



GLOBAL UNIVERSITY FOR
SUSTAINABILITY BOOK SERIES

Fukushima: A Monument to the Future of Nuclear Power

Edited by
Sit Tsui · Lau Kin Chi

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Global University for Sustainability Book Series

Series Editors

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The book series aims to publish books and monographs drawing on the expertise of the Global U Founding Members by offering a succinct analysis of global crises affecting the ecological, social, political, and economic aspects, as well as to explore transformative visions and praxis for sustainability. Some books may be translated from their original language into English.

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About the Global U Book Series

Global University for Sustainability (Global U) is an international network of around 200 renowned scholars/activists, with a substantial number from Asia, Africa, and Latin America, apart from those from Europe and North America. They are academic scholars, peace activists, community workers, food producers, and rural reconstruction promoters, among others (please see <https://our-global-u.org/ogu.org/en/>).

Since 2011, Global U has organized the South South Forum on Sustainability, with over 10 co-organizing universities and institutions from China and overseas. The Forum is a platform for dialogues and exchanges among grassroots and resistance practices in the production, dissemination, and use of knowledge as instruments of problematization and self-organization, as well as interactions among thinkers in search of paradigms for peace and justice. Since 2020, Global U has organized South South Dialogue on Sustainability Series, such as Venezuela in Struggles, Experiences with Indigenous

Communities in Chiapas, and African People's Struggles for Liberation, Constructing Alternative Paradigms in Brazil, and Rojava—Resistance, Resilience, and Renewal Democratic Confederalism and the Changing Face of Revolution. All proceedings of the Forums and Dialogues were video-recorded and uploaded to the Global U websites.

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The three main categories falling under this series are:

- General analysis (e.g., history of political economy of a country; issue of sustainability; nuclear disasters, energy crisis, pandemic, climate change); with a focus on China and the Global South.
- Biographies, autobiographies, or anthologies of eminent thinkers from around the world, especially from Asia, Africa, and Latin America, connecting their personal trajectory to their thought and the larger context.
- Analysis and interpretation of on-the-ground experiences highlighting how local communities negotiate with economic and other forces impacting on them and organize in alternative ways.

Lau Kin Chi
Sit Tsui

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Foreword: Continuing Conversations: The Monumental Symbolism of Fukushima

Anita Rampal

On March 11, 2024 Japan observed the 13th anniversary of the Fukushima disaster, that had seen over 20,000 people dying and towns being wiped out after a massive earthquake (9.0 on the magnitude scale) and a tsunami had hit the northern coasts. The tsunami which at some places rose up to 15 meters (50 feet) had battered the Fukushima Daiichi nuclear plant and destroyed its power supply and fuel cooling systems, causing meltdowns at three of its reactors. The exploding hydrogen had caused massive radiation leaks with contamination in the neighboring areas. Investigations and court decisions had attributed the accident to human error, safety negligence, lax oversight by regulators and collusion. All the nuclear power plants in Japan had been shut down after the 2011 Fukushima nuclear disaster for safety checks under stricter standards. However, the government has been pushing for increased use of nuclear energy and has been working on getting the reactors restarted,

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though apprehensions, fear and anti-nuclear sentiments have prevailed among the public. Of the 33 workable reactors 12 have since restarted.

Worryingly, two months earlier, on New Year's Day in 2024, a major earthquake (7.6 on the magnitude scale) with several strong aftershocks had triggered a tsunami and left about 250 people dead in the north central Ishikawa prefecture. At the Shika nuclear power plant in Ishikawa, two idled reactors had suffered damage to transformers causing power outages, spilling of radioactive water from spent fuel cooling pools, and cracks on the ground. The Hokuriku Electric Power Company claimed that no radiation had leaked outside. However, since the earthquake had severely damaged the roads and houses in the region, the residents had serious safety concerns about the possibilities of evacuation in a worse situation. A petition was submitted by residents of towns near Japanese nuclear plants asking regulators to halt safety screening for the restart of idled reactors, until a rigorous examination was done of the damage to this plant and the spilling of radioactive water during this powerful earthquake.

Importantly, Fukushima continues to pose major concerns about the 880 tons of nuclear fuel that melted and remained inside the three damaged reactors, which the officials say can take another 30–40 years to remove. There is yet no clear understanding of the state of the molten debris; robotic probes were used to check inside the reactors, but technical and other complications and high levels of radiation have delayed the process. The fuel in the worst-damaged No. 1 reactor had fallen from the core to the bottom of its containment vessel, some of it had penetrated into the concrete foundation, making it more difficult to remove. Clearly 'removal' of radioactive substances is not a simple process of cleaning up. Meanwhile since August 2023, Tokyo Electric Power Company Holdings (TEPCO) has begun treating, diluting with sea water, and then releasing, the immense volume of cooling water which had got contaminated with radiation during the 2011 meltdown of the reactors. It is going to be a slow monitored process; after keeping it stored for 12 years the contaminated cooling water is being pumped up, treated and stored in almost 1,000 tanks, before being intermittently discharged into the sea. The plan to release 31,200 tons of the treated water by the end of March 2024 is expected to empty only 40 tanks.

However, in February 2024 an estimated 6 tons of radioactive water leaked out through an air vent of a filtering treatment machine and seeped into the soil around it, but TEPCO said no one was injured. Though the leaked water was 10 times more radioactive than the legally releasable limit, it had not escaped the compound and did not impact the environment outside. The project to discharge treated contaminated water into the sea, expected to continue for some decades, has raised safety and environmental concerns, with opposition from fishworkers and also some neighboring countries, including China, which had banned imports of all Japanese seafood.

Indeed, serious concerns and uncertainties prevail regarding this long drawn out decommissioning process; understandably most evacuees are reluctant to return home, on account of lack of jobs, schools, continuing fears of the radiation, and importantly, lost communities. How do public discourses, popular culture, scientific debate, and people's beliefs continue to engage with such an enormous issue—entangled in unthinkable devastation, displacement, loss, survival, memories, anxieties, uncertainties and reassurances?

This book is a monument—to the monumental symbolism of Fukushima—beyond molten reactors, destroyed land, the pain of lost communities, memories or futures, or the energy need of all times. *Fukushima—A Monument to the Future of Nuclear Power* attempts to offer a nuanced way of acknowledging, grieving and also redeeming strength to look ahead, with caring concern for the planet and all its human and non-human inhabitants.

The book vicariously locates us with the people of Fukushima, and the enduring memories and voices of people's resistance and solidarity. We bear witness to a special monument created on March 11, 2021, the 10th anniversary of the nuclear disaster with the message:

Monument of Regrets and Messages to the Future about Nuclear Power

Resisting the tyranny of the nuclear industry and government for 40 years, we failed to prevent a nuclear disaster from happening. Nuclear power has revealed its extremely dangerous nature, robbing our homeland of its past, present, and future. We aim to convey the importance of

sharpening our senses, applying wisdom, and uniting to face irrational schemes with scientific power and boundless love for life.

Continuing Critical Conversations

When the highly acclaimed film *Oppenheimer*, with a viewership of well over a hundred million was finally released in Japan in March 2024, eight months after its global opening and weeks after its Academy Awards sweep, there was initial criticism for its muted representation of the atom bombs dropped on Hiroshima and Nagasaki. There were also hopeful commentaries which invoked the critical space for introspection, especially in the present superpower conflagrations on war. A statement by lawyer Hiroyuki Shinju, as published by the Tokyo Bar Association, expressed the hope that it would ‘serve as the starting point for addressing the legitimacy of the use of nuclear weapons on Hiroshima and Nagasaki, as well as humanity’s, and Japan’s, reflections on nuclear weapons and war.’ There were reasons to consolidate people’s movements that had been vigorous since the dropping of the atom bombs, which gained energy after the Fukushima accident in 2011, but were seen to be losing momentum since then.

There have indeed been many conversations around the film *Oppenheimer*, the Pulitzer prize-winning biography *American Prometheus* on which it was based, the script by its director Christopher Nolan, and several perceptive interviews with him across the media. There have been numerous analyses of why such a serious theme (with no ‘superhero’) with difficult debates on quantum physics has captured the minds of millions, including young audiences, across the world.

My own doctoral research in quantum theoretical physics, familiarity with the work of most physicists shown in the film, and my teaching of Science and Technology Studies from a socio-cultural and political perspective has deeply engaged me in some of these conversations. I was however amazed to find full houses running with young audiences attentively watching the abstract discussions, even paying for an expensive ticket, when *Oppenheimer* was first released in India. Again on my

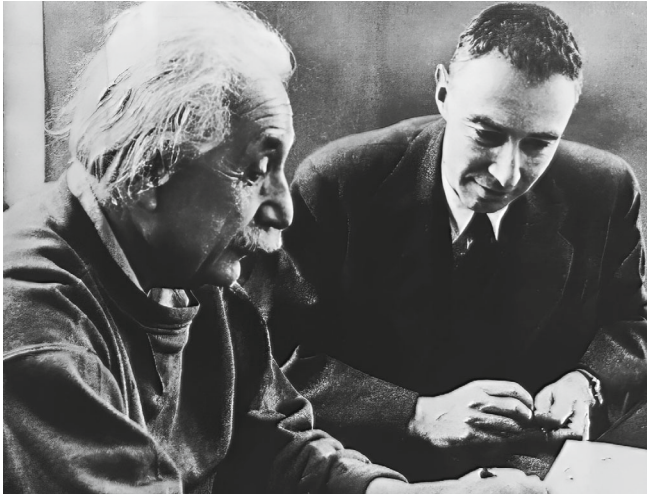
next viewing, this time in the striking high resolution IMAX format (less expensive on the film's second release after the Academy nominations) I was indeed happy to meet some young people watching it even for the sixth time.

Much has been written about the soul-shattering responses to the last scenes of the film, which show the critical conversation in 1947, two years after the Japan bombings, where Oppenheimer reminds Einstein of a conversation they had had before the physicists had tested the first atom bomb.

Oppenheimer says to Einstein, "When I came to you with those calculations, we thought we might start a chain reaction that might destroy the entire world."

"What of it?" Einstein asks.

"I believe we did," says Oppenheimer.



(Albert Einstein and Robert Oppenheimer. Institute for Advanced Study)

For director Christopher Nolan, this was the 'biggest fear' that had propelled him to pursue the idea since he had first heard of Oppenheimer

in the 1980s, as a teenager. When later he came to know that scientists at Los Alamos had found an infinitesimal probability, which mathematically could not be eliminated to zero, of the Trinity test destroying all life on earth, and *yet* had gone ahead, it struck him as the most dramatic turn in world history. It had driven him to pursue the dilemmas in his film, of a responsibility that no one in the world had ever faced. These scientists feared that political leaders did not fully understand the dangers of the bomb, and after the war had strongly advocated for nuclear technology to be under international control, to avert a global nuclear arms race. A group of them started the *Bulletin of the Atomic Scientists* for wider public education on nuclear weapons and energy, and Oppenheimer was the first chair of the magazine's Board of Sponsors.

Interestingly, before the film's release in 2023, John Mecklin editor-in-chief of the *Bulletin of the Atomic Scientists*, conducted a perceptive interview with Christopher Nolan. Excerpts from Nolan's responses are given below, essential for us to appreciate the tangled troubling contours of the nuclear debates—from the bombs dropped on Japan, the Fukushima disaster, to the two ongoing wars, with renewed demand for nuclear power, and the need for greater critical public engagement.

Nolan:

I remember clearly a conversation I had with one of my teenage sons where I told him what I was working on. And he literally said to me, "Well, nobody really worries about nuclear weapons anymore. Are people going to be interested in that?" ...But, of course, what then in awful, actual fact has happened, is the world has once again been reminded of the threat. ... part of the intention of the film is to reiterate the unique and extraordinary danger of nuclear weapons. ... You're normalizing killing tens of thousands of people. I hear that from both sides of the political spectrum, I feel we're in a world now where people are starting to once again talk about those things as some kind of acceptable possibility for our world.

Entertaining is a sort of reductive word, we tend to think of that as happy, funny things, whatever, but it's not. It's about engagement. It's about: Does the film resonate with people, do they think about it afterward, do they tell other people to go see it, and that kind of thing? And we're