



BANGLADESH ACADEMY OF SCIENCES (BAS) STATEMENT ON THE CATASTROPHIC EFFECTS OF NUCLEAR WAR

Nuclear weapons remain one of the greatest threats to humanity because of their unprecedented destructive power and catastrophic humanitarian, environmental, and socioeconomic consequences. Since the first nuclear weapon test, the Trinity Test,ⁱ conducted by the United States in 1945, more than 2,000 nuclear tests have been carried out worldwide. The first and only wartime use of nuclear weapons occurred during the Second World War, when atomic bombs were dropped on Hiroshima on 6 August 1945 and Nagasaki on 9 August 1945,ⁱⁱ causing the deaths of nearly 200,000 people within a short period and leaving generations to suffer from long-term health and environmental consequences.

According to independent estimates, the world's nine nuclear-armed states—the United States, the Russian Federation, the United Kingdom, France, China, India, Pakistan, Israel, and the Democratic People's Republic of Korea (North Korea)—collectively possess more than 12,000 nuclear weapons. Many of these weapons are deployed and ready for immediate use, while others can be activated within a short period. Numerous modern nuclear warheads have explosive yields hundreds or even thousands of times greater than those of the bombs dropped on Hiroshima (16 kilotons) and Nagasaki (approximately 20 kilotons).

Historical evidence from Hiroshima and Nagasaki, combined with modern consequence-assessment research, indicates that the detonation of a modern-day thermonuclear weapon in a major urban area would cause catastrophic loss of life within minutes, hours, and days. Nonetheless, recent studies also show that a large nuclear explosion can generate a massive fireball, with extreme thermal radiation, powerful shockwave, and widespread ionizing radiation causing hundreds of thousands to millions of immediate fatalities. Recent climate-modeling studies demonstrate that a large-scale nuclear exchange between major nuclear powers—particularly the United States and Russia could trigger a nuclear winter, cause a collapse of global food production and ultimately put millions of people at risk of starvation worldwide.

Recognizing the grave dangers posed by nuclear weapons, the international community established the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) under the auspices of the United Nations, which entered into force in 1970.ⁱⁱⁱ The NPT has played a vital role in limiting the spread of nuclear weapons and facilitating arms control. Subsequent agreements, including the Strategic Arms Reduction Treaty (START) and the New START Treaty between the United States and the Russian Federation,^{iv} contributed significantly to reducing global nuclear arsenals. However, progress has slowed in recent years. The future of New START remains uncertain, while ongoing conflicts in Europe and the Middle East have renewed concerns over nuclear competition and accelerated the modernization of nuclear forces. Despite these developments, leaders of the major nuclear-weapon states have repeatedly affirmed the principle that "a nuclear war cannot be won and must never be fought."

The United Nations and its specialized agencies, the International Campaign to Abolish Nuclear Weapons (ICAN), the International Committee of the Red Cross (ICRC), numerous civil society organizations, the Scientific Advisory Group (SAG) of the Treaty on the Prohibition of Nuclear Weapons (TPNW),^v and independent scientists around the globe have been consistently advocating for the elimination of nuclear weapons because of their catastrophic humanitarian consequences, including their disproportionate impacts on women and children.



On the occasion of the 80th anniversary of the Trinity Test,^{vi} 129 Nobel Laureates issued a declaration stating:

"We call on all states to increase investments and cooperative research on the environmental, social, military, and economic impacts of nuclear conflict, including limited or regional scenarios, and to support the upcoming UN Independent Scientific Panel on Nuclear War Effects."

Recognizing the devastation caused by the atomic bombings of Hiroshima and Nagasaki, the Laureates further urged:

"We call on scientists, academics, civil society, and communities of faith to help create the necessary pressure on global leaders to implement nuclear risk reduction measures."

Similarly, the Academies of Science of the G7 countries have emphasized that a full-scale nuclear war between the United States and the Russian Federation, which possess the world's largest nuclear arsenals, would devastate both nations and have severe global consequences. Furthermore, several recent scientific studies have concluded that even a limited regional nuclear conflict, such as one between India and Pakistan, could cause catastrophic humanitarian and environmental consequences extending far beyond the directly affected region, potentially resulting in hundreds of millions of deaths through both immediate and indirect effects.

The National Academies of Sciences, Engineering, and Medicine of the United States have also recognized that the atomic bombings of Hiroshima and Nagasaki caused severe and long-lasting environmental damage, together with profound societal, economic, and public health consequences.^{vii,viii}

Recognizing the urgent need for evidence-based assessment, the United Nations General Assembly, through Resolution 79/238, established an Independent Scientific Panel on the Effects of Nuclear War.^{ix} The Panel has been mandated to examine the physical effects and societal consequences of nuclear war at the local, regional, and global levels, including climatic, environmental, radiological, public health, agricultural, ecological, and socioeconomic impacts in the days, weeks, and decades following a nuclear conflict. The Panel will review existing scientific evidence, commission additional studies where necessary, and publish a comprehensive report identifying key findings and future research priorities.

Since its independence, Bangladesh has consistently maintained a principled and unwavering position against nuclear weapons. Bangladesh is a State Party to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), the Treaty on the Prohibition of Nuclear Weapons (TPNW), and the Comprehensive Nuclear-Test-Ban Treaty (CTBT).^x Bangladesh has also concluded the IAEA Comprehensive Safeguards Agreement,^{xi} reaffirming its commitment to nuclear non-proliferation and the peaceful use of nuclear energy. Nevertheless, any regional or global nuclear conflict would have devastating consequences that would transcend national borders and jeopardize sustainable development, human security, and global civilization.

The Bangladesh Academy of Sciences (BAS) recognizes the catastrophic humanitarian, environmental, economic, and societal consequences of nuclear weapons and therefore calls for the following actions:

1. The immediate global prohibition and complete elimination of all nuclear weapons.



2. All nuclear weapons States must fulfill their obligations under Article VI by taking effective measures toward ending the nuclear arms race and achieving complete nuclear disarmament under strict and effective international control.
3. Bangladesh should continue to uphold its commitments under the NPT, TPNW, CTBT, and related international agreements, while actively encouraging all states to sign, ratify, and implement the Treaty on the Prohibition of Nuclear Weapons through regional and international forums.
4. Universities, scientific institutions, and research organizations should promote multidisciplinary research on the humanitarian, environmental, climatic, public health, economic, and societal impacts of nuclear war, thereby strengthening scientific understanding, capacity building and supporting evidence-based policy decisions aimed at preventing nuclear conflict.

The Bangladesh Academy of Sciences firmly believes that scientific knowledge, international cooperation, and sustained global commitment are indispensable for achieving a world free from nuclear weapons. BAS reaffirms its support for all national and international initiatives that advance nuclear disarmament, reduce nuclear risks, and promote lasting peace, security, and sustainable development for present and future generations.

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- ⁱ Trinity Site: The World's First Nuclear Explosion. U.S. Department of Energy, 2018 (<https://www.energy.gov/lm/trinity-site-worlds-first-nuclear-explosion>)
 - ⁱⁱ Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO). (n.d.). 6 and 9 August 1945 - Hiroshima and Nagasaki. (<https://www.ctbto.org/news-and-events/news/6-and-9-august-1945-hiroshima-and-nagasaki>)
 - ⁱⁱⁱ Treaty on the Non-Proliferation of Nuclear Weapons. 12 June 1968. United Nations Office for Disarmament Affairs, United Nations Office for Disarmament Affairs (<https://www.iaea.org/publications/documents/treaties/npt>)
 - ^{iv} Treaty on the Reduction and Limitation of Strategic Offensive Arms (with Memorandum of Understanding and Associated Documents). Signed at Moscow on 31 July 1991. United Nations Treaty Series, vol. 1881, I-32050 (<https://armscontrolcenter.org/strategic-arms-reduction-treaty-start-i/>)
 - ^v Treaty on the Prohibition of Nuclear Weapons, July 7, 2017, United Nations, Treaty Series, vol. 3192 (https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVI-9&chapter=26)
 - ^{vi} The Nobel Laureate Assembly Declaration for the Prevention of Nuclear War. By Nobel Laureate Assembly for the Prevention of Nuclear War | Article | July 16, 2025 (<https://thebulletin.org/2025/07/the-nobel-laureate-assembly-declaration-for-the-prevention-of-nuclear-war/>)
 - ^{vii} National Academies of Sciences, Engineering, and Medicine (2025): Details the direct urban devastation and environmental harm in Potential Environmental Effects of Nuclear War (<https://www.nationalacademies.org/read/27515/chapter/3>)
 - ^{viii} Radiation Effects Research Foundation (RERF): Provides ongoing comprehensive data on the long-term health consequences of radiation in Eight decades of research on the long-term health effects of the atomic bombings (<https://pmc.ncbi.nlm.nih.gov/articles/PMC12558143/>)
 - ^{ix} United Nations General Assembly, Nuclear war effects and scientific research: resolution / adopted by the General Assembly, A/RES/79/238 (24 December 2024) (<https://digitallibrary.un.org/record/4071347?v=pdf>)
 - ^x Comprehensive Nuclear-Test-Ban Treaty, opened for signature Sept. 24, 1996, S. Treaty Doc. No. 105-28 (1997), 35 I.L.M. 1439 (1996) (https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVI-4&chapter=26).
 - ^{xi} IAEA INFIRC/301 (<https://www.iaea.org/sites/default/files/infirc301.pdf>)