

Fangataufa and Moruroa, French Polynesia

Nuclear weapons test sites

Nearly 200 nuclear tests were conducted on Fangataufa and Moruroa atolls, severely contaminating the environment of the archipelago and exposing its population to dangerous radiation levels.



“Operation Licorne” on Fangataufa in 1970 was the fourth and largest French nuclear test on the atoll with an explosive power of 914 kilotons of TNT equivalent. 3,700 soldiers deployed on the neighboring atoll Moruroa had to be evacuated. Photo credit: French armed forces.



French nuclear testing base on Moruroa Atoll. During a protest voyage to Moruroa in 1985, the Greenpeace ship “Rainbow Warrior” was sunk by the French secret service in the harbor of Auckland, New Zealand, killing one person. Photo: © Greenpeace/Daniel Beltrá.



About 5,000 people lived in the region around the test sites during the three decade long era of testing. Moruroa and Fangataufa were severely affected by radioactive fallout, surrounding islands were also contaminated. Many Polynesian people working on Moruroa und Fangataufa became ill after they had returned to their home islands; oftentimes, their offspring have also been affected. Photo credit: Raivavae-Atoll, 1966, Alain Treboz, creativecommons.org/licenses/by-nc-nd/3.0



History

Despite international criticism, the French government conducted an estimated 193 to 198 nuclear tests on the French Polynesian atolls of Moruroa and Fangataufa between 1966 and 1996: 41–44 atmospheric and approx. 154 underground tests. The exact number of tests is still classified information.¹ At first, bombs were detonated on boats in the lagoon, but due to high radioactive fallout resulting from the low burst altitude, further tests were performed with warheads hanging under balloons. After 1975, testing was moved to deep shafts, dug into the atoll's basalt core, due to massive international protests.

During the three decades of testing, about 5,000 people lived within a 1,000 kilometer radius of the nuclear test site. The atolls of Mangareva and Tureia, 100 km away, were most severely affected by radioactive fallout and had to be evacuated due to high levels of radiation in 1968.² Several accidents added to the radioactive exposure of the population: in July 1966, a nuclear bomb broke apart on the surface of Moruroa, dispersing large amounts of plutonium-239.¹ A 120 kiloton nuclear detonation in July 1979 caused an underwater landslide on Moruroa, released large amounts of radioactivity into the ocean and resulted in a tsunami, wreaking havoc on many islands in the archipelago.^{1,3} In the spring of 1981, cyclones hit Moruroa, washing radioactive waste into the ocean, including much of the plutonium released in 1966.¹

Health and environmental effects

Moruroa and Fangataufa were severely affected by radioactive fallout, as were the surrounding islands. On the island of Mangareva, French military scientists found high radiation levels in fish, water, air and soil samples. Radioactivity above 650,000 Bq/kg was measured in unwashed salad grown on the island.² Depending on the prevailing radioisotopes, an adult would incur internal irradiation of about 40–70 mSv by eating one kg of salad, more than 100–200 times the amount of radiation that a human is exposed to from a normal diet (approximately 0.3 mSv/a). The radiation dose incurred from the same amount of salad would be twice as high for children.

Between 1966 and 1975, increased radioactivity was recorded at all monitoring stations in New Zealand, Fiji, Samoa, Tonga and Tahiti and as far east as Peru and Mexico.¹ After the detonation of a 120 kiloton bomb on Moruroa in September 1966, radioactive fallout covered the island of Samoa, increasing background radioactivity by a factor of 1,850, from 0.2 GBq/km² to 370 GBq/km². Radioactive fallout also reached Tahiti in 1974.¹ However, due to military restrictions, hardly any health data was collected or published. Only four very small-scale scientific investigations were permitted in recent years. These found high levels of tritium, iodine-131 and cesium-134 in sediment and water

samples and even higher amounts in plankton, providing evidence for enrichment of radionuclides in the marine food chain.¹

While heavy isotopes like uranium or plutonium were found very close to the detonation sites, light radionuclides like tritium, cesium-137 and strontium-90 were transported by currents out to the open sea. A study by the International Atomic Energy Agency (IAEA) found plutonium in the sediment of both lagoons with a total activity of about 30,000 GBq (Giga = billion), or the equivalent of about 15 kg of this highly toxic heavy metal.³ A dose of several milligrams of plutonium is lethal for humans, just one microgram can cause kidney damage as well as lung- and liver cancer. An observed decline in radionuclide concentrations could mean that it is being dispersed in the ocean through underwater crevices. Approximately 20 GBq of plutonium (about 10 g), is washed into the sea every year. A side-effect of the military activity on the atolls is also a massive increase in Ciguatera, a type of fish poisoning.¹

Outlook

Nuclear tests at Moruroa and Fangataufa ceased in 1996 due to international protest, but the atolls still remain restricted military territory. 30 years after the tests, about half of the radioactive strontium-90 and cesium-137 and all of the plutonium still remains in the archipelago's air, water and soil. There is concern that underwater cracks discovered in the atoll may allow more radiation to escape, as unknown amounts of radioactive material still remain in the underground test shafts.³

In 1998, the French defense minister admitted that the population of the islands of Tureia, Reao, Pukarua, Mangareva and Tahiti were affected by radioactive fallout from the nuclear tests.² Affected indigenous workers or their widows are suing for compensation, but 200 cases still remain before the courts and nothing is happening, while French workers have already received compensation. Meaningful scientific research is still scarce. Only a fully independent study with unrestricted access to currently classified information and the opportunity to sample and monitor atmospheric, oceanic and terrestrial data on Moruroa and Fangataufa can hope to assess the real consequences of nuclear testing for the environment and the health of their people. These people are also Hibakusha – they are also the survivors of nuclear bombs.

References

- ¹ “Radioactive Heaven and Earth: The Health and Environmental Effects of Nuclear Weapons Testing In, On, and Above the Earth.” IPPNW, 1991, chapter 9.
- ² Barrillot B. “Les retombées sur Mangareva.” Damocles la lettre No 112-114, April 2005. www.moruroa.org/medias/pdf/Damocles%20112-114.pdf
- ³ Povinec et al. “Marine radioactivity assessment of Moruroa and Fangataufa atolls.” Sci Total Environ. 1999 Sep 30;237-238:249-67. www.ncbi.nlm.nih.gov/pubmed/10568280

