas emitter and thus contributes to global heating.\(^\text{34}\) Furthermore, British arms exports fuel conflict and human rights abuses – bombs made in Scotland have been linked to alleged war crimes.\(^\text{35}\) Conflict impacts the natural environment in multiple ways\(^\text{36}\) and has been a key driver of species decline in protected areas.\(^\text{37}\)

Don’t Bank on the Bomb Scotland therefore argues that any Scottish or UK Green New Deal must include a shift away from military production towards sustainable and socially useful production (often called “defence diversification” or “arms conversion”). Scrapping the costly Trident renewal programme would be an obvious place to start, as the money spent on nuclear weapons could be reallocated towards Green New Deal measures.

**A Scottish Defence Diversification Agency**

Scotland’s SNP government supports the abolition of Trident but it is yet to get behind defence diversification in a meaningful way.\(^\text{38}\) If Scotland becomes independent from the rest of the UK, the Scottish government plans to evict Trident and retain Faslane as a conventional military base.\(^\text{39}\)

Don’t Bank on the Bomb Scotland believes that any decision about the future of the base should be taken as part of a reappraisal of Scotland’s defence needs within a human security framework; a military base is not the only option.

Several studies have shown how the skills currently employed on military projects in the Clyde region could be transferred to socially beneficial industries. A 2007 report by the Scottish Trades Union Congress and Scottish CND found that the manufacturing and research skills employed on Trident could be applied to the development of renewable energy technologies.\(^\text{40}\) A 2015 study by Campaign Against Arms Trade found that the Clyde region could be a centre for marine renewable industries.\(^\text{41}\) There are 6,000 arms industry workers in the region, including 2,250 at the Faslane nuclear submarine base. Among them are civil, marine, structural and mechanical engineers, as well as project managers, welders and divers, whose skills could be transferred to the wave and tidal power sectors.

The transition away from military production should be achieved as part of a process of industrial democratisation, whereby workers and communities would be given control over what is produced. This is the approach that the joint shop stewards committee at Lucas Aerospace, a major British military contractor, took in 1976. Faced with the prospect of job losses, the committee produced an “Alternative Corporate Plan” that detailed how the company could produce wind turbines, hybrid

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\(^{36}\) For a summary, see Conflict and Environment Observatory, “How does war damage the environment?” (4 June 2020): [https://ceobs.org/how-does-war-damage-the-environment/](https://ceobs.org/how-does-war-damage-the-environment/).


\(^{38}\) See eg L Pearson, “If the Scottish Government are serious about defence diversification they have to prove it” (CommonSpace, 20 February 2019): [https://sourcenews.scot/linda-pearson-if-the-scottish-government-are-serious-about-defence-diversification-they-have-to-prove-it/](https://sourcenews.scot/linda-pearson-if-the-scottish-government-are-serious-about-defence-diversification-they-have-to-prove-it/).

\(^{39}\) Defence policy is reserved to Westminster so the Scottish government does not currently have the power to remove Trident.

\(^{40}\) “Cancelling Trident: the economic and employment consequences for Scotland” (Report Commissioned by the Scottish Campaign for Nuclear Disarmament and the Scottish Trades Union Congress, March 2007).

car engines, kidney dialysis machines and other products.\textsuperscript{42} Lucas management rejected the plan but it continues to be recognised as a landmark defence diversification initiative.

The climate crisis has given new impetus to these ideas. In 2014, the Scottish Trade Union Congress (STUC) passed a conference resolution that called on the Scottish government to establish a Defence Diversification Agency, “whose main focus will be planning and resourcing the diversification of jobs away from defence projects, such as Trident, and promoting the greening of the Scottish economy”.\textsuperscript{43} This resolution was reaffirmed at the 2019 Congress.\textsuperscript{44} The STUC and the Scottish Campaign for Nuclear Disarmament have produced a joint report that outlines the role that the agency would play in conjunction with trade unions, community representatives and other state bodies, and the measures that would be required to avoid detrimental consequences for workers and communities during the transition.\textsuperscript{45}

At the UK level, major trade unions, Unite and the Public and Commercial Services Union (PCS), support defence diversification. In 2017, the British Trades Union Congress passed a motion calling for the Labour Party to establish a shadow Defence Diversification Agency.\textsuperscript{46}

\textbf{1.2.3 Divest and reinvest}

Don’t Bank on the Bomb Scotland argues that banks, pension funds and public bodies can play a role in the shift towards socially useful production through their investment decisions.

Despite widespread opposition to nuclear weapons in Scotland, our research shows that Scottish financial institutions, local authority pension funds, universities and the Scottish Parliamentary Pension Scheme have billions of pounds invested in companies that make nuclear weapons (see Table 1).\textsuperscript{47} Our campaign aims to persuade these organisations to adopt an investment policy that comprehensively prohibits financial involvement with nuclear weapons companies.

\begin{table}[h]
\centering
\begin{tabular}{|l|c|}
\hline
\textbf{Organisation} & \textbf{Total invested in nuclear weapons producers} \\
\hline
Lloyd's Banking Group (incl. Bank of Scotland) & £3.4 bn \\
RBS Group & £1.7 bn \\
Standard Life Aberdeen & £585 m \\
Scottish Local Government Pension Scheme & £321 m \\
Scottish Parliamentary Pension Scheme & £147,592 \\
Scottish Universities & £2.4 m \\
\hline
\textbf{Total} & £6 billion \\
\hline
\end{tabular}
\caption{Scotland's investments in nuclear weapons producers (2019)}
\end{table}

\textsuperscript{42} “Corporate plan – A contingency strategy as a positive alternative to recession and redundancies” (Lucas Aerospace Combine Shop Steward Committee, 1976) \url{https://www.dropbox.com/s/o2sqxhams2ywup/Lucas-Plan-53pp-alternative%20corporate%20plan.pdf?dl=0}.

\textsuperscript{43} Composite N, Trident and Defence Diversification (covering resolutions 91 and 92), STUC Congress: \url{http://www.stuc.org.uk/files/Policy/CongressDecisions/Congress2014.pdf}.

\textsuperscript{44} \url{http://www.stuc.org.uk/files/Policy/CongressDecisions/Congress2019.pdf}.


\textsuperscript{46} “TUC Congress calls for Shadow Defence Diversification Agency” (Labour CND, 15 September 2017): \url{http://www.labourcnd.org.uk/2017/09/tuc-defence-diversification/}.

Divestment stigmatises harmful activities and can affect the ability of companies to access financing, thus giving those companies an incentive to change their business strategies. Divestment also opens the way for money to be reinvested in socially beneficial industries, such as renewable energy or housing.\(^{48}\)

Divestment is therefore a powerful tool for effecting change. Don’t Bank on the Bomb’s website provides resources for people who wish to engage with organisations about their nuclear weapons investments, including template letters, briefing sheets and a model resolution for local councils.\(^{49}\)

Many of the banks and pension funds that we have researched also have investments in the fossil fuel industry. Friends of the Earth (FOE) Scotland has led efforts to persuade Scottish organisations to divest from fossil fuels, with some notable successes.\(^{50}\) We encourage anyone who wants to get active in this area to visit the organisation’s website and join a local FOE group.\(^{51}\)

### 1.3 Three lessons from the COVID-19 crisis

The 2020 COVID-19 pandemic has exposed the deep structural failings of our societies. Here we briefly summarise three lessons from the crisis that should inform economic recovery plans and any future initiatives aimed at economic transformation.

1. **Nuclear weapons don’t provide security**

The pandemic has highlighted the futility of high levels of military spending in the face of the most serious human security threats. In the UK, a shortage of critical care beds and ventilators has put doctors in the position of having to choose which patients will receive critical care.\(^ {52}\) Medical staff and care-home workers have been left to look after people suffering from the virus without adequate personal protective equipment, putting their own lives at risk.

On 1 April, three former Royal Naval Commanders and others wrote to MPs questioning the government’s decision to continue spending billions of pounds on nuclear weapons when “the increasing cost of Coronavirus will require decades to recover”. Former Polaris submarine Commander Robert Forsyth RN said: \(^ {53} \)

> “It is completely unacceptable that the UK continues to spend billions of pounds on deploying and modernising the Trident Nuclear Weapon System when faced with the threats to health, climate change and world economies that Coronavirus poses.”

Human security needs should determine government policies and priorities, not a perceived need to project power over other nations.

2. **Inequalities must be addressed**

COVID-19 has demonstrated how longstanding structural inequalities cause disparities in socioeconomic and health outcomes. Black and ethnic minority and people in England are up to

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\(^{49}\) [https://nukedivestmentscotland.org/template-letters-2/](https://nukedivestmentscotland.org/template-letters-2/).

\(^{50}\) [https://foe.scot/campaign/fossil-fuel-divestment/divestment-useful-resources/](https://foe.scot/campaign/fossil-fuel-divestment/divestment-useful-resources/).

\(^{51}\) [https://foe.scot/get-involved/local-groups/](https://foe.scot/get-involved/local-groups/).

\(^{52}\) P Foster, “NHS ‘score’ tool to decide which patients receive critical care” ([Financial Times](https://www.ft.com/content/d738b2c6-000a-421b-9dbd-f85e6b333684), 13 April 2020).

twice as likely as white people to die of the virus. In Scotland, England and Wales, people living in the most deprived areas have died at double the rate of those in more affluent areas.

The global economic downturn brought on by the pandemic has hit the poor and vulnerable the hardest. Loss of income has increased food insecurity for millions of people in the developing world and the World Food Program estimates that the number of people going hungry will double in 2020. In the UK, women are disproportionately employed in low-paid, insecure roles and are therefore more at risk of losing their income during the crisis than men.

The climate emergency will repeat this dynamic unless inequalities within and between nations are addressed. Millions of people in the Global South will be left without adequate food, water and shelter. Within developed nations, rising food and energy prices will impact the poor the hardest.

Ending militarism is crucial to ending inequality. Militarism reinforces structures of oppression and draws public resources away from social programmes that alleviate inequality. Women and people of colour have long understood this dynamic and made it a focus of anti-militarist action.

3. Defence diversification is possible

The COVID-19 crisis has shown that arms companies can switch to socially useful production. Key Trident contractors BAE Systems, Babcock and Rolls Royce were among the companies that began to make ventilators for the NHS following a request from the government in March. Rolls Royce has also produced thousands of face shields for frontline workers.

A common objection to scrapping Trident is that it would put highly skilled employees out of work. As CND pointed out, the rapid shift to ventilator production shows that this does not have to be the case.

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58 See eg Gender and militarism: Analysing the links to strategise for peace (Women Peacemakers Program, May 2014) and V Intondi, African Americans Against the Bomb: Nuclear Weapons, Colonialism, and the Black Freedom Movement (Stanford Nuclear Age Series, 2015).
2. Nuclear competition impedes international co-operation on the climate emergency and increases the risk of climate-related conflict

Militarism has played a significant role in creating the current climate emergency. Militaries have been used to facilitate fossil fuel extraction in resource rich regions. Militaries also have a massive carbon footprint.

The US Department of Defence is the world’s largest single institutional consumer of fossil fuels and one of the largest polluters in history. The carbon footprint of UK military spending was 11 million tonnes of CO₂ in 2017-2018, according to Scientists for Global Responsibility. This is equivalent to the annual emissions of six million cars.

Rampant militarism, in the form of nuclear weapons “modernisation”, is now increasing distrust between nations at a time when international co-operation on climate action is urgently required. Several states are developing new types of nuclear weapons while others are increasing the size of their nuclear arsenals and diversifying their delivery systems.

2.1 New nuclear arms race

The UK is replacing its nuclear warheads and building new nuclear submarines. France is spending €5 billion a year on new warheads, missiles and delivery platforms and President Macron wants the country’s nuclear arsenal to play a key role in Europe’s post-Brexit defence policy.

Russia is developing a new intercontinental ballistic missile (ICBM), the “Satan 2”, that President Putin claims will have “practically no range limits”, and a nuclear-powered, nuclear-armed, underwater drone. The “Poseidon” is designed to generate a radioactive tsunami, causing “areas of wide radioactive contamination that would be unsuitable for military, economic, or other activity for long periods of time”.

The US Navy has recently deployed a new low-yield, submarine-launched, nuclear warhead – the W76-2. The US is also developing a new air-launched nuclear cruise missile, the Long Range Stand Off Weapon, and a next generation ICBM, the Ground Based Strategic Deterrent. In May 2020, a...

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62 Calculated using the “consumption-based” approach which includes all emissions “that occur as part of the lifecycle of activities necessary to support [the UK military-industrial sector’s] consumption”. This approach does not include emissions related to UK overseas arms sales or emissions related to the use of weapons on the battlefield: SGR op cit (see note 34).


Nuclear Weapons, the Climate and Our Environment

special envoy of President Trump said that the US was prepared to spend its adversaries “into oblivion” in order to win the nuclear arms race.\(^6^9\)

China is deploying new nuclear-capable intermediate-range mobile ballistic missiles in large numbers\(^7^0\) and is reported to be developing new air-launched ballistic missiles. This would give the country access to the full triad of nuclear weapons delivery systems for the first time.\(^7^1\)

Russia, China and the US are also in a race to develop hypersonic weapons – conventionally or nuclear-armed missiles that are capable of travelling at more than 15 times the speed of sound.\(^7^2\)

Experts have warned that the deployment of these missiles could make nuclear weapons use more likely, as decision-makers will not have time to assess whether an incoming missile is armed with a nuclear or conventional warhead and may launch a nuclear strike in retaliation.\(^7^3\)

Meanwhile, arch-rivals India and Pakistan are expanding the size of their nuclear arsenals,\(^7^4\) while North Korea continues its testing of nuclear-capable missiles.

### 2.2 Increased risk of conflict

This new arms race has been accompanied by bellicose rhetoric from leaders\(^7^5\) and the demise of arms control agreements.\(^7^6\) Political analysis is awash with talk of a new Cold War and a new era of great power competition.

As the effects of climate change worsen, there is a risk that increasing interstate rivalry will push some nuclear-armed states towards conflict.

#### 2.2.1 Water issues in Asia

Water shortages could inflame existing inter-state tensions in Asia. Access to the Indus River has been a source of dispute between Pakistan and India in the past, while control over the Brahmaputra River has long caused friction between India and China. It is predicted that global heating will melt around a third of the mass of Himalayan glaciers that feed water into the Indus and the Brahmaputra.\(^7^7\) This will likely cause flooding initially but shrinking glaciers and reduced rainfall will ultimately cause water levels in both rivers to decrease.

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\(^{74}\) OB Toon et el, “Rapidly expanding nuclear arsenals in Pakistan and India portend regional and global catastrophe” Science Advances 02 Oct 2019: Vol. 5, no. 10, eaay5478: [https://doi.org/10.1126/sciadv.aay5478](https://doi.org/10.1126/sciadv.aay5478).


\(^{76}\) The US pulled out of the Joint Comprehensive Plan of Action (the Iran nuclear deal) in 2018, the Intermediate Range Nuclear Forces Treaty between the US and Russia was terminated in 2019 and the US announced that it would pull out of the Open Skies Treaty in May 2020. The last remaining arms reduction treaty between the US and Russia, NewSTART, in jeopardy.

Disquiet within India has grown in recent years over China’s dam building projects on the Brahmaputra. China completed construction of the Zangmu “mega dam” in 2014 and has plans to build more hydropower dams on the Brahmaputra.

Downstream in the Indian state of Assam, the Brahmaputra provides irrigation for tea plantations, while annual flood waters are crucial to agriculture and fishing. The Indian government has raised concerns with the Chinese government about dams reducing the amount of water flowing into India. These concerns are likely to be heightened if river levels are impacted by climate change, in a context of already deteriorating relations. In May and June 2020, deadly clashes took place between Indian and Chinese forces in a disputed Himalayan border area, which the nuclear-armed nations have previously fought a war over.

Water shortages would also add additional stress to India and Pakistan’s hostile relationship. Much of the tension between the neighbouring states centres on the disputed region of Kashmir. Until 2019, both India and Pakistan administered self-governing parts of the region. In early 2019, the two sides appeared to come close to war after a suicide bombing in the Indian-administered part of the region provoked border skirmishes and an exchange of air strikes. In August that year, India revoked the autonomy of Indian Kashmir, effectively annexing the territory.

Peace and security expert, Michael T Klare, believes that India may be seeking to dam the tributaries of the Indus that flow through Indian-controlled Kashmir. This would divert water away from Pakistan and “could easily trigger a war if it occurs at a time of severe food and water stress and one that would very likely invite the use of nuclear weapons”, Klare warns.

A nuclear war between India and Pakistan could kill millions and cause a climate catastrophe (see section 3.3.2).

2.2.2 Scramble for resources in the Arctic
The Arctic is another potential flashpoint for climate-related conflict. Rising temperatures are causing polar ice caps to melt at a rate that will lead to a 70 cm rise in sea levels by 2100. The is in line with the worst-case climate change scenario set out by the Intergovernmental Panel on Climate Change, which would see a global average temperatures rise of between 3 and 5.5°C above preindustrial levels, and would leave 400 million people exposed to coastal flooding every year.

However, major powers view the melting Arctic Sea ice as an opportunity. It is becoming easier to drill for resources in the region and a reduction in the amount of sea ice is opening up potential new shipping lanes. US Secretary of State Mike Pompeo expressed this bluntly at a meeting of the Arctic Council in May 2019.
Russia has led the scramble for resources in the region, investing heavily in oil and gas exploration. This has been accompanied by an increased military presence. The country has more than doubled the number of operational military bases that it has above the Arctic Circle since 2007 and has deployed advanced radar and missile defence systems along the Northern Sea Route.

China has invested in Russia’s Arctic oil and gas industry and has ambitions of its own in the region. China has defined itself as a “near-Arctic” state and in 2012 became the first country to send an icebreaker ship along the Transpolar Sea Route that runs across centre of the Arctic Ocean. China has identified the route as a major transportation corridor for its “Belt and Road Initiative”, a US$1 trillion development programme that aims to connect Asia with Africa and central Europe.

The US is striving to catch up. During his Arctic Council speech, Pompeo said that the country would strengthen its military presence in the region, rebuild its icebreaker fleet, increase funding for the US Coast Guard and create a new senior post for Arctic Affairs in the military. The US Department of Defense, Navy and Coast Guard have all issued Arctic strategy documents in recent years.

### 2.3 Cooperation not competition

Major powers are competing for commercial and military dominance of the Arctic when they should be agreeing measures to limit the amount of ice that will be lost. Militaries are being used to facilitate the extraction of fossil fuels from the region, which will only make global heating worse.

Moreover, militarisation of the region increases the risk that major-power competition will lead to conflict, which would likely draw in other states. In March 2020, thousands of British, Finnish, Swedish, Dutch, German, French and Danish troops joined Norwegian and US combat forces for NATO war games in Norway’s Arctic Circle. The “Cold Response” exercise simulated war with Russia but was abandoned due to the COVID-19 pandemic.

The expansion and enhancement of nuclear arsenals means that a conventional conflict between major powers could escalate into nuclear warfare. The deployment of new low-yield nuclear weapons like the W76-2 warhead is particularly troubling, as these weapons are designed to be used on the battlefield (a scenario that the US has actively considered).

Containing the climate emergency demands cooperation between nations. As Naomi Klein has written, “a worldview will need to rise to the fore that sees nature, other nations, and our own neighbours not as adversaries, but rather as partners in a grand project of mutual reinvention”.

Nuclear competition is taking the world in precisely the opposite direction.

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85 “Polar powers: Russia’s bid for supremacy in the Arctic Ocean” (Financial Times, 27 April 2019): https://www.ft.com/content/2fa82760-5c4a-11e9-939a-341f5ada9d40.


87 Ibid.


90 N Klein, This Changes Everything – Capitalism vs. The Climate (Penguin, 2014).
3. NUCLEAR WEAPONS DESTROY THE ENVIRONMENT AND THREATEN THE CLIMATE

This section examines the environmental and climactic consequence of nuclear weapons production, testing and use and the accompanying health impacts. Indigenous communities and women have been disproportionately harmed by nuclear weapons activities and have been at the forefront of anti-nuclear resistance since the beginning of the nuclear age.91

As these case studies illustrate, human beings are not separate from “the environment” but entirely dependent upon it for our existence. This should be a self-evident truth, however, it bears repeating at a time when the threat of nuclear weapons use is the highest it has been since the Cold War, when a major nuclear weapons state has considered a resumption of nuclear weapons testing (see section 3.2) and when there is lack of urgent action to tackle the climate emergency.

The activities described in this section release harmful radioactive particles into the environment that can remain toxic to people and animals for thousands of years.92 Long-term exposure to low doses of ionising radiation, as might be experienced by people living near a uranium mine or a nuclear fuel reprocessing facility, can change cells in the body and increases the risk that those exposed will develop cancer over their lifetime. Women are more likely to develop cancer due to ionising radiation exposure than men.93 Higher doses caused, for example, by exposure to fallout from a nuclear detonation will kill cells quickly. This causes radiation sickness that can be fatal within a short period of time.

Radioactive particles are most dangerous if they are inhaled or ingested, as the source of radiation is delivered directly to the body’s cells. Radioactive substances like caesium-137 can remain in soil for decades where they are absorbed by plants, leaving land unsafe for food-growing or grazing animals. Uranium mining and underground nuclear weapons testing has contaminated trillions of litres of fresh water with longer-lived radioactive isotopes which pose a risk to humans for thousands of years.

Radioactive racism

A strong current of racism runs through the case studies discussed in this section. Indigenous lands have been disproportionately targeted for nuclear weapons activities that have been carried out with scant regard for the health and wellbeing of Indigenous people.

A failure to respect Indigenous cultures that have long recognised and honoured complex human interdependencies with the natural world is another element of this racism. This is evident in both the development of nuclear weapons and the climate crisis.

92 CTBT op cit (see note 5).
3.1 NUCLEAR WEAPONS PRODUCTION AND DEPLOYMENT

Nuclear weapons use either highly enriched uranium or plutonium as fissile material. The steps involved in producing these materials (see figure 5) are energy intensive and create vast quantities of toxic waste.

Figure 5: Steps involved in producing fissile material for nuclear weapons

### Uranium enrichment route
- Uranium mining
- Uranium milling and refining (production of yellowcake)
- Processing (converting yellowcake into uranium hexafluoride)
- Enriching uranium hexafluoride to weapons grade (90% U-235) in centrifuges and diffusion plants
- Nuclear fuel manufactured and placed in nuclear reactors where weapons-grade plutonium (approximately 93% PU-239) is produced by neutron activation of U-238
- Reprocessing (separating the plutonium from spent fuel in a reprocessing plant)
- Fabrication (converting weapons-grade uranium hexafluoride to uranium dioxide powder and into metallic forms for use in fissile core of nuclear weapon)

### Plutonium production route
- Uranium mining
- Uranium milling and refining (production of yellowcake)
- Processing (converting yellowcake into uranium hexafluoride)
- Enriching uranium hexafluoride to reactor grade (approximately 3% U-235) in centrifuges and diffusion plants
- Fabricating of plutonium weapons components

Some of the processes discussed in this section (uranium mining, milling and refining, uranium enrichment and nuclear fuel reprocessing) are nowadays more commonly associated with the civil nuclear industry, yet the production of nuclear weapons and nuclear power are inextricably linked. The nuclear power industry grew out of the development of nuclear weapons and the technologies that are used to generate electricity can be used to produce the fissile material for nuclear bombs.

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94 “Fissile” means capable of sustaining a nuclear fission chain reaction.
95 A full discussion of the connections between the civil nuclear industry and nuclear weapons is beyond the scope of this report. For more see eg “Civilian nuclear power and nuclear weapons proliferation” (N2NP briefing, 2012):
Furthermore, military nuclear programmes and the civil nuclear power industry share a “large-scale national base of nuclear-specific skills, research, training, design, engineering, industrial and regulatory capabilities”. 96 Research by Prof Andy Stirling and Dr Phil Johnstone of the University of Sussex suggests that the need to maintain this base for military nuclear projects has been a factor in the UK government’s decision to champion nuclear power as a source of low carbon energy over cheaper, clean, renewable sources. 97 The perceived need of governments to continue a nuclear weapons programme is thus an obstacle to pursuing effective and sustainable climate change solutions.

3.1.1 Uranium mining and milling

Historically, most uranium has been mined using the open pit method. Rocks containing uranium ore are excavated, crushed and mixed with water to form a slurry. Uranium is then leached from this slurry using sulphuric acid or an alkaline solution (uranium milling) and processed to form yellowcake.

This form of mining and milling leaves behind thousands of tonnes of waste rock, as well as large quantities of highly radiotoxic “mill tailings” (radioactive and chemically toxic sludge produced in the milling process). These tailings are generally disposed of near the mine in tailing piles and tailing ponds and present a continuing risk of contamination to the local environment. Mining and milling also cause potentially dangerous radioactive particles to be released into the air.

Today, in-situ leaching is the most commonly used method for mining uranium. Holes are drilled in the uranium ore deposit and a leaching solution, either sulphuric acid or sodium hydroxide, is channelled into it. The solution is then pumped to the surface where the uranium is recovered and processed into yellowcake.

This method leaves behind less waste rock and avoids the need for large mill tailing deposits, however, it creates large amounts of toxic slurry and causes permanent groundwater contamination. Contamination from uranium mining has rendered billions of litres of water unusable in drought-stricken parts of the United States.98

Around 70% of uranium mining has been undertaken on Indigenous lands and the case studies here highlight the environmental racism upon which nuclear weapons are built.

Australia

Uranium mining activities in Australia date back to the early twentieth century. Uranium from Radium Hill in South Australia was used to produce the nuclear weapons that the UK tested on Aboriginal land in the 1950s and 1960s (see section 3.2.2).

97 Ibid. For Stirling and Johnstone’s report on industrial interdependencies between civil and military nuclear infrastructures at the international level see: http://sro.sussex.ac.uk/id/eprint/84067/1/2018_13_SWPS_Stirling_and_Johnstone.pdf.
A 1997 Australian Senate report detailed the devastating impact of uranium mining on Indigenous lands, including the destruction of sacred sites and widespread contamination. The report concluded that uranium mining operations had left some areas “so degraded that traditional owners are unable to use them”.

The Ranger Mine is situated on Mirarr land in the Northern Territory and surrounded by Kakadu National Park. There have been over 200 leaks and spills of toxic substances and breaches of licence conditions at the mine, which is operated by a Rio Tinto subsidiary, since it began operating in 1980. In 2009 it was revealed that tens of thousands of litres of contaminated water were leaking into Kakadu from a tailings dam every day. Studies have found that incidence of cancer among Aboriginal people in the Kakadu region are 90% greater than would be expected in comparison with other parts of Australia.

The Mirrar people prevented the opening of a new uranium mine, Jabiluka, at Kakadu in the early 2000s after mobilising thousands of people from across Australia in a long-running campaign of nonviolent civil disobedience. In many cases, however, uranium mining has been forced on Aboriginal communities against their will. In 2019, the Australian government gave approval for a new uranium mine in Western Australia despite strong opposition from the Tjiwarl traditional owners and evidence that the mine will lead to the extinction of native groundwater species.

Today, Australian uranium is exported “exclusively” for use in civilian nuclear reactors. However, these exports still present a proliferation risk as uranium enrichment plants can be used to produce weapons grade, as well as reactor grade, uranium.

In 2014, the Australian government agreed to sell uranium to India, breaking a long-standing policy against exporting to states that are not party to the Nuclear Non-Proliferation Treaty. Arms control experts have warned that Australian uranium could end up being used in the production of nuclear weapons, thereby fuelling the nuclear arms race between India and Pakistan.

**Navajo Nation, US**

The US began mining for uranium on Navajo Nation lands in the 1940s to support the Manhattan Project (the US’s nuclear weapons programme). During the period up to 1986, 27 million tonnes of uranium ore were extracted. Some of this uranium was used to produce the nuclear bombs that were detonated over the Japanese cities of Hiroshima and Nagasaki in 1945.

The worst leak of radioactive material in US history occurred on Navajo land at the Church Rock mine, New Mexico, in 1979. A tailings pond breached its dam, releasing 1,000 tonnes of solid radioactive mill waste and 360,000 cubic metres of liquid waste into the Puerco River. There is
The contaminated water killed livestock and crops and caused burns and infections in Navajo people who came into contact with it. A 2007 study found that some water sources were still contaminated.107

High rates of cancer, kidney disease and respiratory diseases among the Navajo have been associated with exposure to uranium, but there have only been limited studies into the health impacts of uranium mining in the region. In one such study, which is ongoing, a quarter of the Navajo women who have been tested and some babies have been found to have high levels of uranium in their system.108

### 3.1.2 Plutonium production

Plutonium is more commonly used in nuclear weapons because it is easier to produce than highly enriched uranium. All nuclear reactors convert uranium atoms to plutonium atoms. Weapons-grade plutonium is generally produced in military reactors, although some countries (including France and the UK) have used electricity-generating reactors to produce plutonium for weapons in the past. The plutonium is then separated from the reactor’s spent nuclear fuel rods using strong acids (reprocessing).

These processes release dangerous radioactive particles into the air and create vast quantities of high-level liquid nuclear waste. The end product – plutonium-239 – remains toxic for hundreds of thousands of years.

**Sellafield, UK**

The plutonium for the UK’s nuclear weapons programme was produced at Sellafield, Cumbria (formerly known as Windscale). The “Windscale Piles” (two air-cooled and open-circuit, graphite-moderated reactors) produced the first weapons-grade plutonium in the 1950s. The site also hosted

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The UK’s first nuclear power station, Calder Hall, which generated electricity that powered the site. However, Calder Hall’s primary purpose was to produce plutonium for military purposes.

Nuclear fuel reprocessing has been carried out at Sellafield since operations began, creating a stockpile of around 126 tonnes of plutonium. Reprocessing is set to end at the site by 2021 but this stockpile will continue to pose a proliferation risk, as it is enough plutonium to make tens of thousands of nuclear weapons. Large quantities of nuclear waste are stored at Sellafield too, including the used fuel from the nuclear reactors in the UK’s nuclear-armed submarines.

In 1957, a fire at the site burned for three days. Radioactive contamination spread across Europe and caused at least 240 cases of cancer. In 2016, a whistleblower warned that serious safety issues at Sellafield could lead to a similar incident.

Sellafield has discharged large quantities of radioactive materials into the Irish Sea, making it the most radioactively polluted marine environment in the world according to independent consultant, Dr Ian Fairlie. The Commission of the Convention for the Protection of the Marine Environment of the North-East Atlantic estimates that sub-tidal sediment within the Irish Sea contains 200 kg of plutonium.

In 2003 the UK government admitted that Sellafield has been a source of plutonium contamination after a study found the presence of plutonium in children’s teeth across the country, with more than twice the concentration in the teeth of children living close to the site.

3.1.3 UK’s nuclear warheads and submarines

Aldermaston

Large amounts of radioactive waste are generated by the production and maintenance of the UK’s nuclear warheads at the Atomic Weapons Establishment in Aldermaston. The site currently stores about four million litres of waste, according to Scientists for Global Responsibility, some of which is held in old, degraded containers.

The Office of Nuclear Regulation has placed the Aldermaston site under “special measures” since 2013 due to ongoing safety and compliance issues, including a leak of tritium gas into a stream.

117 For more details see SGR op cit (see note 34), p 84.
**Faslane**

The Faslane Naval Base in Argyll and Bute, Scotland, handles liquid nuclear waste from the reactors used to power the UK’s nuclear submarines, as well as solid waste from the nearby nuclear weapons depot at Coulport. After treatment, liquid waste is discharged into the Gare Loch; a sea loch that is popular for fishing, sailing and water sports.

In 2019, the Ministry of Defence (MoD) applied to the Scottish Environment Protection Agency (SEPA) for permission to build a new waste management facility at Faslane, as part of a plan that will see an increase in the amount of radioactive waste discharged into the loch.

The proposal has drawn condemnation from politicians, experts and civil society organisations. Nuclear Free Local Authorities says that the additional discharges “would result in increased radioactive contamination of the entire Gare Loch, including its flora and fauna, and would result in increased radiation doses to people living in the vicinity of the Loch”.

**Decommissioned nuclear submarines**

The UK’s nuclear submarines continue to present an environmental hazard long after they are taken out of service, as they contain spent nuclear fuel and large quantities of radioactive waste.

The MoD has failed to fully decommission any of the 20 nuclear submarines that have been taken out of service since 1980. The delay is due, in part, to the complexity and cost of the decommissioning process and the lack of a permanent disposal site for the submarines’ nuclear waste. At one stage, MoD officials considered dumping the submarines on the seabed off the West coast of Scotland in the hope that “everyone [would] forget about these submarines and that they [would] be allowed to quietly rot away indefinitely”.

It is estimated that the vessels – which are stored at Devonport dockyards, Plymouth, and Rosyth in Fife – still contain 4,500 tonnes of hazardous material. Storage has so far cost taxpayers more than half a billion pounds.

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121 Ibid. Twelve Scottish local authorities are members of Nuclear Free Local Authorities. See: https://www.nuclearpolicy.info/about/member-councils/.
124 SGR op cit (see note 34), pp 23–24.
125 NAO op cit (see note 122).
3.1.4 No solution for nuclear waste

Despite extensive research, a scientifically proven, safe and permanent method of disposing of the radioactive waste that is created during nuclear weapons and nuclear power production is yet to be established.\(^{126}\)

Several countries have plans to build deep geological repositories, where canisters containing the waste would be buried several hundred metres below the ground. However, there are significant uncertainties around the viability of this method.

Moreover, plans to build nuclear waste disposal facilities tend to run into opposition from local people. Understandably, communities are reluctant to host material that presents an environmental and health hazard for thousands of years. As a result, the search for permanent disposal site has stalled for years in several nations, including the UK.\(^{127}\)

In Australia, Aboriginal people have been fighting against nuclear waste dump proposals, at various locations, for two decades. The federal government is currently pressing ahead with plans for a facility at Napandee, near Kimba on the South Australian Eyre Peninsula, against the wishes of the Barngarla traditional owners.\(^{128}\)


3.2 NUCLEAR WEAPONS TESTING

Between 1945 and 1996, five countries carried out a total of 2,047 nuclear tests. The tests were conducted above ground (atmospheric testing), underground and underwater, with atmospheric testing accounting for most of the explosive yield released during the period.

According to the United Nations Scientific Committee on the Effects of Atomic Radiation, this atmospheric testing “resulted in unrestrained release into the environment of substantial quantities of radioactive materials, which were widely dispersed in the atmosphere and deposited everywhere on the Earth’s surface.” This had long-lasting and far-reaching environmental consequences. A recent study found that atmospheric changes caused by US and Soviet testing in the 1960s altered rainfall patterns in the Shetland Islands, thousands of kilometres from the test sites.

Cold War rivals, the US and Russia, were responsible for 85% of the tests conducted before 1996, with the remainder conducted by the UK, France and China. Since the Comprehensive Nuclear Test Ban Treaty (CTBT) opened for signature in 1996, 10 more tests have been conducted by India, Pakistan and North Korea.

The CTBT is yet to enter into force as eight states have failed to ratify the treaty, including the US.

In May 2020, reports emerged that US national security officials had considered a resumption of nuclear weapons testing, raising fears that the world will see yet more of the environmental and humanitarian devastation detailed in this section.

The UK, the US, and France chose to conduct some, or all, of their nuclear weapons testing far away from the “motherland” in areas deemed to be remote and insignificant. The Soviet Union conducted most of its testing in the Semipalatinsk region of Kazakhstan and at Novaya Zemlya, an archipelago in the Arctic Ocean occupied by the Indigenous Nenets.

As a consequence of this nuclear colonialism, Indigenous people and people of colour have been disproportionately impacted by nuclear weapons testing. The testing destroyed vast areas of land, poisoned water sources, severed cultural ties and left a legacy of serious intergenerational health problems. As the case studies in this section show, the injustices of nuclear weapons testing are now being compounded by the injustices of climate change.

“From the detonation of hundreds of nuclear bombs over vulnerable communities in the Pacific, to the disposal of hazardous radioactive waste on lands and territories of Indigenous peoples, the legacy of nuclear testing is one of the cruelest examples of environmental injustice witnessed.”

UN Special Rapporteur Baskut Tuncak on the 75th anniversary of the first ever nuclear weapons test – Trinity, 1945

133 The testing programmes of the US, UK and Soviet Union are discussed in this section. For an overview of the testing programmes of France and China see: https://www.ctbto.org/nuclear-testing/.
134 The CTBT requires ratification by 44 states listed in Annex 2 of the treaty before it can enter into force. Of these 44 states, the US, China, Egypt, Iran and Israel have signed but not ratified the Treaty while India, North Korea and Pakistan have not signed it.
3.2.1 US nuclear weapons testing

**Nevada**

Most of the US's nuclear tests were conducted at its Nevada Test Site, 105 km north west of Las Vegas, between 1951 and 1992. Over 900 tests were conducted underground, some of them directly in aquifers. An estimated 3.7 trillion litres of water were contaminated and are still unsafe to use, denying the people of Nevada access to a key natural resource. Lack of water has thwarted economic development in the area, including plans for a solar electric generation plant.136

Millions of Americans were exposed to radioactive iodine as a result of fallout from the tests. A Congressionally mandated study by the US National Cancer Institute that focused on doses of radiation resulting from the consumption of milk produced by cows grazing on contaminated pasture found that the fallout may cause between 7,500 and 75,000 cases of thyroid cancer in the country.137 Other serious illnesses associated with the testing, such as leukaemia, have affected Shoshone, Navajo and other Indigenous and non-Indigenous people living downwind of the test site.138

**Marshall Islands**

The most devasting incident of radioactive contamination took place 8,000 km from the US mainland during the Castle Bravo test in 1954. The US detonated the largest nuclear weapon in its history at Bikini Atoll in the Marshall Islands, causing fallout to spread over an area of more than 11,000km. Residents of nearby atolls, Rongelap and Utirik, were exposed to high levels of radiation, suffering burns, radiation sickness, skin lesions and hair loss as a result.139

Castle Bravo was just one of 67 nuclear weapons tests conducted by the US in the Marshall Islands between 1946 and 1958. Forty years after the tests, the cervical cancer mortality rate for women of the Marshall Islands was found to be 60 times greater than the rate for women in the US mainland, while breast and lung cancer rates were five and three times greater respectively.140 High rates of infant mortality have also been found in the Marshall Islands and a legacy of birth defects and infertility has been documented.141 Many Marshallese were relocated by the US to make way for the testing.

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141 H Barker, Bravo for the Marshallese: Regaining Control in a Post-Nuclear, Post-Colonial World (Cengage Learning, 2 edn, March 2012).
Some were moved to Rongelap Atoll and relocated yet again after the fallout from Castle Bravo left the area uninhabitable.

Rongelap Atoll was resettled in 1957 after the US government declared that the area was safe. However, many of those who returned developed serious health conditions and the entire population was evacuated by Greenpeace in 1984. An attempt to resettle Bikini Atoll was similarly abandoned in 1978 after it became clear that the area was still unsafe for human habitation.

A 2019 peer-reviewed study found levels of the radioactive isotope caesium-137 in fruits taken from some parts of Bikini and Rongelap to be significantly higher than levels recorded at the sites of the world’s worst nuclear accidents, Chernobyl and Fukushima.

**Climate emergency and nuclear waste in the Marshall Islands**

Compounding the injustice of nuclear weapons testing, the Republic of the Marshall Islands is now on the frontline of the climate emergency. The government declared a national climate crisis in 2019, citing the nation’s extreme vulnerability to rising sea levels and the “implications for the security, human rights and wellbeing of the Marshallese people”.

At Runit Island, one of 40 islands in the Enewetak Atoll, rising sea levels are threatening to release radioactive materials into an already contaminated lagoon. In the late 1970s, the US army dumped 90,000 cubic metres of radioactive waste, including plutonium, into a nuclear blast crater and covered it with a concrete cap. Radioactive materials are leaking out of the crater and cracks have appeared on the concrete cap. Encroaching salt water caused by rising sea levels could collapse the structure altogether. The Marshallese government has asked the US for help to prevent an environmental catastrophe but the US maintains that the dome is the Marshall Islands’ responsibility. Hilda Heine, then President of the Republic of the Marshall Islands, said of the dome in 2019:

> “We don’t want it. We didn’t build it. The garbage inside is not ours. It’s theirs.”

The Runit Island dome offers a stark illustration of the ways in which the injustices of nuclear weapons testing and climate change overlap. Marshall Islanders were left with the toxic legacy of nuclear weapons testing conducted on their territory by another state. The country is now being forced to deal with the effects of a climate crisis that they did not create, including the erosion of the Runit dome.

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143 CEW Topping et al, “In situ measurement of cesium-137 contamination in fruits from the northern Marshall Islands” PNAS 30 July 2019 116 (31) 15414-15419; first published July 15, 2019: [https://doi.org/10.1073/pnas.1903481116](https://doi.org/10.1073/pnas.1903481116).
148 Ibid.
The nations that contributed most to the crisis are failing to cut their emissions quickly enough to limit further global heating, leaving the Marshallese at the mercy of droughts, cyclones and rising seas. A recent study found that if current rates of greenhouse gas emissions are maintained, the Marshall Islands will be flooded with sea water annually from 2050. The resulting damage to infrastructure and contamination of freshwater supplies will render the islands uninhabitable.

If the US scrapped its nuclear weapons programme, it could give a portion of the billions of dollars that would be saved to the Republic of the Marshall Islands to help the country mitigate and adapt to climate disruption (see section 1.2.1 on international climate finance). The US could also use the freed-up funds to invest in its own Just Transition away from a fossil-fuel powered economy.

### 3.2.2. UK nuclear weapons testing

**Australia**

Between 1952 and 1957, the UK conducted a total of 12 major atomic weapons tests in Australia, at the Montebello Islands, Emu Field and Maralinga. A further 600 “minor” tests were carried out at Maralinga – part of the Woomera Prohibited Area in South Australia – leaving the area contaminated with 8,000 kg of uranium and 24 kg of plutonium. The choice of these locations by the UK government was rooted in the racist myth of *terra nullius* – the idea that Australia was empty land until Europeans colonisers arrived. Emu Field and Maralinga are situated far from Australia’s (mainly white) populations centres, but the land had been occupied by Maralinga Tjarutja people for thousands of years.

Neither British nor Australian authorities sought the permission of the Maralinga Tjarutja, whose land, culture and wellbeing were to be subordinated to the interests of British imperialists. When an Australian scientist asked British authorities about the potential danger to local Aboriginal people, the response was that “a dying race couldn’t influence the defence of Western civilisation”.

> “Our land is the basis of our culture – it is our church, our grocery shop, our schools, our chemist. But living a life and practising culture out in the desert wasn’t recognised as worthy by governments back then or still today ... This is one reason why Emu Fields and Maralinga were picked for testing. The English and Australian governments didn’t think that land was valuable – they called it a wasteland.”

Kokatha-Mula woman, Sue Coleman-Haseldine

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151 CD Storlazzi, “Most atolls will be uninhabitable by the mid-21st century because of sea-level rise exacerbating wave-driven flooding”, *Science Advance* 25 Apr 2018: Vol. 4, no. 4, eaap9741: https://doi.org/10.1126/sciadv.aap9741.  
Many Aboriginal people were displaced prior to the testing but others remained in the area. They were not adequately warned of the dangers and suffered blindness, radiation sickness and other health effects as a result.\textsuperscript{154}

After several botched clean-up operations by UK and Australian authorities, a AU$100 million rehabilitation programme was undertaken in the 1990s, largely as a result of campaigning by local Aboriginal people.\textsuperscript{155} However, radioactive contamination remains an area of 200 square kilometres is still unfit for human habitation.

Despite suffering displacement and severe health effects as a result of the testing, the Maralinga Tjarutja people have maintained their culture and rebuilt vibrant communities since the land was returned to them in 2009.\textsuperscript{156}

\textit{Kirimitati Island and Malden Island}

In 1954, the government of Winston Churchill decided that the UK needed to develop a hydrogen bomb (a more sophisticated and destructive type of nuclear weapon). The US and Russia had already developed an H-bomb and Churchill argued that the UK “could not expect to maintain our influence as a world power unless we possessed the most up-to-date nuclear weapons”.\textsuperscript{157}

The governments of Australia and New Zealand refused to allow a hydrogen bomb test to be conducted on their territories so the British government searched for an alternative site.\textsuperscript{158} Kirimitati Island and Malden Island in the British Gilbert and Ellice Islands Colony in the central Pacific Ocean (now the Republic of Kiribati) were chosen. Nine nuclear weapons tests – including the first hydrogen bomb tests – were carried out there as part of “Operation Grapple” between 1957 and 1958.

\begin{quote}
Launch of Yami Lester mural at Darebin, Melbourne, in 2019. Yami was blinded by the nuclear tests at Maralinga and subsequently played a key role in efforts to achieve recognition and justice for Aboriginal people affected by the tests.

\textit{Photo by Jeanette Pope}
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\textsuperscript{156} See the 2020 Australian Broadcasting Corporation documentary \textit{Maralinga Tjarutja} directed by Larissa Behrendt: \url{https://iview.abc.net.au/show/maralinga-tjarutja}.
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\textsuperscript{157} N Maclellan, \textit{Grappling with the Bomb: Britain’s Pacific H-Bomb Tests} (ANU Press, 2017), p 33.
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\textsuperscript{158} Ibid, p 35.
\end{flushleft}
Military personnel from the UK, New Zealand and Fiji (then a British colony) and Gilbertese labourers were brought in to work on the operation. Many of the service personnel were ordered to witness the tests in the open, on beaches or on the decks of ships, and were simply told to turn their backs and shut their eyes when the bombs were detonated. There is evidence that Fijian forces were given more dangerous tasks than their British counterparts, putting them at greater risk from radiation exposure. The local Gilbertese were relocated and evacuated to British naval vessels during some of the tests but many were exposed to fallout, along with naval personnel and soldiers.

After Grapple X, the UK’s first megaton hydrogen bomb test in November 1957, dead fish washed ashore and “birds were observed to have their feathers burnt off, to the extent that they could not fly”. The larger Grapple Y test in 1958 spread fallout over Kiritimati Island and destroyed large areas of vegetation.

Despite evidence that military personnel and local people suffered serious health problems as a result of the tests, including blindness, cancers, leukaemia and reproductive difficulties, the British government has consistently denied that they were exposed to dangerous levels of radiation and has resisted claims for compensation.

On the climate frontline
Like the Marshall Islands, the low-lying Republic of Kiribati is now bearing the brunt of the effects of climate change. Salt water washed in on king tides has contaminated the islands’ scarce freshwater resources. Pits that are used to grow taro plants have been ruined and the healthy subsistence lifestyle of local people is under threat.

It is predicted that rising sea levels will further impact freshwater resources and reduce the amount of agricultural land, while storm damage and erosion will increase. Much of the land will ultimately be submerged.

In anticipation of the need to relocate its entire population, the government of Kiribati bought 20km² of land on Fiji in 2014.

The UK is set to spend £3.4 billion a year on Trident nuclear weapons system between 2019 and 2070. If Trident were scrapped, a portion of the savings could be provide to the Republic of Kiribati in the form of climate finance (see section 1.2.1). Scrapping Trident would also allow money and

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160 N Maclellan op cit (see note 157), p 214.


skills to be redirected towards measures aimed at drastically cutting the UK’s carbon emissions (see section 1.2.2) – action that Pacific island nations are urgently demanding.164

3.2.3 Soviet nuclear weapons testing

The Soviet Union conducted most of its nuclear weapons testing in the Semipalatinsk region of Kazakhstan, contaminating water resources and large areas of agricultural land. When the Soviets decided that they needed to test larger nuclear bombs, they sought a more remote location.165

**Novaya Zemlya**

An archipelago in the Arctic Ocean in Northern Russia, Novaya Zemlya, was selected and construction of a test site began there in 1954. In the period up to 1990, 130 nuclear tests were carried out underground, in the ocean and atmospherically, including the most powerful nuclear weapon detonation in history (the Tsar Bomba, 1961).166

Prior to the testing, Soviet authorities forcibly relocated the islands’ Indigenous Nenets population to the mainland. The semi-Nomadic Nenets have been herding reindeer in the region for centuries and traditionally undertake an annual 1,000km migration between summer and winter pastures.

Fallout from the Soviet tests elevated radiation levels across Europe, but Indigenous peoples living in Northern Russia received the highest doses. Radioactivity also entered the food chain after reindeer fed on contaminated lichen.

The testing programme generated large quantities of radioactive waste, such as spent fuel rods, reactors and decommissioned nuclear weapons. Many of these items were simply dumped in the Barents and Kara seas, polluting the marine ecosystem and threatening the Russian and Norwegian fishing industries. Other radioactive waste was left in containers around the site.167

The expansion of extractive industries in the region and the effects of global heating now threaten the Nenets’ way of life. Russian oil and gas developments in the region (discussed in section 2.2.2) are encroaching on the pastureland that the Nenets use to graze their reindeer herds. Changing weather patterns have impacted the reindeers’ food supply and the annual migration has been disrupted.168

Global heating could have a disastrous effect on the nuclear waste left around Novaya Zemlya. A 2015 report by Russian scientists and doctors warned that if the snow and ice around nuclear waste storage sites melts, more radioactive contamination could be released into the environment.169

Thawing permafrost has already released anthrax spores from animal carcasses that were buried over 70 years ago, causing a deadly anthrax outbreak in 2016.

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166 The Tsar Bomba had a yield of 58 megatons (around 4,000 times more powerful than the Hiroshima bomb).

167 CTBTO op cit (see note 165).


3.3 NUCLEAR WEAPONS USE

In 1968, the US, UK, Russia, France and China, agreed under the Nuclear Non-Proliferation Treaty (NPT) to “pursue negotiations in good faith” on nuclear disarmament.\textsuperscript{170} Half a century later, this commitment remains unfulfilled and other states have developed nuclear weapons outside the NPT. The threat of nuclear weapons use and nuclear war has increased, and with this the risk of environmental catastrophe.

3.3.1 Environmental effects of one nuclear weapon detonation

The fireball, thermal pulse and shockwave generated by the detonation of just one nuclear bomb can destroy a whole city.\textsuperscript{171} Radioactive fallout would cause environmental and humanitarian harm far beyond the blast zone.

\textit{Hiroshima}

US detonation of a 15-kiloton atomic bomb over the Japanese city of Hiroshima in August 1945, generated a fireball 370 metres wide. Temperatures on the ground reached 4,000 °C and the shockwave brought winds speeds of up to 440 metres per second.

Much of the city was reduced to tiny granules that were sucked up into an immense mushroom cloud and later deposited over a wide area.\textsuperscript{172} Radioactive “black rain” began to fall on the city within half an hour of the explosion.

“It's estimated that up to 80,000 people were killed instantly in Hiroshima and another 60,000 perished in the following months from burns, radiation sickness, and other injuries.” \textsuperscript{173} Others

\textsuperscript{170} It should be noted that the treaty also commits state parties to pursuing good-faith negotiations “on general and complete disarmament” (GCD) but this obligation has, likewise, been unfulfilled. For more on the history of efforts to achieve GCD see: “Rethinking general and complete disarmament in the twenty-first century” (UNODA Occasional Paper No 28, October 2016): \url{https://www.un.org/disarmament/publications/occasionalpapers/no-28/}.

\textsuperscript{171} In a Nutshell: “What if We Nuke a City?” (Kurzgesagt-ICRC, October 2019): \url{https://www.youtube.com/watch?v=5iPHbr_eilQ}.


developed serious illnesses, such as cancer and leukaemia, in the years that followed. Women who were exposed to ionising radiation were nearly twice as likely as men to develop solid cancers.\textsuperscript{174}

Most of the weapons in today’s nuclear arsenals are many times more powerful than the bomb used on Hiroshima and therefore capable of much greater levels of destruction.

\textbf{Glasgow}

What would happen if a nuclear bomb was detonated in Scotland’s most populous city, Glasgow? Modelling by NUKEMAP shows that detonation of a 100 kiloton\textsuperscript{175} nuclear bomb in the city centre would generate a fireball 500 metres wide. The blast would damage structures up to 5.5 km from the detonation site.\textsuperscript{176} Thermal radiation would extend over an area of nearly 50 square kilometres, from Govan Hill in the South to Maryhill in the North, bringing potentially fatal doses of radiation and third degree burns to anyone in the vicinity. Over 73,000 people would be killed and over twice that number injured.

\begin{figure}[h]
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\includegraphics[width=\textwidth]{NUKEMAP_modelling_Glasgow.png}
\caption{NUKEMAP Modelling of a nuclear detonation over Glasgow city centre}
\end{figure}

If the wind was blowing from South West to North East (the dominant wind direction in Glasgow), nuclear fallout would be carried towards Stirling, Perth and Dundee, covering a total area of over 4,000 square kilometres. Depending on their levels of exposure, many more people could die of radiation sickness and cancer. Radioactive particles would contaminate soil and water, making animal products, such as milk and meat, and crops grown the area unsafe to consume.

\begin{itemize}
\item \textsuperscript{175} The W76 warheads carried on British and American submarines have a yield of 100 kilotons.
\item \textsuperscript{176} NUKEMAP is a resource created by nuclear historian, Alex Wellerstein: \url{https://nuclearsecrecy.com/nuke}. Modelling used for this example is available at: \url{https://nuclearsecrecy.com/nuke/?&kt=100&lat=55.87&lng=-4.27&airburst=0&hob_ft=0&casualties=1&fallout=1&ff=50&fallout_angle=231&psi=20,5,1&cloud=1&zm=9}.
\end{itemize}
3.3.2 Environmental and climate effects of nuclear war

The effects of a nuclear war would be far more devastating. Several studies have shown that a nuclear exchange using less than 1% of the world’s 13,400 nuclear weapons would alter the Earth’s climate and precipitate widespread famine.\(^{177}\)

If 100 Hiroshima-sized nuclear bombs were targeted on cities in a regional nuclear conflict, such as a war between India and Pakistan, firestorms would send millions of tonnes of smoke and dust into the atmosphere. Some of this smoke would be lofted into the stratosphere where it would remain for years, preventing sunlight from reaching the Earth’s surface.

Global average temperatures would drop by several degrees and rainfall would be reduced, impacting food production in many regions for at least a decade. Food scarcity and the resulting increase in food prices would leave two billion people at risk of starvation. Many more would be threatened by epidemics of infectious disease.

This so-called “limited” nuclear war would also damage the Earth’s ozone layer, increasing levels of UV radiation that would harm plants, animals and aquatic ecosystems and pose grave health risks to people, such as vision impairment and skin cancers.\(^{178}\)

According to Scientists for Global Responsibility, detonation of the 40 nuclear warheads carried on a British nuclear-armed submarine could have similar climactic consequences.\(^{179}\)

A larger nuclear conflict, such as a war using Russian and US strategic nuclear weapons, would cause a full-blown nuclear winter. The amount of smoke in the stratosphere would block 90% of sunlight across most of the world and global average temperatures would plummet to levels last experienced during the Ice Age, 18,000 years ago.\(^{180}\)

These climactic changes would “basically kill all of our crops and most of us would be sentenced to death by famine”, according to distinguished climatologist, Professor Alan Robock.\(^{181}\)

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179 SGR op cit (see note 34), pp 26 ff.


4. CONCLUSION: ADDRESSING THE INJUSTICES OF NUCLEAR WEAPONS AND CLIMATE CHANGE

Nuclear-armed nations have resisted calls for disarmament on the grounds that nuclear weapons provide “deterrence” and keep us safe. But nuclear weapons cannot deter the most serious threats to our security, including the climate disruption described in section 1.1.

The continuing existence of nuclear weapons, in fact, puts the whole world danger. Only luck has prevented nuclear weapons being used since the bombings of Hiroshima and Nagasaki in 1945; there have been numerous incidents of near use in the intervening years.\(^{182}\)

The “modernisation” of nuclear arsenals and interstate competition described in section 2.1 are heightening the risk that nuclear weapons will be used again in the near future, either intentionally or inadvertently. These developments also detract from international efforts to address the climate emergency.

Furthermore, the narrative of “deterrence” and “security” obscures the environmental damage and health impacts that nuclear weapons production and testing has inflicted, on predominately Indigenous communities, as well as the gendered impacts of nuclear weapons. This is “security” for some, built on harm to others.

Most other nations agree that the only safe way to deal with nuclear weapons is to eliminate them completely. In 2017, 122 countries adopted the United Nations Treaty on the Prohibition of Nuclear Weapons, which bans all nuclear weapons activities.\(^{183}\) The treaty recognises that the consequences of nuclear weapons transcend national borders and pose grave implications for human survival and the environment.

The treaty also recognises that Indigenous people have been disproportionately affected by nuclear weapons activities and recognises the disproportionate impact of ionising radiation on women and girls. Article VI seeks to redress nuclear injustices by compelling states that have tested and used nuclear weapons to “provide adequate assistance to affected States Parties, for the purpose of victim assistance and environmental remediation”.

The treaty has already upset the international order. Powerful nuclear-armed nations opposed the treaty and boycotted the negotiations but the rest of the world went ahead and banned nuclear weapons without them. Now social pressure is required to ensure that the elimination of nuclear weapons follows from the treaty’s entry into force.\(^{184}\) Likewise, only mass action will compel governments to take the drastic action that is needed to limit global heating.

There is clearly a need to build on existing efforts and grow an international movement that addresses the climate and ecological emergency and seeks to achieve nuclear disarmament and end militarism. This movement must also commit to ending longstanding structural inequalities and injustices within and between nations.

The climate justice movement has already mobilised millions to demand an urgent response to the climate emergency that is centred on human rights, equity, and justice. Groups like Extinction Rebellion Peace are organising around the nexus between militarism and climate change, while CND

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\(^{184}\) At the time of publication, 40 states have ratified the treaty meaning that only 10 more ratifications are required for entry into force: https://www.icanw.org/signature_and_ratification_status.
is campaigning for the money spent on Trident to be invested in dealing with the threat of climate change. The COVID-19 crisis has given added urgency to these efforts and a growing number of organisations are taking an intersectional approach.

**Intersectional collaboration demands a Just and Green Recovery**

In May 2020, Don’t Bank on the Bomb Scotland and the Scottish Campaign for Nuclear Disarmament, along with 80 other environmental groups, charities, trades unions, churches and other organisations wrote an open letter to Scotland’s First Minister that calls on Scotland to lead a radical response to the climate and COVID-19 crises.186

The letter outlines five steps that the Scottish government should take to deliver a just and green recovery from these crises, including providing public services for people, not profit; redistributing wealth; providing new funds to transform our society and economy to meet Scotland’s fair share of climate emissions cuts; strengthening democracy and human rights; and supporting an international coronavirus and climate emergency response.187

To this, we would add:

1. **The Scottish government should endorse a concept of security that is based on human rights, social justice and the protection of our environment, not the defence of “national interests” and the domination of other nations.**
2. **The transformation of our economy must include a transition away from military production as well as a transition away from the production and use of fossil fuels. To this end, the Scottish government should establish a Scottish Defence Diversification Agency.**
3. **The Scottish government is firmly opposed to nuclear weapons and has called on the UK government to sign the Treaty on the Prohibition of Nuclear Weapons. The Scottish government should commit to signing the treaty and removing Trident from Scotland within three years of a referendum that results in a vote for independence.**188

As the letter to First Minister Sturgeon states, “the recovery from coronavirus is a rare chance to markedly accelerate the repurposing of government away from the prioritisation of economic growth and towards goals of wellbeing and sustainability, ending inequality and environmental destruction.”

The nuclear disarmament movement will work towards this goal with environmental organisations, social justice and anti-racism campaigners to ensure that the opportunity does not pass.

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185 Climate Not Trident: [https://cnduk.org/campaigns/climate-not-trident/](https://cnduk.org/campaigns/climate-not-trident/).
186 “The recovery from the coronavirus crisis must be a green and just one” (*The National*, 31 May 2020): [https://t.co/LdqaITnaX?amp=1](https://t.co/LdqaITnaX?amp=1).