

HPI Public Lecture Series Report 2022

# A Hiroshima Approach to Peace Studies

**Narayanan Ganesan**

The February 2021 Military Coup in Myanmar:  
Its Impact on Domestic Politics and Foreign Policy

**Robert Jacobs**

The History of the Global Hibakusha



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## Editorial Note

Hiroshima Peace Institute (HPI) of Hiroshima City University conducts a public lecture series for citizens both in English and Japanese every year. The English lecture series has been held since 2016 at the Satellite Campus of Hiroshima City University. In 2021, it was impossible to offer face-to-face events due to COVID-19, so that an online lecture series was held for the first time. The English and Japanese lecture series were amalgamated into one joint series in Japanese and English titled, “A Hiroshima Approach to Peace Studies.” Five lectures were delivered on YouTube, each for one week only, from January 7 to February 10, 2022. Two of the lectures that were held in English are the lectures discussed in this report.

In the first lecture, Prof. Narayanan Ganesan focused on the February 2021 Military Coup in Myanmar. He introduced the historical background of the democratization process followed by the military coup and analyzed the factors which led to the coup. The discussion also examined the impact of the coup on domestic and foreign politics and policy, providing the latest information about Myanmar.

Prof. Robert Jacobs analyzed the history of the global hibakusha which means not only the survivors of the nuclear attacks in Hiroshima and Nagasaki but also many other people who have suffered from the effects of radiation. He explained the various kinds of problems which have spread radiation, such as nuclear weapon testing, nuclear production, nuclear accidents as well as nuclear waste, and pointed out their negative impact on society.

These lectures will be translated into Japanese and published in the HPI booklet Vol. 8 in July 2022. Both the Japanese booklet and this English report can be downloaded from the website of the Hiroshima Peace Institute. A short report on the whole lecture series will also be available in the HPI newsletter on the website. We sincerely hope that these lectures will be useful for students, academics and citizens who study and work for peace.

May 2022  
Makiko Takemoto  
Associate Professor at HPI



# **The February 2021 Military Coup in Myanmar: Its Impact on Domestic Politics and Foreign Policy**

**Narayanan Ganesan**

**Professor at Hiroshima Peace Institute**

## **Introduction to Myanmar**

Myanmar is located in the extreme top left of mainland Southeast Asia. It was colonized by the British as an extension of their empire in India following three major Anglo-Burmese Wars that ended in 1888. Despite the victory over the monarchy and native residents, the colonial authorities were unable to rule the entire country and limited their governance to the lowland delta areas while signing treaties with the highland elites in areas that were heavily forested and posed the threat of malaria. Additionally, the country was home to ethno-linguistic heterogeneity with the British cataloguing 135 ethno-linguistic groups in 1939 prior to the outbreak of World War II. The majority Bamar ethnic group that comprised about two-thirds of the population lived primarily in the lowland areas while the ethnic minorities occupied the highlands.

Following the end of World War II, the British were keen on negotiating independence for many of their colonial territories and Burma was similarly offered independence early on in 1948. However, independence came without territorial consolidation since the British were unable to weld the country geographically prior to independence. Similarly, the post-independence government was unable to exert control and govern over the entire country. Additionally, the presence of a large Chinese Kuomintang army that was trapped in the northern Shan states of the country also meant that the area was subjected to international conflict through a proxy war between the United States and China.

Burma drifted towards ethno-linguistic insurgency against the central government from early on, and the government of Prime Minister U Nu exaggerated the situation by tending towards Bamar Buddhist nationalism. The disaffection among the minority groups eventually led to a first military coup in 1958 that lasted for 18 months and a second in 1962 that ousted the civilian government and introduced



military rule. The coup that was led by Ne Win relied on an ideology of radical socialism and opted for a policy of passive neutrality premised on isolationism. In the decades following the coup major industries were nationalized leading to an outflow of investments and local professionals. As a result, the country's economy and development deteriorated badly.

Ne Win relinquished power in 1988 and the affiliated Burma Socialist Programme Party (BSPP) government collapsed in 1988. The collapse of the government coincided with widespread demonstrations for democracy in major urban cities that was violently crushed by the military leading to the death of some 3,000 protestors. Subsequently, the military junta in power held nationwide elections in 1990 that was overwhelmingly won by Aung San Suu Kyi and her National League for Democracy (NLD) party. Suu Kyi, who had returned to the country in 1988 to care for her ailing mother, was the daughter of independence hero General Aung San who led the movement for independence against the British.

The military junta in power ignored the outcome of the elections and imprisoned many politicians from the NLD including Suu Kyi who was regularly detained under house arrest. In 1994, General Than Shwe who led the junta announced a seven-point roadmap to democracy and convened national conventions that eventually paved the way for a new Constitution that was promulgated and swiftly endorsed in 2008 against the backdrop of the devastation caused by Cyclone Nargis that killed some 135,000 people. In 2010 General Than Shwe stood down from power and the military junta held nationwide elections that installed a new government headed by President Thein Sein who was from the military. Thein Sein drew on a large number of senior military officers who similarly switched to civilian garb and manned the cabinet through the Union Solidarity and Development Party (USDP) that was formed by the military prior to the elections. Suu Kyi and the NLD boycotted the 2010 elections that was widely regarded as rigged in favour of the USDP.

## **The semi-democratic period and lead up to the coup**

The period from 2010 to 2020 is often regarded as a semi-democratic period. The reason for this assessment is the transition towards more democratic and liberal norms that included the freeing of most political prisoners, the right of political

exiles to return without persecution, liberalization of the mass media, the start of ceasefire negotiations with 16 ethnic armed groups and a generally more liberal political and economic climate. These reforms by the Then Sein government were reciprocated by Western countries through the lifting of an international sanctions regime that had been in place since 1990 and broadened from 2003.

Against the momentum associated with political liberalization and international recognition of the newly elected government Thein Sein invited Suu Kyi to the capital Naypyitaw in August 2011 that led to a thaw in relations between the incumbent government and the NLD. Subsequently, the NLD was allowed to reregister as a political party and competed in the 2012 April by-elections where it handsomely won 43 out of the 45 seats that it contested. Following on from this spectacular showing Suu Kyi became the leader of the opposition and her aura and political prestige grew immensely. In the second and 2015 November elections the NLD won an overwhelming victory again and was able to form the government without support from other parties. Both Suu Kyi and the NLD were able to capitalize on their performance during their second term of office and were rewarded with a third term in the November 2020 elections with an even larger majority. However, this turned out to be a pyrrhic victory since army chief General Min Aung Hlaing staged a coup on 1 February 2021 before the NLD could assume office for the next 5-year term.

### **Issues central to the coup**

A number of factors that were central to the coup can be discerned by reviewing Myanmar's recent political history. The first and perhaps most important trigger for the coup was the clearly waning popularity of the military's political party, the USDP. The trend in the election results of the two elections held after 2010 in 2015 and 2020 makes it very clear that the electorate voted overwhelmingly against the USDP. Conversely, the NLD that was led by Suu Kyi garnered the lion's share of the vote. This displacement effect of the waning popularity of the USDP and the corresponding popularity of the NLD left the military frustrated that its political vehicle to ensure its relevance in domestic politics was being severely undermined within a democratic environment. In fact, during the 2020 elections many analysts had originally predicted that the smaller parties representing the minority ethnic groups would secure sufficient votes to play the role of king maker and force the NLD to coopt them in order to achieve a majority in parliament. However, this fear

was unfounded since the NLD was returned with an even larger majority in the 2020 elections. Consequently, it was clear that if the ongoing trajectory of developments were to be sustained, the NLD would overwhelm the domestic political scene and parliament.

The second issue that the military found irksome was the personal appeal of Aung San Suu Kyi. She held a very strong personal appeal to the electorate and commanded the kind of moral and political attraction that was unmatched in the country. She was popularly referred to as Ameh (Mother) Su and drew large crowds wherever she went. This almost personality cult that surrounded her was never broken from 2012 when she entered parliament and only became stronger. The NLD truly personified her and all other office holders in the party could not claim similar legitimacy notwithstanding many complaints that she was a micro manager and that her style was stifling bureaucratic efficiency. The military hated her for this popularity and its 25 percent of appointed members in parliament rose in unison to protest the creation of the rank of State Counselor that she subsequently appropriated to bypass the rules of the 2008 Constitution that forbade her from holding the position of President of the country. Through this structural change Suu Kyi was able to place her own confidants as Presidents and rule the country indirectly.

What infuriated the military was also Suu Kyi's repeated attempts to revise the 2008 Constitution that structurally empowered the military in domestic politics through the assignment of seats without electoral contest and the control of important ministries in the government (to be discussed in the next section). Through her leadership the NLD formed several committees to recommend important revisions to the Constitution that would have deprived the military of such automatic appointments. Again, the military appointees in parliament clearly opposed such attempts and one of General Min Aung Hlaing's favourite and oft repeated phrases was that all actions should be "according to the Constitution." Suu Kyi understood that parliament was the only venue to attempt to modify the Constitution and even though she failed on the basis of inbuilt constraints to such changes the actions had a clear demonstration effect on the electorate. In fact, amendment of the Constitution was one of the NLD's campaign promises during the 2020 elections. Suffice it to say then that her actions were regarded by the military as an affront to its claim to political power based on a Constitution that was skewed in its favour. Suu Kyi's efforts demonstrated to the public in general that the Constitution was not a demo-

cratically inspiring document. Such thinking was heretical to the military that sought to institutionalize its presence in the country's political process indefinitely. It also undermined the military's claim to be the guardian of democracy and the country at large when the document that its power was vested on was so openly challenged.

During the NLD's term of office from 2015 when it won an overwhelming majority in parliament Suu Kyi refused to convene the National Defence and Security Council (NDSC). The Council which had a total of 11 members was composed in favour of the military that held 6 out of the 11 appointments to it. Suu Kyi realized that the NLD government would be easily outvoted in such a situation notwithstanding having won the elections and holding an overwhelming majority in parliament. The military regularly called for the NDSC to be convened especially when the security situation in parts of the country like Rakhine state was problematic owing to widespread conflict with the Arakan Army (AA). Suu Kyi realized that the military would use such an opportunity to simply declare a state of emergency and rule by martial law. This development would have left the government unable to control developments in such areas. Consequently, her preferred approach was to declare a state of emergency in townships affected by conflict and retain control over governance rather than convening the NDSC and transferring political power to the military.

A combination of all the issues highlighted in this section is what made the military decide on staging a coup against the elected NLD-led government to return to power just like the situation before 2010. The consistent and progressively enlarging power base of the NLD and the concurrent diminution of the USDP left the military with little option except to reverse the ongoing political process if it wanted to retain power. Hence, notwithstanding the observation by many international and local monitors that the 2020 elections were carried out fairly the military alleged widespread voter fraud and chose to stage a coup to deny the NLD its electoral victory—a situation reminiscent of the military's refusal to acknowledge the NLD victory in 1990. The earliest signal of an impending coup was the delayed sitting of parliament in January 2021 and the attempts by General Min Aung Hlaing to negotiate a situation favourable to himself and the military. Subsequent pronouncements by President Win Min indicated that the military had asked for his resignation so that his office could be filled by someone else. The collapse of discussions between

General Min Aung Hlaing and the NLD leaders was the final straw that led to the staging of the coup. Since then, most senior leaders of the NLD have been charged with various crimes and held in isolation or imprisoned—again a situation akin to that prior to the onset of democratic reforms in 2010.

### **Structural norms favouring the military**

In the earlier section it was mentioned how the 2008 Constitution that was promulgated by General Than Shwe in 2008 and then swiftly ratified at the end of that year contains many provisions that favour the military and entrench it as an institution within the domestic political process. The first and foremost of these provisions is the one that automatically allocates 25 percent of all seats in regional and the federal parliament to representatives of the military. What this effectively means is that only 75 percent of all seats available in parliament are actually contested. Tied to this proviso is another that requires a super majority of more than 75 percent of members of Parliament to approve any changes to the Constitution. Since the military always votes as a bloc in favour of its own corporate interest this second requirement effectively means that the Constitution is immune to any changes in parliament which is why all the recommendations of committees in parliament for such reform were easily defeated. Over and above these two requirements one out of the three Vice Presidents from which the President is selected must come from the military.

Another major provision to entrench the military is that the Ministries of Border Affairs, Defence and Interior are controlled by the military. In other words, Ministers representing these three ministries are automatically nominated by the military. Additionally, and importantly, the military and its budget is also not subjected to parliamentary scrutiny. This freedom from scrutiny goes against the classic democratic principle of civilian supremacy over the military. As mentioned earlier, the military controls 6 out of 11 seats in the NDSC that can be invoked to deal with threats to law and order and reinstate public security. Finally, and perhaps most importantly, the 2008 Constitution allows the military to stage a coup and take power from an elected civilian government in the face of a threat to national security. It was this clause that General Min Aung Hlaing invoked in defence of the coup to save the country and its citizens from alleged massive electoral fraud. Another caveat in the Constitution that is often regarded as being specifically written to

target Suu Kyi is the one that bars local citizens from assuming the office of the President if their spouses or children are foreign nationals. Suu Kyi's husband was British and her two children also carry British passports, which is why she never held the appointment of President despite leading the NLD to victory in 2015.

The military also has control over a large number of state-owned enterprises. These are collectively held through a number of omnibus organizations that in turn fund the military. The largest of these is Myanmar Economic Holdings Limited (MEHL) and Myanmar Economic Corporation (MEC). Additionally, the military also controls the Myanmar Oil and Gas Enterprise (MOGE) that has in recent years provided much by way of funding through the extraction and sale of oil and gas abroad. All these holding companies provide the Myanmar military with a steady flow of cash and were put in place by the government of Ne Win after the 1962 military coup that resulted in the nationalization of industries.

### **Impact of the coup on domestic politics**

The 2021 coup had a deleterious effect on the nascent emergence of democracy in Myanmar that began with a semi-civilian government in 2010. While there were structural rules in the 2008 Constitution that prohibited a fully functioning democracy, the short democratic experiment had unleashed tremendous support for Suu Kyi and the NLD government. The popularity of both the party and its leader rose immensely and there was nothing that the military could do to reverse the process. If anything, the coup was meant exactly to arrest the surging fortunes of the NLD and find some way of salvaging the sagging fortunes of the USDP and its military sponsors. In this regard, the annulment of the 2020 election results dealt a mortal blow to the democratic process and its consolidation and reverted the country back to the period of military rule before 2010.

The military swiftly arrested President Win Min and State Counselor Suu Kyi and held them incommunicado at an undisclosed location. Subsequently, a number of charges were levelled against them including breaking curfew rules related to the coronavirus when campaigning and corruption. Charges were added over time and prison sentences meted out for them slowly with many more pending including the continued addition of new charges. Similarly, ranking members of the NLD government and cabinet were also arrested and imprisoned. A state of emergency was

declared from the date of the coup and it was just extended for another 6 months in February 2022. Civil liberties have been suspended and the military has carried out a ruthless campaign of killing those opposed to the coup and detaining over 11,000 persons many of whom were tortured. At the time of writing some 1,500 citizens have died in the year following the coup. The military has promised to hold a “free and fair” election at an appropriate time which is a code word for disallowing the NLD and its office bearers to compete and rigging the situation to ensure that the USDP will win the elections. It is expected that the newly installed Union Election Commission will disband the NLD prior to the elections on the basis of the earlier fraud claims that led to the coup in the first place. Additionally, it has just now introduced proportional representation in parliament that is intended to favour the military and its proxy party.

From the day of the coup there has been widespread resistance to it from the general public including civil servants. The resistance began in the form of organized marches opposed to the coup at the outset and the banging of pots and pans which is a traditional way of indicating unhappiness. Subsequently the resistance became much more organized and led to the emergence of a civil disobedience movement (CDM). Large numbers of people took part in the movement and daily life came to a grinding halt. The three fingers salute which is popularly used in Thailand to indicate resistance to the government of general Prayuth Chan-ocha that also came to power through a coup in May 2014 was adopted by the CDM. Ministries began openly defying the military junta and organizing and publicizing their resistance on social media sites. The education and health sectors were especially active in such protests and both sectors virtually collapsed in the country. Those from the younger generation in their teens and 20s made it very clear that they were opposed to the coup and prepared to fight the military even if it meant risking their lives in the process. Over time elements from the CDM became much more organized and armed and began attacking police and military personnel.

Following a call by the NLD government in exile to take up arms against the military junta, many members of the CDM morphed into much better organized People’s Defence Forces (PDF) and started staging daring attacks on military convoys through the use of improvised explosive devices that were followed by ambushes. Since the start of the coup the military has been strongly and violently attacked especially in Chin, Kayah, Magwe and Karen states. The military is unac-

customed to this level of resistance and violent attacks against it and has responded through indiscriminate violence and the torching of houses and villages. It has also called in air support in the form of fighter aircraft and helicopter gunships to try and defend itself during and after large engagements. Finally, it has armed and trained civilians as part of a paramilitary militia group called Pyu Saw Htee to support it and fight against the PDFs as well. Such fighting has led to a large number of internally displaced persons (IDPs) within the country in states and regions where there has been protracted resistance and fighting.

Concurrently the NLD announced from early on the setting up of a parallel government in exile called the Committee Representing Pyidaungsu Hluttaw (parliament) or CRPH. This body regularly issues press statements and together with some of the ethnic armed groups the CRPH has also created a larger body called the National Unity Government (NUG). Both these organizations actively participate in domestic politics as well as international affairs by claiming to be the rightfully elected government and have been recognized by many Western countries, like the United States and those from the European Union. Australia, Canada, New Zealand and the United Kingdom, member countries of the Commonwealth, have also recognized these organizations.

Earlier in this section it was suggested how the education and health sectors in Myanmar have collapsed as result of widespread support for the CDM. Additionally, the economy and the banking sector have also come to a screeching halt. Many foreign investors have withdrawn from the country especially from the manufacturing sector and oil and gas industries. There has been a run on the banks, and they have been unable to keep up with the demand to draw out savings from deposit holders. To worsen the situation, the Myanmar Kyat currency has also collapsed against foreign currencies and is now worth less than half its value a year into the coup. So, for example, it was trading at about 1,260 Kyats to the US dollar before the coup and is now trading slightly below 3,000 kyats to the dollar. The military junta is also facing a cash crunch since many residents in the country have refused to pay their bills for utilities like water and electricity. PDF groups have also been active in attacking assets belonging to the military and these have included factories and telecommunication towers. A combination of all these factors has also meant that the inflation rate is now very high.



Finally, the peace process with the Ethnic Armed Organizations (EAOs) that was started by the Thein Sein government in 2012 and which culminated in the Nationwide Ceasefire Agreement (NCA) that engaged 8 out of the 16 ethnic armed groups in the country has collapsed. The NCA achieved partial success under the first NLD-led government when two more EAOs signed on to it. However, the coup has unraveled the document and the process altogether. Major EAOs like the Karen National Union (KNU) and the Restoration Council of the Shan State (RCSS) are now engaged in open conflict with the military. More importantly, the larger groups like the KNU and the Kachin Independence Organization/Army (KIO/A) have also helped to train members of the PDF in the areas that they control, much to the chagrin of the military. Additionally, the convergence of interests between the two groups has resulted in collaboration at the ground level in terms of staging coordinated and joint attacks against the military.

### **Impact of the coup on international relations**

The 2021 coup in Myanmar attracted swift and strong retaliatory action from the international community and Western countries at the outset. The European Union which was a major sponsor of the ethnic peace process swiftly imposed economic sanctions on the country that included an embargo on trade and economic investments. The United States adopted a similar policy together with other like-minded countries like Australia, Canada, New Zealand and the United Kingdom. These sanctions were subsequently expanded over time to target those who were perceived as being directly involved in the military coup and the affiliated administration afterwards. Additionally, there were widespread calls to release those from the previous NLD government that had been imprisoned and a restoration of democracy based on the outcome of the 2020 elections. At the international level the United Nations whose special envoy to the country had long been denied access to the country was replaced with a Singapore national. Hopes were raised that she may assist to broker the situation given her familiarity with the country, the military junta and coming from the region. However, thus far her efforts have also come to naught and the military government has actually shut down the office of the UN special envoy in the capital city of Naypyitaw.

The Association of Southeast Asian Nations (ASEAN) attempted to broker the situation by undertaking regional initiatives. Indonesia, which is *primus inter pares* in

the grouping, hosted the first meeting of regional leaders that included General Min Aung Hlaing. That meeting led to an agreement that Myanmar would accede to a 5-point plan to deal with the domestic political situation. Subsequently, Brunei convened a meeting of foreign ministers to deal with the situation as the rotating chair of the organization. The country's second minister for foreign affairs was appointed the special ambassador to deal with the military government and see to the implementation of the 5-point plan. The appointment of the ASEAN envoy was delayed since a number of countries including Indonesia, Malaysia and Thailand also offered initial candidates for the envoy position. Notwithstanding the subsequent appointment the plan and agreement came to naught since the Myanmar military refused the envoy access to Suu Kyi in order to try and broker the situation.

In 2022 Cambodia now holds the ASEAN chair and Prime Minister Hun Sen attempted to mediate the situation on his own with a trip to the country where he met with General Min Aung Hlaing. After that the country's own foreign minister was appointed as the new ASEAN special envoy and there was an attempt to host the ASEAN foreign ministers meeting in late January that included the minister from Myanmar. Citing difficulties travelling during the corona virus-linked restrictions, many ASEAN ministers subsequently declined attending the meeting. It then became clear that the organization was unwilling to go along with Hun Sen's plan to engage the Myanmar military government without progress at the ground level on the implementation of the 5-point agreement. Singapore's Prime Minister Lee Hsien Loong openly called for more progress on the plan before any resumption of engagement with the junta. Malaysia and Indonesia also voiced dissatisfaction with the stalemated situation.

Notwithstanding the negative responses to the Myanmar military coup from ASEAN and Western countries, both China and Russia have offered Myanmar diplomatic and material support. China that has traditionally never abided by conditionalities for trade and investments continued supporting the post-coup government. It has also expressed interest in the protection of its investments and interests in the country including the oil and gas pipeline from Kyaukphyu in Rakhine state to Kunming in Yunnan province in China that became operational in 2017. China has traditionally offered Myanmar strong diplomatic and material support when the latter was subjected to wide ranging international sanctions prior to 2010. Russia has also supported the Myanmar military junta and has had high level exchange of

visits and supplies weapons and parts to the country and its air force. The support of both these major powers has helped Myanmar to stave off some of the criticisms at the international level.

## **Likely future trajectories**

The ongoing political situation in Myanmar is clearly indicating deterioration over time. Fighting between the PDFs units and often in coordination with the EAOs and the military has become much more intense and widespread. It would be fair to note that the country is steadily drifting in the direction of civil war and that the military is losing control of large swathes of territory in a number of states and regions. Additionally, this time around the violence has also spread to the urban cities of Yangon and Mandalay. What is perhaps more important is that many of the younger recruits of the PDF are from the Bamar majority who have drawn common cause with the ethnic minorities and their grievances against the military. This situation is unprecedented in the country's history where fighting tended to be typically confined to the rural and highland areas involving the ethnic minorities. Interviews with Myanmar nationals resident in Singapore indicated the widespread thinking among locals that the military has lost its legitimacy to rule. The younger generation of fighters who are opposed to military rule have also indicated that they are prepared to fight for the long run and lose their lives in the cause if necessary. There is a constant reference to reversing the country's current trajectory and ending military rule in the country. On the other hand, the military appears to be equally prepared to continue its position and fighting the PDFs and the EAOs. The result of this intransigence between both sides is that civilians have been disproportionately affected and there are now large numbers of IDPs in the country without access to the basic necessities of life.

The domestic economy has to all intents and purposes collapsed. The local currency is worth less than half its value since the coup and the banking sector has collapsed as well. The inability of the military government to collect payments for basic services and the lesser revenue streams can only mean more difficulties over time. There are already reports of spiraling inflation and food shortages while the country remains cut off from much needed international assistance. Myanmar has become much more isolationist again just like the situation prior to 2010 and regional attempts to broker the domestic political situation have not yielded any success. In

this regard, the downward drift of the domestic political and socio-economic situation does not bode well for the medium term. In fact it appears likely that the country is headed for much more turmoil and violence before any progress obtains. Most observers are pessimistic about the country's future without some kind of break in the political impasse.

## **Conclusion**

The Myanmar military staged a coup in February 2021 and usurped power from the NLD-led government that had won the November 2020 elections with an overwhelming majority that was sufficient for the party to dominate both the upper and lower houses of parliament. The military claimed widespread voter fraud as the reason for the coup and claimed legitimacy on the basis of the 2008 Constitution in order to safeguard the country's national security. Most international observers of the elections had certified that the elections were generally conducted fairly and transparently. The coup has effectively ended Myanmar's transition from military rule that began in 2010 that tended in the direction of democracy. There has been widespread regional and international criticisms of the coup and a call for the return of the elected civilian government into office. Additionally, many countries have also subjected Myanmar to economic sanctions.

The military has indicated that it will not reverse the coup and claims to be working towards the restoration of "free and fair" elections that is widely interpreted as a rigged election that favours its own party the USDP while marginalizing the NLD whose popularity it has been unable to contain. In this regard the military is working towards institutionalizing its own power just like the situation before 2010. The ousted NLD government has created a parallel government that has been recognized by many Western countries as the legitimate government of Myanmar. This CRPH government in exile has also joined forces with many ethnic armed groups to form the NUG. Both the CRPH and NUG regularly issue statements and attempt to guide the resistance against the military.

The coup has triggered strong resistance from the domestic population as well that began with the CDM that has since morphed into the PDF that regularly engage the military and often in collaboration with the ethnic armed groups. The KNU, Karenni National Progressive Party (KNPP) and the Kachin Independence Organization

(KIO) have trained young recruits from the PDF and staged attacks on the military. This collaboration is likely to continue since many youths from the younger generation think that this is a historic opportunity to rid the country of military rule. This stalemated situation means that much more violence is likely to occur and lead to the displacement of a large number of civilians as IDPs. The military has resorted to indiscriminate attacks against civilians when attacked including the use of aircraft to bomb villages and opposition fighters.

The ethnic peace process that was inaugurated by the Thein Sein government in 2012 culminating in the Nationwide Ceasefire Agreement (NCA) in 2015 has effectively come to an end. The domestic political situation has caused consternation within ASEAN that is trying to help resolve the situation, but this effort has not yielded any visible success. ASEAN has thus far refused to recognize the military government even as Cambodia that now holds the ASEAN chair is attempting to broker the situation.

# The History of the Global Hibakusha

**Robert A. Jacobs**  
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## **Introduction: Who are the Global Hibakusha?**

Hiroshima and Nagasaki were directly attacked with nuclear weapons in 1945. People suffered and died from the blast wave, the incredible heat and the radiation released by the detonations.<sup>1</sup> Both cities are, in many ways, still recovering from these attacks almost 80 years later. Nuclear weapons have never again been used in a direct attack on human beings. However, more than 2,000 nuclear weapons have been detonated by Nuclear Weapon States (NWS) since 1945.<sup>2</sup> While not used to attack people directly, the effects of nuclear explosions, and especially the explosions of thermonuclear weapons (H-bombs) are so immense that many people have experienced harm just from the testing. Additionally, millions more have been exposed to radiation from nuclear accidents, both with weapons and reactors, and also from the production of nuclear materials, especially nuclear fuel to power reactors to make both weapons and electricity. These millions of people, spread around the world, are the “global hibakusha.”<sup>3</sup>

To understand the global hibakusha, it is important to understand how people are exposed to radiation.<sup>4</sup> Here in Hiroshima, and in Nagasaki, there were two ways people experienced harm from radiation. When the nuclear weapons detonated, intense waves of energy radiated out from the hypocenter. These energies included blast waves and high heat, but also waves of gamma and neutron radiation. Similar to the blast and heat energy, the radioactive waves burst outward from the detonation and caused immense harm to those nearby. These waves remained harmful out to about 3–4 km from the hypocenter, becoming less energetic as they extended further. For all of those within this area, the waves penetrated through their entire bodies, harming cells and organs as they passed through. Radiation in this form lasted less than a minute; you can think of it like a giant x-ray, it is on, and then it is off—when it is off, there is no more radiation present. Many people were killed instantly, and many more died in the subsequent days, weeks and months from the damage done by their exposures to this external radiation; even more developed

sicknesses over the coming decades. The Atomic Bomb Casualty Commission (ABCC) and its descendant laboratory the Radiation Effects Research Foundation (RERF) have continued to track the harm to health from these exposures even today.

However, people were also harmed by the Black Rain. This was a different means of exposure to radiation. When the nuclear weapon detonated, it produced many radioactive particles called fission products. The mushroom cloud filled with these particles, along with uranium-235 or plutonium that had not split (the Hiroshima weapon used uranium-235 and the Nagasaki weapon used plutonium).<sup>5</sup> Additionally, particles were ionized by the detonation and made radioactive. All of these particles were drawn up into the mushroom cloud as the fireball of the detonation cooled: it is the presence of all this material at the top that “mushrooms” the cloud. After the attack, the mushroom cloud drifted, and as it drifted, these radioactive particles fell from the cloud and drifted to Earth. This is radioactive “fallout.” Because there was also so much soot from the fires burning in Hiroshima, when rain stripped these particles out of the drifting cloud, the rain was black. This Black Rain contained a lot of radioactive particles. Different particles have different chemistries, with some remaining radioactive only for hours or days, and other radioactive particles remaining radioactive for hundreds or thousands of years. Plutonium remains dangerous for over a million years, and uranium-235 for billions of years. These particles are primarily dangerous if they get inside of our bodies, which they do via inhalation, swallowing or cuts in the skin. Once internalized, they may be expelled from the body, or they may be retained and used by the body just like the chemicals in our food. Depending on their chemistry, the body uses them for different things. For example, strontium-90, which is produced in nuclear explosions, is similar to calcium, so when it deposits inside of the body it is most often placed in the bones or teeth like calcium would be. Individual particles do not give off high levels of energy, but if deposited inside the body, this energy affects the cells nearby 24 hours a day. Over years this can cause damage and disease. And for long-lived particles, these risks continue over multiple generations.

It has taken a long time for scientists and the courts to recognize those who were exposed to Black Rain and who developed subsequent disease as “hibakusha.” It is easy to know who was exposed to the external radiation of the nuclear detonation: whoever was within a 3–4 km area around the hypocenter. However, it is very difficult to determine who has internalized radioactive particles and who has not

after fallout deposits these particles in a community downwind. This uncertainty has made it hard for those exposed to Black Rain to be recognized as suffering from radiation exposures from the nuclear detonation.

After the end of World War Two, many people feared that the next “world war” would be fought with nuclear weapons. There were fears that many people might experience a direct nuclear attack as had the people of Hiroshima and Nagasaki. Instead, the more than 2,000 nuclear weapon tests exposed millions of people to radioactive fallout similar to those exposed to the Black Rain. Fallout, not nuclear detonations, would become the “normal” of the Cold War period. And just as it has taken a long time to acknowledge what happened to those exposed to Black Rain, the harm that has come to the global hibakusha has similarly been denied, and their suffering has similarly been rendered invisible.

## **Nuclear Weapon Testing**

The United States began testing nuclear weapons less than a year after the nuclear attacks on Japan.<sup>6</sup> They tested two weapons in June and July of 1946 in the Marshall Islands, which they held as a Trust Territory from the United Nations. They continued to test in the Marshall Islands for over 10 years, including developing hydrogen bombs with their immensely larger fallout clouds. Once the former Soviet Union developed nuclear weapons in 1949, the United States opened a second nuclear test site inside of the U.S., in Nevada. The Nevada Test Site would become the location with the most detonations of any location on Earth, more than 900 nuclear weapons. It remains an active military site today and is where the U.S. developed the depleted uranium weapons that it has used in warfare since the 1990s, which like nuclear weapons, leave residual radionuclides in the ecosystem after their use. Both U.S. test sites exposed people to significant amounts of fallout radiation. So many fallout clouds crossed the United States from atmospheric tests in Nevada that radiation can still be found today thousands of kilometers downwind. The U.S. has recently begun to pay small amounts of compensation to those who lived within 1,000 km of the test site during the period of heavy contamination, even though many born since live in areas with residual radiation that continues to pose risks to their health.

The Marshall Islands experienced vast fallout clouds, especially from hydrogen bomb testing in the mid-1950s. The test of the first functional hydrogen bomb, the



Bravo Test on 1 March 1954, irradiated hundreds of Marshallese living on atolls hundreds of kilometers away, all of whom experienced health effects. The contaminated atolls are still largely uninhabitable from the ongoing radiation levels. This test also blanketed the *Daigo Fukuryu Maru* with fallout, sickening the entire crew and resulting in the death of crew member Aikichi Kuboyama six months later. The anniversary of the Bravo Test is observed today as a national holiday in the Republic of the Marshall Islands to remember the suffering of those who died and the hardships of those who survived this disaster.

The former Soviet Union developed nuclear weapons four years after the United States.<sup>7</sup> They established their first test site in the Kazakh Soviet Socialist Republic. There they developed both fission weapons and also fusion, hydrogen bombs. Multiple villages are within 50 km of the Polygon (as the test site is known) and fallout radiation is estimated to have affected over 1,000,000 people living downwind from the test site. The Soviet Union tested in multiple other locations, including a test near the Ural Mountains that involved the participation of over 50,000 troops on contaminated training grounds. A test site was established in the late 1950s in the Soviet Arctic at Novaya Zemlya where the largest nuclear detonation in history was conducted in 1961. The Tsar Bomba had a yield that was more than three times larger than the Bravo Test, the largest U.S. test.

The next nation to test nuclear weapons was the United Kingdom.<sup>8</sup> They began testing nuclear weapons in Australia in 1952. The British tested in three locations in Australia, as well as conducting multiple tests of, what would today be called, dirty bombs. Most of these tests took place on the traditional lands of several aboriginal communities in the outback of South Australia. However, the Australian government refused to allow the British to test hydrogen bombs in Australia because of the vast fallout clouds. The British then developed a nuclear test site on Christmas Island in the Pacific nation of Kiribati. In 1957 and 1958 they tested multiple hydrogen bombs on Christmas Island. The British conducted 45 tests in total.

France began its testing of nuclear weapons in Algeria in 1960.<sup>9</sup> Long a French colony, these tests took place during the Algerian War of Independence and, knowing that they were likely to lose the war and therefore the ability to test in Algeria, even as the tests were being conducted the French were developing a second nuclear test site in a second colonial territory, French Polynesia. Here the French would

conduct almost 200 nuclear weapon tests, including all of their hydrogen bombs.

The final nation to test nuclear weapons in the atmosphere, and thus to produce downwind fallout, was China.<sup>10</sup> The Chinese tested all of their weapons at their test site in Lop Nur in Xinjian Province. There they tested 45 weapons in total, including both fission and fusion bombs.

It is clear that nuclear colonialism played an essential role in the choice of nuclear weapon testing sites. Two Nuclear Weapon States (NWS), the U.K. and France, never tested one weapon inside of the borders of their own nation; they only tested in colonial, or post-colonial locations. While the U.S. conducted tests both inside the United States and also in “trust” territories, it concentrated all of its H-bomb tests outside of the continental United States, to spare its domestic population from the larger fallout clouds produced by hydrogen bombs. Even when domestic sites were chosen, they were invariably located near ethnic or religious minority communities, far from the centers of dominant ethnic groups. In the United States this meant Native American, Hispanic and Mormon communities. In the former Soviet Union, the primary test site was in Kazakhstan, both ethnically and religiously distinct from the Russian majority. In China, all tests were conducted in the traditional lands of Uyghur people, an ethnic and religious minority who experience extreme repression even today.

Those “selected” to be irradiated were chosen because they were politically powerless to prevent it. Rather than selecting test sites based on military or security requirements, the lack of political consequences on the part of the testing nations was of primary importance. This was a form of nuclear colonialism: not a colonialism of resource extraction but a colonialism of places being considered “empty,” and being populated by “nobody.” In these “empty” spaces millions of actual people were exposed to fallout radiation by the nuclear weapon testing of the P5, and millions more remain living on contaminated lands today.

## **Nuclear Production**

To manufacture nuclear weapons, and to generate nuclear electricity are both very technologically intensive processes. These steps are collectively referred to as the “nuclear fuel cycle.” Each node of these processes has resulted in contaminations

of workers, and also of those living nearby the production sites. Also, each step of these processes generates nuclear waste: low, moderate and high-level waste. Hence each step both creates risk onsite, and also generates risk for those in the stream of waste management.

All nuclear technologies begin with uranium mining.<sup>11</sup> Uranium mining is similar to other types of mining in that uranium is a natural ore that is embedded in rock at various locations around the world, and mining, both underground and strip mining, are used to obtain the ore. The first uranium mines were at sites already engaged in mining, in which uranium became an additional ore for extraction. Many had been working silver mines. Since then, uranium mines have been dug all around the world. Once thought to be a rare ore, it is now understood to be widely distributed in abundant quantities.

The first people to be exposed to radiation in the nuclear fuel cycle are the uranium miners. Many inhale uranium particles in the closed confines of the mines, hence uranium miners have long suffered high levels of lung cancer. Miners also have tracked uranium dust into their homes on their clothing and shoes, resulting in high levels of uranium radionuclides being found in the dwellings of uranium miners and those living near uranium mines. The mining process produces a lot of waste material which is contaminated with uranium, and this is left behind beside the mines. It is called “tailings” and is either stored in large piles, or dumped into large ponds. Virtually no uranium tailing pile or pond has been cleaned up by mining companies when they have closed mines. The largest release of radiation in U.S. history was the Church Rock disaster in which a dam broke and a uranium tailing pond spilled into a nearby creek bed in New Mexico in 1979.<sup>12</sup>

Uranium is made up of several different isotopes, and only U-235 can be made to fission. U-235 makes up less than 1% of raw uranium, so the material must be refined through multiple steps to end up with uranium made up of sufficient U-235 to be usable, or as it is known—enriched uranium. The steps to obtain this material include putting it through various enrichment processes such as centrifuges or turning it into a gas to separate the U-235 from the heavier U-238 which comprises most of the raw material. The U-235 is used directly in nuclear weapons while the U-238 is used in making fuel rods to power nuclear reactors.<sup>13</sup>

Nuclear reactors were invented by the Manhattan Project. Nuclear reactors were designed and first operated as factories to manufacture plutonium for nuclear weapons.<sup>14</sup> In the Manhattan Project this was done at Hanford, Washington. The United States operated plutonium production reactors at Hanford (and later at Savannah River in South Carolina) generating sufficient material to build more than 70,000 nuclear weapons.<sup>15</sup> Plutonium is manufactured by “burning” nuclear fuel rods. Some of the U-238 is transformed into plutonium, then the fuel rods are dissolved in sulfuric acid and the plutonium is chemically separated from the other materials. The waste left behind from this process is both chemically toxic and highly radioactive. It is stored in large tanks buried into the ground. Most of this material at Hanford is still sitting in the tanks. One of the first large scale accidents at a nuclear reactor happened when an explosion occurred in just such a tank at the Mayak site in the former Soviet Union.<sup>16</sup> Mayak was where the Soviet Union manufactured plutonium for nuclear weapons. On 29 September 1957, an explosion in one of these tanks sent a plume of radiation that spread across more than 50,000 square kilometers, where more than 250,000 people lived. The area still has very high levels of radioactive particles more than 60 years later. Because the accident happened in the complex of Soviet military reactors, no information was given to local people, or the global community, about the incident or the risks to health.

A second nuclear reactor accident happened 11 days later, 10 October 1957, when a fire broke out inside of one of the reactors used to produce plutonium by the U.K. at the Windscale facility in Cumbria.<sup>17</sup> The Windscale Fire burned for three days, with smoke carrying radiation up into the winds and spreading through the atmosphere. At the time of the accident the British government acknowledged the fire but assured the public there was no danger or risk, and that little radiation had escaped the facility. Later assessments that took into account the weather and rain patterns of the time have revised the estimates of radiological distribution to show that fallout spread across most the U.K., Ireland and Northern Europe. A 2007 study estimated that the Windscale Fire releases were responsible for approximately 240 cancers and up to 200 cancer deaths in nearby downwind communities alone.<sup>18</sup>

## **Nuclear Accidents**

There were nuclear accidents in the Manhattan Project, and there have been accidents involving production and weapons since. However, the worst accidents have

been those at nuclear power plants, especially accidents involving the melting of nuclear fuel. There have been fuel melting incidents every decade since nuclear power plants began operating, but the largest accidents have been the two at Chernobyl and Fukushima.

In 1986 a combination of design flaws and human error led to an explosion in the #4 unit of the Chernobyl Nuclear Power Plant in the Soviet Union, located on the border of present-day Ukraine and Belarus.<sup>19</sup> The explosion propelled much of the nuclear fuel in the reactor core into the atmosphere, settling onto nearby land and dispersing downwind in the plume. The remaining nuclear fuel completely melted and flowed down into the basement below the reactor vessel. A fire burned in the reactor core for more than two weeks, creating an ongoing release of radionuclides that contaminated vast swaths of Europe. It took two days for the Soviet authorities to evacuate the town of Pripyat, three kilometers from the plant and hometown to most of its workforce. No news about the accident was released and those outside of the government only became aware of it when radiation monitors at a Swedish nuclear reactor picked up the particles a week later. Soviet authorities monitored the fallout cloud as it swirled around Europe. They did not cancel a May Day parade scheduled a week and half later, as the fire continued to burn, in nearby Kyiv. They did, however, seed clouds to bring the fallout down in heavy amounts onto Belarus to keep the fallout from reaching Moscow and other large cities in the Russian Soviet Republic.

Millions of people were exposed to radiation from the Chernobyl accident. Over 500,000 people worked as “liquidators,” performing labor from putting out the fire in the reactor to clearing up the reactor complex and the abandoned town of Pripyat in the ensuing years. Fallout contaminated areas all around Europe. Heavy contamination fell on Scandinavia, in Slavic communities, and in Germany, France and Italy. Extremely heavy amounts fell on Ukraine and Belarus. A large area was created as an Exclusion Zone that remains empty today, with hundreds of villages being emptied, and 100,000s of people evacuated. Special units were established in Ukraine and Belarus hospitals to deal with the widespread radiation sickness. Even today, more than 30 years later, radioactive food continues to make its way to the marketplace in Europe, including jams, mushrooms and boar.

Beyond the epidemiological consequences, one can also see the social and familial

legacies in Scandinavia. The fallout fell in heavy amounts in the traditional lands of the Sámi people, in Norway, Sweden and Finland. Sámi culture is built around reindeer herding, and because a primary food of reindeer is lichen, which is a bio-accumulator of radiation, the reindeer became, and remain very radioactive. Not only did this take a toll on the health of community members, but it began to alter community cultural practices.<sup>20</sup> It has problematized a sustainable economic, food and social system that has been ongoing for millennia.

In 2011, an earthquake and tsunami led to the full meltdown of three nuclear power plants at the Fukushima Daiichi Nuclear Power Plant in Northern Japan. The plant experienced a complete site blackout, it had no electricity to power the cooling systems that cooled both reactor fuel and spent nuclear fuel. Without cooling these fuel elements continued to heat until they melted. Fires started in the spent fuel pools where old fuel was being cooled, and the hot fuel inside the reactor vessels melted out and into the basements below the reactors. As the fuel melted it vented hydrogen gasses which built up inside the reactor buildings, and eventually led to four explosions in the days after the earthquake. Large plumes of radiation rose out of the buildings and drifted downwind, ultimately depositing immense loads of radionuclides onto the towns, rice fields, forests and mountains below.<sup>21</sup>

The government of Japan denied that any fuel melting had occurred at the plants, even though it was clear there had been full meltdowns on the 3<sup>rd</sup> and 4<sup>th</sup> days after the accident. It took the government three months to acknowledge to the public what it knew from the start. Hundreds of thousands of people were slowly evacuated from around the plant and put into “temporary” housing. Over the next two years, as the parameters of the contamination from the fallout clouds became more defined, people were evacuated from more distant areas as well.

In areas where nuclear power plant accidents occur, two particularly problematic radionuclides that are distributed in high amounts are iodine-131 and cesium-137. Iodine-131 is a relatively short-lived particle, remaining dangerous for slightly less than three months. However, it travels a fast route into human bodies, through consuming dairy products. The iodine-131 particles deposit onto fields and are consumed by cows; humans then consume dairy products made from the milk of these cows. The quick distribution of local milk into markets allows for the internalization of iodine-131 particles during those three months of danger. The body uses iodine

in the thyroid gland, and if a person internalizes particles of iodine-131, they are frequently put into the thyroid gland where they can damage nearby cells. This is particularly dangerous, as are all exposures to radiation, for children. Children's bodies are growing rapidly and damage from radiation effects development as well as harming cells or organs. Often after an accident, thyroid cancers, especially in children (but not exclusively) are the first disease presentation from internalizing fallout. This was the case nearby Chernobyl and also Fukushima.

Cesium-137 remains dangerous for approximately 300 years. It is particularly adept at migrating in an ecosystem once it has deposited, moving easily from soil to water to plants to animals. Once a significant amount of cesium-137 has deposited into an ecosystem, the contamination will remain. This presents multiple long-term problems, during the 300 years that cesium-137 remains dangerous, any wildfires will aerosolize the particles release them to spread, once again, downwind. Even when areas are "decontaminated" such as schoolyards, rice fields or homes, subsequent rains and wind will transport particles from nearby forests and soil into the area and re-contaminate them. Their long life means that they may pass through multiple individuals, outliving each one.

## **Nuclear Waste**

When towns are decontaminated in Fukushima that simply means that the contaminated material is moved to someplace else. The contaminated soil in the ubiquitous black plastic bags in the region contain soil that is still as radioactive as it was when it was filled. All of the areas where the bags are stacked are now radioactive waste sites. When a nuclear power plant that has had no problems is decommissioned and shut down, a long process begins of dismantling the building and equipment—all of it is now nuclear waste. Nuclear waste is generated at every step of the production and use of all nuclear technologies. This waste is classified as low-level, medium-level and high-level nuclear waste. The nature of the containment it must be placed in, and the length of time it must be contained differs based on these designations and the nature of the waste. The most concerning is high-level nuclear waste.<sup>22</sup>

A large portion of high-level nuclear waste is spent nuclear fuel rods from the operation of nuclear reactors, to produce either plutonium for weapons or electricity.<sup>23</sup>

Spent nuclear fuel rods have a very high temperature, and also extremely large amounts of both chemical toxins and radioactive particles. They all contain heavy amounts of uranium and plutonium, both of which will remain extremely dangerous for hundreds of thousands and even millions of years. These must be contained sufficiently that they do not come into contact with water or living creatures for millennia. Currently there are almost 300,000 metric tons of spent nuclear fuel, with thousands of additional tons generated every year in the world. Some of these spent nuclear fuel rods date back to the reactor that produced the plutonium for the weapon used in the nuclear attack on Nagasaki in 1945.

The global consensus on how to contain spent nuclear fuel is to build vast underground storage sites, known as deep geological repositories (DGRs). The concept is to build containment structures 500 meters underground, place the spent nuclear fuel in copper canisters and fill the facility in with bentonite clay, a form of clay that expands when it is wet. To date, not one spent nuclear fuel rod has been placed into a DGR.<sup>24</sup> The only fully developed facilities are in Finland and Sweden, where spent fuel is expected to begin to be placed into storage in the next 10–20 years. The Onkalo site in Finland, which will hold the spent fuel from the small Finnish complex of four nuclear reactors, was one of the largest construction sites in Europe for the more than 20 years. Building such sites for the hundreds of global reactors, plus the spent nuclear fuel from plutonium production by NWS will be a massive worldwide construction effort that will have a substantial carbon footprint.

Additionally, we imagine we are building facilities that will successfully contain this spent nuclear fuel for over 100,000 years. This period of time is longer than modern humans have lived anywhere except our origins in Africa. We have only had agriculture for 10,000 years, and only had electricity for less than 300 years. Believing we can design and build canisters that will contain hot, toxic and radioactive fuel rods for tens of thousands of years is certainly not assured, no matter how successful any experiments we conduct in laboratories indicate they may be. Nothing built by human beings has lasted one twentieth of that time period. Believing we will build underground structures that will remain intact, impenetrable and unchanging for 100,000 years is aspirational at best. We have created immense amounts of the most toxic materials ever manufactured which will be a part of our descendants' world. We hope we are not poisoning them, but we won't know if we are. Among the global hibakusha may be untold generations of future human beings,



and other creatures, who will have to share their world with our waste.

In our times, the testing of thermonuclear weapons brought radioactive fallout into the upper atmosphere, the troposphere and the stratosphere. There, the particles spent years circling the earth before they slowly fell out to surface of the planet. This had the effect of globally distributing much of the fallout. Currently, fallout from global nuclear weapon testing can be found everywhere on Earth.<sup>25</sup> A 2011 study of the soil three kilometers from Ground Zero in Nagasaki found more radionuclides present from global nuclear testing than from the direct nuclear attack there in 1945.<sup>26</sup> Fallout has been found everywhere from Mount Everest, to the South Pole to the Mariana Trench. Areas nearby to nuclear test sites, or nuclear accident sites have higher levels of fallout because they experienced the immediate fallout of particles in the lower levels of the atmosphere, but the fallout that entered the upper atmosphere was distributed throughout the ecosystem. Even as early as 1953, a secret U.S. government study of the bones and teeth of 20,000 subjects collected from around the world showed a global uptake of radionuclides from weapon testing.<sup>27</sup>

## **Conclusion**

In Hiroshima and Nagasaki in 1945, 100,000s of people were exposed to radiation, both externally through being close to the detonation of nuclear weapons, and many also internalized radioactive particles resulting from the explosion. Thousands more internalized fallout particles that fell in the Black Rain, or downwind from the hypocenter in Nagasaki.<sup>28</sup> Over the subsequent decades, millions more were exposed to radioactive fallout and have internalized radionuclides and experienced sickness and early mortality. Many more have undergone forced displacement from their lands after they were contaminated by radioactive fallout, or have had to depend on contaminated land and seas for the foods they feed their families.

The long-lived nature of these particles means that the risk to human beings, and all creatures, from internalizing radionuclides stretches for many generations in the future. Additionally, the presence of our nuclear waste in the future will subject unknown numbers of people to risks from exposure to radiation for longer than we can imagine. Yet we continue to generate more nuclear waste each year, and the nuclear weapon states are all engaged in modernization programs that will extend

the threat of nuclear warfare, and the production of nuclear weapons for decades into the future. This has all been a tragedy, and we are continuing down a tragic road. The ratification of the *Treaty on the Prohibition of Nuclear Weapons* may help us to turn in a different direction, but we need to strategize how to compel compliance by the nuclear weapon states, none of whom have ratified the treaty.<sup>29</sup> Even so, the waste is already here.

As the generation of hibakusha passes here in Hiroshima and in Nagasaki, we all struggle with how to maintain the memory of what they endured and what happened. There are many paths to maintaining and passing on that memory to new generations. Fortifying the bonds between Hiroshima, Nagasaki and the global hibakusha communities helps to broaden and globalize this memory work. People all over the world can testify to the harm done by exposure to radiation, and the risk to living with radiological contamination. This does not limit the need to universally understand what happened in Hiroshima and Nagasaki, but expands this understanding to include the millions more who also suffered from nuclear technology, and the many more who surely will as we continue to produce these materials and the inevitable waste that it generates.

While many global hibakusha are exposed to radiation, the long life of many radio-nuclides extends the risk and damage that the production and testing of nuclear weapons, and the legacy of nuclear accidents far into the future. The concept of the global hibakusha includes generations of people not yet born, from places far away from nuclear test sites and accident sites, who may come to encounter, and internalize the material scattered across the planet by the careless use of nuclear technologies.

## Notes

- 1 Masao Tomonaga, “The Atomic Bombings of Hiroshima and Nagasaki: A Summary of the Human Consequences, 1945–2018 and Lessons for *Homo sapiens* to End the Nuclear Weapon Age,” *Journal for Peace and Nuclear Disarmament* 2: 2 (2019): 491–517.
- 2 Daryl Kimball, ed., *The Nuclear Testing Tally: 1945–2017* (July 2020): <https://www.armscontrol.org/factsheets/nucleartesttally> (accessed 25 February 2022).
- 3 For a full elaboration of the issues discussed in this article, see, Robert A. Jacobs, *Nuclear Bodies: The Global Hibakusha* (New Haven: Yale University Press, 2022).

- 4 United Nations Scientific Committee on the Effects of Atomic Radiation, *Sources, Effects and Risks of Ionizing Radiation* (New York: The United Nations, 2018).
- 5 Ritsu Sakata, et al, “Long-Term Effects of the Rain Exposure Shortly after the Atomic Bombings in Hiroshima and Nagasaki,” *Radiation Research* 182 (2014): 599–606.
- 6 For an overview of U.S. nuclear testing see, “U.S. Nuclear Testing from Project Trinity to the Plowshare Program,” in, Abby A. Johnson, et al, *For the Record: A History of the Nuclear Test Personnel Review Program, 1978–1986* (Washington DC: Defense Nuclear Agency, 1986).
- 7 For an overview of Soviet nuclear testing see, Stephen J. Blank, ed., *Russian Nuclear Weapons: Past, Present, and Future* (Carlisle, PA: U.S. Army War College, 2011).
- 8 For an overview of U.K. nuclear testing see, Roger Cross, *Fallout: Hedley Marston and the Atomic Bomb Tests in Australia* (Kent Town: Wakefield Press, 2001), and, Lorna Arnold, *Britain and the H-Bomb* (New York: Palgrave, 2001).
- 9 For an overview of French nuclear testing see, Jean-Marie Collin and Patrice Bouveret, *Radioactivity Under the Sand: The Waste from French Nuclear Tests in Algeria* (2020): <https://www.boell.de/sites/default/files/2020-07/Collin-Bouveret-2020-Radioactivity-Under-The-Sand.pdf> (accessed 25 February 2022); Bengt Danielsson, “Poisoned Pacific: The Legacy of French Nuclear Testing,” *Bulletin of the Atomic Scientists* 46: 2 (1990): 22–31.
- 10 John Wilson Lewis and Xue Litai, *China Builds the Bomb* (Stanford: Stanford University Press, 1988).
- 11 See, Michael A. Amundson, *Yellowcake Towns: Uranium Mining Communities in the American West* (Boulder: University Press of Colorado, 2002).
- 12 Linda M. Richards, “On Poisoned Ground,” *Distillations* (Science History Institute, 2013): <https://www.sciencehistory.org/distillations/on-poisoned-ground> (accessed 25 February 2022).
- 13 Amy F. Woolf and James D. Werner, “The U.S. Nuclear Weapons Complex: Overview of Department of Energy Sites,” *Congressional Research Service* (Washington DC: CRS, 2021).
- 14 Robert Jacobs, “Born Violent: The Birth of Nuclear Power,” *Asian Journal of Peacebuilding* 7: 1 (July 2019): 9–29.
- 15 USDOE, *Plutonium: The First 50 Years* (Washington DC: Department of Energy, 1996).
- 16 Per Högselius, “The Decay of Communism: Managing Spent Nuclear Fuel in the Soviet Union, 1937–1991,” *Risks, Hazards, & Crisis in Public Policy* 1: 4 (2010): 83–109.
- 17 Lorna Arnold, *Windscale 1957: Anatomy of a Nuclear Accident* (London: Macmillan, 1992).
- 18 J. A. Garland and R. Wakeford, “Atmospheric Emissions from the Windscale Accident of October 1957,” *Atmospheric Environment* 41 (2007): 3904–3920.
- 19 Kate Brown, *Manual for Survival: A Chernobyl Guide to the Future* (London: Allen

- Lane, 2019).
- 20 Sharon Stephens, “Physical and Cultural Reproduction in a Post-Chernobyl Norwegian Sami Community,” in, Faye D. Ginsburg and Rayna Rapp, eds., *Conceiving the New World Order: The Global Politics of Reproduction* (Berkeley: University of California Press, 1995): 272, 278.
  - 21 Majia Holmer Nadesan, *Fukushima and the Privatization of Risk* (London: Palgrave MacMillan, 2013).
  - 22 Claire Corkhill and Neil Hyatt, *Nuclear Waste Management* (Bristol: IOP Publishing, 2018).
  - 23 National Research Council, *End Points for Spent Nuclear Fuel and High-Level Radioactive Waste in Russia and the United States* (Washington DC: National Academies Press, 2003).
  - 24 SKB, “Spent Nuclear Fuel for Disposal in the KBS-3 Repository,” *Technical Report 10–13* (Stockholm: Svensk Kärnbränslehantering AB, 2010).
  - 25 Remus Pravalie, “Nuclear Weapons Tests and Environmental Consequences: A Global Perspective,” *Ambio* 43 (2014): 729–744.
  - 26 Yasuyuki Taira, et al, “Current Concentration of Artificial Radionuclides and Estimated Radiation Doses from <sup>137</sup>Cs around the Chernobyl Nuclear Power Plant, the Semipalatinsk Nuclear Testing Site, and in Nagasaki,” *Journal of Radiation Research* 52 (2011): 88–95.
  - 27 *Project Sunshine: Worldwide Effects of Atomic Weapons* (Santa Monica: RAND, 1953).
  - 28 See, Shunzo Okajima, “Exposure of Nishiyama Residents in Nagasaki to Radioactive Fallout Investigation of Behavior Immediately after the A-bomb,” in, *US-Japan Joint Reassessment of Atomic Bomb Radiation Dosimetry in Hiroshima and Nagasaki: Final Report* Vol. 2 (Hiroshima: RERF, 1986): 340–341.
  - 29 Office for Disarmament Affairs, *Treaty on the Prohibition of Nuclear Weapons* (New York: United Nations, 2021).

