APLN
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FOR NUCLEAR NON-PROLIFERATION AND DISARMAMENT

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A WARMING WORLD AND GEOPOLITICAL THREATS: HEAT, HOSTILITY AND NUCLEAR SECURITY

Rubina Waseem, Head of research and assistant professor at the Centre for International Peace & Stability (CIPS), National University of Sciences & Technology (NUST), Pakistan
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Wildfires and floods across the world have reminded us that climate change cannot be treated as just an environmental issue. It is an evolving global security threat. Extreme weather is not a hypothetical concern for the safety of nuclear facilities especially in regions where geopolitical tensions are adding pressure to climate stress. These challenges are not separate but deeply connected, and we need to start treating them that way.

Natural disasters threaten infrastructure

In 2024 France's Golfech reactor on the Garonne River had to shut down because the river it uses for cooling topped the 28 degrees Celsius safety limit during a European heatwave that also forced Hungary's Paks and Switzerland's Beznau plants to reduce their output. A more volatile climate is pushing nuclear facilities and operations into emergency mode.

When Super Typhoon Yagi swept through the Philippines, Vietnam and Myanmar the same year, it damaged transmission lines, flooded substations and left entire regions without power. The damage showed just how quickly extreme weather can undermine critical infrastructure and complicate any nuclear emergency response.

Several governments in Southeast Asia are planning to build new nuclear reactors and small modular units. But policy and safety measures have not kept pace with the risks. Climate stress tests, reliable backup cooling systems and regional emergency drills are

urgently needed before the next typhoon or heatwave turns a power source into a potential threat. This increases grave apprehensions for regional nuclear safety and reminds us how closely climate challenges and energy security are linked.

The Fukushima disaster showed the world the vulnerabilities of nuclear facilities to natural disasters, but it should not be treated as an isolated event. As climate change intensifies and geopolitical tensions escalate, the risks stem not just from the environment. Russia's repeated shelling in March 2022 near Ukraine's Zaporizhzhia nuclear plant — the largest plant in Europe — shows how war zones can become potential nuclear hazards.

Likewise, the United States strikes on Iran's nuclear facilities raises concern about the fallout — political or literal — of attacking sensitive nuclear facilities. In today's volatile world, the combination of climate stress and fragile geopolitics makes the margin for error dangerously thin.

Beyond physical threats, climate change disrupts nuclear supply chains through extreme weather events, potentially delaying maintenance and emergency repairs. On the Korean Peninsula, the opacity surrounding North Korea's nuclear program, coupled with frequent typhoons and heavy rains, elevates accident risks. Additionally, the increasing complexity of digital infrastructure raises cybersecurity risks, particularly during or after climate-induced disasters when systems are vulnerable due to loss of power. Financially, rising climate risks may prompt insurers to increase premiums or limit coverage for nuclear facilities, influencing investment and the future viability of nuclear power in some regions.

Preventing disaster

International cooperation remains crucial. Southeast Asia's experience with Typhoon Yagi underscores the value of regional collaboration. Researchers at the Resilience Development Initiative have pushed Southeast Asian governments to strengthen transboundary cooperation and enhance regional resilience. There is fortunately a growing awareness in some of the most vulnerable areas that climate-change induced nuclear incidents in one country could have further environmental and security consequences in another.

Establishing regional early-warning systems, sharing best practices and developing joint crisis response mechanisms are practical steps to enhance resilience. Shared safety standards are another important factor for learning and coordination between different states. Organizations such as the International Atomic Energy Agency play a pivotal role in facilitating research, funding and harmonizing safety protocols.

Confidence-building measures, including non-attack agreements like the one between Pakistan and India could reduce the dangers of conflict-induced environmental

disasters, and should be considered in other parts of the Asia-Pacific, including the Korean Peninsula.

The intersection of climate change, nuclear risks and unresolved conflicts presents an urgent challenge for policymakers. Addressing these threats requires inclusive, coordinated action at local, regional and global levels. By embedding climate risk assessments into nuclear safety planning to reinforce international legal frameworks and fostering transparent public engagement, states can reduce the likelihood of cascading crises and promote a safer future.

The opinions articulated above represent the views of the author(s) and do not necessarily reflect the position of the Asia-Pacific Leadership Network or any of its members.

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The **Asia-Pacific Leadership Network for Nuclear Non-proliferation and Disarmament (APLN)** is a Seoul-based organisation and network of political, military, diplomatic leaders, and experts from across the Asia-Pacific region, working to address global security challenges, with a particular focus on reducing and eliminating nuclear weapons risks. The mission of APLN is to inform and stimulate debate, influence action, and propose policy recommendations designed to address regional security threats, with an emphasis on nuclear and other WMD (weapon of mass destruction) threats, and to do everything possible to achieve a world in which nuclear weapons and other WMDs are contained, diminished, and eventually eliminated.


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