

Non-radioactive but nuclear? Containment and circulation of wastes from the French nuclear tests in Polynesia

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Abstract. Beside Moruroa and Fangataufa, the two atolls where atomic bombs were detonated, the conduction of the French nuclear tests from 1966 to 1995 in Polynesia required the deployment of infrastructure throughout the whole archipelago. Their gradual decommissioning until the early 2010s produced massive volumes of wastes scattered through different islands. While being mainly non-radioactive but chemically polluted, the management and circulation of these materials, mainly consisting of gravels and soils, is currently stopped due to their perceived “nuclearity” (Hecht, 2012). Building on a case study developed in the atoll of Hao, which hosted the nuclear tests’ support base, this paper offers to document how these non-radioactive materials are defined as nuclear, thus confining their circulation. Results show that these wastes’ “nuclearity” results from their integration on multi-level conflicts.

1 Introduction

Following Fukushima’s accident, the spatial dynamics of nuclear power have attracted geographers’ interests back, leading to current structuration efforts of a “nuclear geography”. [1] Promoted since its early days as an a-territorial *dispositif* offering to societies the opportunity to throw off the shackles of geographical constraints [2], nuclear technologies never stopped producing territories though. Past research has extensively investigated the production of zones by nuclear industries, postulating that the atomic complex could not exist without constantly creating borders to prevent unauthorized incursions and to contain the dissemination of radioactive elements, both on normal operation conditions [3] or following accidents. [4] Nuclear technologies are thus fundamentally interpreted as matters of containment.

While these works have extensively researched the production of limits to manage nuclear sites, this approach has been less applied to the constant flow of matters that sustain the atomic complex. Yet, nuclear sites are “social metabolism” [5], produced through socially mediated streams of energy, materials, wastes, information, and humans that are simultaneously absorbed and rejected and without which the nuclear socio-system could not operate. Matters flowing into or away from nuclear sites are spatially constrained by categorization process which aims at segregating them through the evaluation of their sensibility regarding health and environmental safety or proliferation. These categorizations inform bodies of norms, administrative dispositions and legal texts that regulate their social

lives and their socio-spatial arrangement by determining how they should be handled, who's authorized to handle them, through which canals they can move and where they can go. [6] Nuclear geography is thus intrinsically made of networks of matters, producing reticular territories whose topology depends on multiple layers of containment measures informed by "geo-legal dispositive". [7]

Circulation of matters within the atomic complex, and their transgression outside of its borders, depend on the categorization of their "nuclearity". [8] Gabrielle Hecht's concept of "nuclearity" refers to the action of labelling a material, a technology, or an action as part of the nuclear realm, thus constraining its social life, and drawing its containment. [9] Hecht's works on the commerce of uranium in Africa showed that nuclear ontologies were neither fixed in time and space, nor transparently empirical. Consistent with social metabolism theories, Hecht showed that categorizing matters as nuclear is a mediated process which is not only informed by metrological data but appears as a "technopolitical category [whose] parameters depend on history and geography, science and technology, bodies and politics". [10] Way more than the measure of its actual radioactivity, the nuclearity of things is produced through constant negotiations and confrontations between actors, depending on their particular interests and social representation.

Research dealing with the atomic complex have been shaped by "nuclear exceptionalism" mainly considering radically nuclear matters and particularly high-level radioactive wastes, plutonium or enriched uranium. However, the acceleration of nuclear decommissioning through the world and the current upscaling of nuclear medicine is increasing the volume of low-level radioactive matters streaming, thus increasing the need to understand the mechanism permitting their circulation or imposing their confinement. To do so, this paper offer to focus on one case of such frontier-object by looking at the wastes produced by the infrastructure set-up on Hao Island for the French nuclear tests in the Pacific.

From 1966 to 1996, France conducted 193 nuclear tests in the Polynesian atolls of Moruroa and Fangataufa, 15,000 kilometres from Paris. Considering the two islands' distance from Tahiti, French Polynesia's main settlement, the army decided to build a support base in the atoll of Hao, equidistant between the tests site and the capital city Papeete. Hao hosted a military airport, caserns for over 1,200 men, industrial warehouses, decontamination facilities for boats and planes exposed to radiation, facilities for assembling the nuclear bombs and laboratories treating the radioactive samples collected after the blasts before being shipped to Paris. Following the decision to favour subterranean tests over atmospheric blasts in 1974, the last tests in 1996 and the closure of the military base in 2000, Hao went through multiple deconstructions, producing vast amounts of wastes and matters. In this paper, we propose to focus on the management of two types of wastes (gravels and polluted soils) produced by the decommissioning of these infrastructures. Here we offer to explore the ontology of what Becky Alexis-Martin coined as "para-nuclear wastes, [...] incidental by-products of the nuclear military industrial complex". [11]

Drawing from a Political-Industrial Ecology framework, we'll seek to qualify how the "resource flows and stocks are shaped by environmental, socio-economic and political processes and patterns over time and space". [12] This research is built on a desk study of grey literature, the systematic analysis of Polynesian newspapers' databases (*La Dépêche de Tahiti*, *Les Nouvelles de Tahiti*, *Tahiti Pacifique*) and 17 semi-structured interviews conducted in April 2019. Results show that, even if these matters are not radioactive anymore, their symbolic nuclearity constrained their circulation and forced measures of containment.

2 Circulating the matters: a sensible stake for Hao's reconversion

The successive deconstruction of Hao's military infrastructures led to different types of waste management practices. During the operations, wastes produced by punctual decommissioning works were either scavenged by the atolls' inhabitants, dumped into the ocean, or buried in the island. Following the end of atmospheric tests in 1974, the decontamination facilities and the nuclear laboratories situated on the south of the atoll started a long dismantling process achieved twenty-five years later. After the base closure in 2000, the army decided to leave its infrastructures on site and to make them available to local landowners. However, due to lack of financial capacities and to land conflicts between heirs, these facilities were abandoned and fell into ruin. From 1966 to the early 2000s, with the exception of few valuable metals that were sold and shipped to Asia, the para-nuclear wastes produced by the French nuclear tests' infrastructure were contained within Hao, whether submerged, buried, left in place, stocked in landfills or reused when possible.

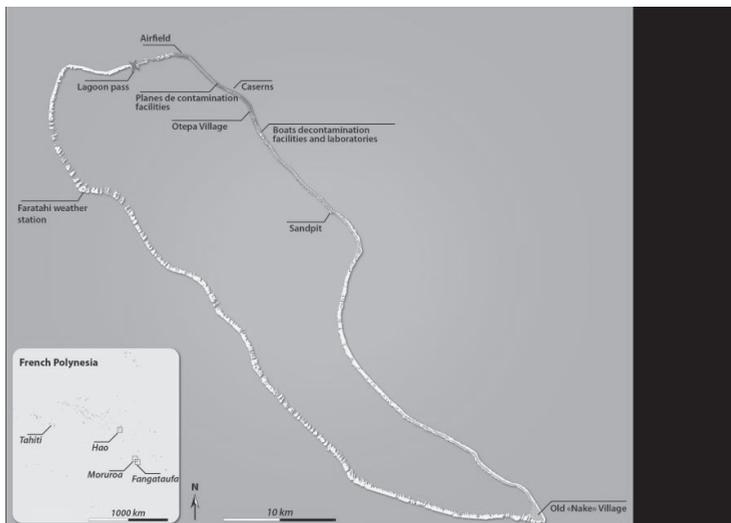


Fig. 1: Map of Hao atoll and location within French Polynesia. Source: the author.

Facing Hao's growing poverty after the military base closure, the French and the Polynesian government started in 2008 a reconversion project aiming at strengthening the local economy through the enhancement of trans-Pacific tourism, copra and vanilla production and administrative functions. Attracted by its central location in the Pacific region and by the presence of transportation facilities, Chinese investors developed a large-scale fish farm project in the atoll fully dedicated to the Chinese market. Initiated in 2012, this facility is not yet constructed. However, the multiplication of new economic proposals in Hao increased the need for usable space and the will to getting rid of the past traces of the military-industrial complex. Rehabilitation works were thus engaged in 2009 to restore the fields still hosting ruins or wastes of the nuclear-test eras, to depollute soils and to evacuate these matters from the islands. While the unemployment rate topped above 50% in Hao, the circulation of these para-nuclear wastes appeared as essential.

3 Containing Hao's "stained gravels": the conflict in Rikitea

The dismantling of Hao's military base and the deconstruction of over 61 buildings generated voluminous amounts of valueless heavy products, estimated around 70,000 m³ of concrete and 12,000 m³ of bituminous materials. Despite being freely given to the local population, the amount of gravels quickly overwhelmed the municipality's needs, thus forcing the local council to search for potential outlets for these bulk products.

In 2016, in order to lower the cost of repairing the island's ring road, the mayor of Rikitea (Gambier archipelago), about 800 km from Hao, bought some of these rubbles, for a price five times lower than that of Tahiti. Despite their small volume - 122 m³ -, the gravels' dischargement at Rikitea Harbor on 22 October 2016 triggered the opposition of the local representatives of the association "193", which militates for the recognition of the consequences of the nuclear tests in Polynesia. The organization of demonstrations in Rikitea and in Papeete, as well as the blockade of the gravels organized by the militants for three weeks on the port, forced the president of French Polynesia, Edouard Fritch, to organize a televised intervention in November 2016.

The "193" association grounded its opposition in the denunciation of a so-called "radioactive taint" contaminating the gravels. While the French Radioprotection and Nuclear Safety Institute (IRSN) measured the wastes and found no trace of abnormal levels of radioactivity, "193" rejected these results, considering that the Institute was part of the "French state, which has always claimed that the nuclear tests were clean". [13] Despite new tests conducted by an independent laboratory that led the association to recognize the harmlessness of the gravels, "193" maintained its opposition to their circulation out of Hao, invoking the symbolic charge that these materials were carrying. The gravels were ultimately sold by Rikitea Municipality to private entrepreneurs on the islands and all further shipments were abandoned, thus continuing their containment in Hao.

If these controversies reflected "193"'s place as the most virulent actor among the associations fighting for the recognition of the nuclear tests' consequences, they were also a by-product of the particular political context at that time. On the one hand, while "193" political stance is historically close to the left-wing independentist movements, Edouard Fritsch party is situated on the right-wing and is favourable to the maintenance of Polynesia within France. On the other hand, at that time, "Moruroa e Tatou" the leading association of the struggle for the recognition of the nuclear tests' victims in Polynesia was losing its momentum, thus leaving space for "193" which saw a strategic opportunity in politicizing the gravel question.

4 Handling Hao's polluted soil: a struggle between scales

The development of the Chinese fish farm project in Hao led to the depollution of around 185 hectares of land in the atoll, whose property was then transferred to the municipality and the government of French Polynesia. Situated close to the airfield, these lands were formerly hosting industrial warehouses, technical facilities, power plants and fuel tanks, leaking chemical products for almost half a century. If the environmental diagnostic showed that more than 96,8% of the lands were free of any pollutant, 5,9 hectares, representing around 136,000 m³ of soils presented large chemical contamination. Thanks to the implementation of a newly developed technic, hydrocarbons and PCBs were sorted out and isolated. However, more than 75,000 m³ of soils contaminated with heavy metals are still waiting for a management solution in Hao.

These wastes' containment on the atoll is suspended on political negotiations between national, regional, and local authorities. On the one side, the French state request them to be stored on the island, a solution refused by the municipality and the Polynesian government, seeing it as a danger for Hao's economic future. On the other side, local authorities favor the exportation of these wastes out of the islands. Facing the high cost of shipping these soils to

countries capable of recycling them – estimated at 31 million euros for Norway, for example – the municipality is asking for them to be transferred to the nuclear testing ground of Moruroa. Even if no traces of artificial radioactivity could be found in the soils, these matters were still seen as byproducts of the tests. This solution was rejected by the army, which considers the atoll to be free of pollution. In May 2020, these wastes were still contained in Hao.

5 Conclusion: “Nuclear but not radioactive” matters of containment

Neither the gravels, nor the soils currently stored in Hao and produced by the decommissioning of the atoll’s military base present any traces of artificial radioactivity derived from the tests that were conducted in Polynesia. However, both materials are still confined in the island and prevented from circulating because they are still perceived as nuclear and defined as such by actors.

The nuclearity of these para-nuclear wastes is not defined by their actual radioactivity, or even by potential past contamination, but because they keep the mark of the particular history of the place where they were produced. However, their social categorization as nuclear and the containment practices imposed by such categorization is contingent. They are the produce of a particular set of actions and system of actors which could recombine themselves through time, thus potentially allowing their future circulation. Their nuclearity is the outcome of controversies which sometimes have little to do with the nuclear past they are related to. Hao’s wastes are nuclear but not radioactive and so is their current containment in space.

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