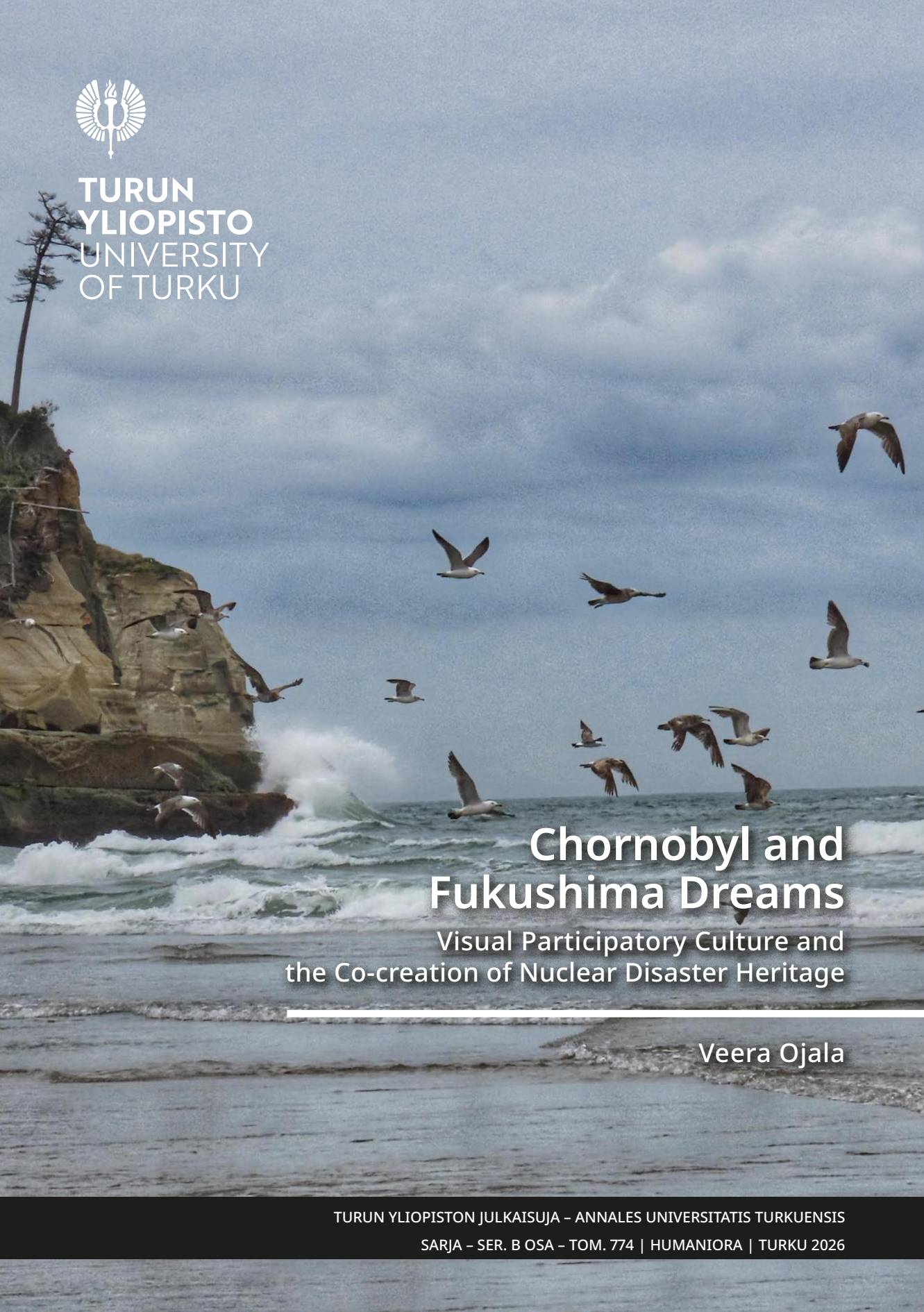

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UNIVERSITY OF TURKU

Chornobyl and Fukushima Dreams

Visual Participatory Culture and the Co-creation of Nuclear Disaster Heritage

Veera Ojala

TURUN YLIOPISTON JULKAISUJA – ANNALES UNIVERSITATIS TURKUENSIS
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ABSTRACT

This research explores the relationship between visual participatory culture and nuclear cultural heritage. Nuclear cultural heritage is a recent addition to heritage studies and practice. It encompasses a wide range of tangible and intangible assets, including decommissioned power plants, museum exhibits, landscapes, and communities associated with the civil and military nuclear industries.

The twentieth century's defining anxieties and aspirations find expression in nuclear cultural heritage, which captures both the promise of atomic energy as an inexhaustible technological breakthrough and the fear of global annihilation. Nowhere is this tension more tangible than in disaster-scarred landscapes such as the Chornobyl Exclusion Zone (CEZ) and the Fukushima triple disaster area, the primary focus of this dissertation. Like other forms of cultural heritage, it remains inseparable from the wider arc of industrial history and the evolving relationship between societies, nature, and technology.

This dissertation explores how members of contemporary digital participatory cultures interpret and represent the nuclear past, drawing on quotidian, non-expert perspectives rather than official or institutional narratives. Its contribution to this emerging research area lies in examining how vernacular visual culture shapes the meaning of nuclear heritage sites, an approach that can be understood as heritage-from-below. Relatively little is known about the broader significance of the CEZ and the Fukushima triple disaster area as seen through such grassroots visual lenses. For visitors to these sites, memory-making tends to follow a bottom-up logic, with photography serving as a medium that captures dimensions of experience that resist verbal expression. This dissertation conceptualises these practices of shared visual storytelling and imaginative engagement with nuclear spaces as nuclear visual culture, a discursive space in which images and words together shape how these landscapes are understood and remembered.

This research employs a mixed-method approach to highlight the interconnectedness and multi-layered nature of this specific socio-cultural phenomenon. Meaning-making is co-created through the interplay of offline and online realities, where photography acts as an interpretative medium, shaping the significance attributed to heritage resources. Alongside ethnographical and netnographical investigations, complemented by qualitative interviews, the study

utilises comprehensive visual methods such as participant-generated images (PGI) and photo-elicitation.

The dissertation consists of four articles, through whose interview and photographic analyses the research examines how visitors' experiences at nuclear disaster sites translate into visual narratives and how these visual representations participate in the co-production of cultural memory. The articles make the following contributions to the definition and research of nuclear cultural heritage: (1) The concept of nuclear visual culture provides an essential empirical anchor for the study of nuclear cultural heritage, as it enables the production of nuanced contextual knowledge from the perspective of visitors. (2) Nuclear cultural heritage should be understood primarily as a socio-cultural practice rather than a static inventory of sites, since communities' participatory visual culture demonstrates that heritage is constructed through continuous interpretive interaction. (3) Photography is not passive documentation but an active instrument that participates in the formation of heritage resources and the construction of value interpretations. (4) Participatory visual culture is a grassroots activity that challenges top-down heritage management, transforming the way in which heritage is perceived, interpreted, and experienced. The research sheds further light on the role of the broader public in the interpretive processes of nuclear cultural heritage and on its position as a co-creator of digital nuclear memory and experience.

KEYWORDS: nuclear cultural heritage, nuclear visual culture, critical heritage, co-creation, participatory culture, participant-generated images (PGI), photography, mixed-methods research, Chornobyl, Fukushima

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VEERA OJALA: Tšernobylin ja Fukushiman kuvastot: visuaalinen osallistujakulttuuri ja ydinkatastrofiperinnön yhteisluominen
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Historian, kulttuurin ja taiteiden tutkimuksen tohtoriohjelma (Juno)
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TIIVISTELMÄ

Tämä tutkimus tarkastelee visuaalisen osallistujakulttuurin ja ydinvoiman kulttuuriperinnön välistä suhdetta. Ydinvoiman kulttuuriperintö on tuore lisä kulttuuriperintötutkimuksen kenttään, kattaen laajan kirjon aineellisia ja aineettomia resursseja, kuten käytöstä poistettuja ydinvoimaloita, museoita, maisemia sekä siviili- ja sotilasteollisuuteen liittyviä yhteisöjä.

Ydinvoiman kulttuuriperinnössä tiivistyvät teknologian keskeisimmät pelot ja toiveet, jotka kietovat yhteen sekä lupauksen atomienergian ehtymättömästä teknologisesta läpimurrosta, että uhkakuvat maailmanlaajuisesta tuhosta. Tämä jännite on konkreettisimmillaan katastrofien runtelemissa maisemissa, kuten Tšernobylin suojavyöhykkeellä ja Fukushiman kolmoiskatastrofin alueella, jotka ovat tämän väitöskirjan keskiössä. Kuten muutkin kulttuuriperinnön muodot, ydinvoiman kulttuuriperintö on erottamaton osa laajempaa teollistumisen kehityskulkua sekä yhteiskuntien, ekosysteemien ja teknologian jatkuvasti muuttuvia suhteita.

Tämä väitöskirja tutkii, kuinka digitaalisen osallistujakulttuurin jäsenet tulkitsevat ja esittävät ydinkatastrofeja, nojautuen arkisiin, ei-asiantuntijanäkökulmiin virallisten tai institutionaalisten kertomusten sijaan. Tutkimuksen kontribuutio tälle kehittyvälle tutkimusalueelle on vernakulaarisen visuaalisen kulttuurin merkityksenannon kontekstualisointi, lähestymistapa, jota voidaan kutsua alhaalta ylös rakentuvaksi perinnöksi. Väitöskirja käsitteellistää visuaalisen tarinankerronnan ja radioaktiivisesti saastuneiden alueiden mielikuvallisen yhteistuottamisen käytännöt ydinvoiman visuaaliseksi kulttuuriksi, diskursiiviseksi tilaksi, jossa kuvat ja sanat yhdessä muovaavat tapaa, jolla nämä maisemat ymmärretään ja muistetaan.

Tutkimus hyödyntää monimenetelmällistä lähestymistapaa korostaakseen tämän sosiokulttuurisen ilmiön monikerroksisuutta. Merkityksenanto rakentuu reaali- ja virtuaalitodellisuuksien vuorovaikutuksessa, jossa valokuvaus toimii tulkinnallisena välineenä, muovaten perintöresursseille annettuja merkityksiä. Etnografisten ja netnografisten tutkimusten sekä laadullisten haastattelujen rinnalla tutkimus hyödyntää visuaalisia menetelmiä, kuten osallistujien tuottamia kuvia ja valokuvaelisitaatiota.

Väitöskirja koostuu neljästä osa-artikkelista, joiden haastattelu- ja valokuva-analyysien kautta tutkimus tarkastelee, kuinka vierailijoiden kokemukset ydinkatastrofialueilla kääntyvät visuaaliseksi kerronnaksi ja kuinka nämä visuaaliset representaatiot osallistuvat kulttuurisen muistin yhteistuottamiseen. Väitöskirjan

osa-artikkelit muodostavat seuraavat tulokset ydinvoiman kulttuuriperinnön määrittelyyn ja tutkimukseen: (1) Ydinvoiman visuaalisen kulttuurin käsite tarjoaa välttämättömän empiirisen ankkurin ydinvoiman kulttuuriperinnön tutkimukselle, sillä se mahdollistaa vivahteisen kontekstuaalisen tiedon tuottamisen vierailijoiden näkökulmasta. (2) Ydinvoiman kulttuuriperintö on ymmärrettävä ensisijaisesti sosiokulttuurisena toimintana eikä staattisena kohdeluettelona, koska yhteisöjen osallistuva visuaalinen kulttuuri osoittaa perinnön rakentuvan jatkuvassa tulkinnallisessa vuorovaikutuksessa. (3) Valokuvaaminen ei ole passiivista dokumentointia vaan aktiivinen väline, joka osallistuu perintöresurssien muotoutumiseen ja arvotulkintojen rakentumiseen. (4) Visuaalinen osallistujakulttuuri on ruohonjuuritason toimintaa, joka haastaa ylhäältä alas tapahtuvan perinnönhallinnan, muuttaen tapaa, jolla perintöä havaitaan, tulkitaan ja koetaan. Tutkimus tuo lisävaloa laajan yleisön roolista ydinvoiman kulttuuriperinnön tulkintaprosesseissa sekä sen asemasta digitaalisen, ydinvoimaan liittyvän muistin ja kokemusten yhteistuottajana.

ASIASANAT: ydinvoiman kulttuuriperintö, ydinvoiman visuaalinen kulttuuri, kriittinen perintö, yhteistuotanto, osallistujakulttuuri, osallistujien tuottamat valokuvat, valokuva, monimenetelmäisyys, Tšernobyl, Fukushima

Acknowledgements

I was traveling in Ukraine in 2018, and while in Kyiv, I was also searching for a topic for my Master's thesis research, as I was about to begin the process. The visual presence of the Chornobyl Exclusion Zone (CEZ), especially on social media, caught my attention because the images seemed to be communicating in their own way. Later, I conducted my Master's thesis on the visual meaning-making among visitors to the Zone, and that same curiosity motivated me to pursue this PhD dissertation.

When I began my PhD, the concept of "nuclear cultural heritage" emerged as an interdisciplinary research focus. My work on digital participatory culture and documentation of nuclear accident sites through photography aligned closely with this developing field. Over the years, I have had the opportunity to contribute to this emerging research area and have visited numerous nuclear-related facilities in Lithuania, Germany, Ukraine, and Japan, all of which address significant and timely issues related to the nuclear past and its significance for the present.

Since I began these academic pursuits in 2019, many things have changed, and many things persist. The COVID pandemic limited how people moved around, and then the full-scale invasion by Russia altered the status of the CEZ as a tourist destination. During my time in Kyiv in 2019 for fieldwork, I met many local stakeholders, spent time with them, and learned about the significance of the Zone from their perspectives. After the invasion, many of them joined the military, and some lost their lives defending their country. The war continues for the fourth year while I am finishing this dissertation, and its possible outcomes are still difficult to comprehend.

I have been fortunate to connect with an interdisciplinary and international research network and scholarly communities in Finland, Germany, Ukraine, and Japan. These opportunities to engage with a diverse range of researchers and local stakeholders have enriched and deepened my understanding of the sites of my research, the CEZ and Fukushima, as part of a living memory.

The outcomes of my curiosity about the medium of photography and its interpretational and translational potentials of nuclear landscapes are summarised in four research articles in this dissertation. However, I still feel those works only scratch the surface, and I am positive that the mediation of memory and landscapes through digital photography will continue to evoke interest in future research.

The opportunity to conduct this research, to be challenged, and to develop myself along the way are true assets, yet learning is a paradox; the more I learn, the less I know. Education and development are lifelong journeys, and I aim to cherish an attitude of incompleteness, curiosity, and a willingness to learn something new.

I wish to express my deepest gratitude to the scholarship networks that have supported this research. My supervisors, Anna, Tiina, and Marko, have shaped both the quality and direction of this work in ways that go beyond academic guidance; their mentorship and the enriching opportunities their scholarships made possible have been deeply meaningful to me. To my family and friends, near and far: I am fortunate to belong to such a rich and diverse network, whose knowledge and steady support have carried me through the years. I would like to thank the research participants for their contributions to the images, which have been a rich source for research and pedagogical purposes.

The Turku University Foundation's residency visits at Villa Tammekann have offered a peaceful and generative writing environment throughout this process. The grants from the Finnish Cultural Foundation and the Satakunta Regional Fund, together with my salaried position at the University of Turku, have enabled me to pursue this research with focus and continuity, and to participate on an international stage in the timely emergence of a novel field of inquiry

Your sincerely, Veera
Turku, Finland, May 3rd 2026

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List of Original Publications

This dissertation is based on the following original publications, which are referred to in the text by their Roman numerals:

I Ojala, Veera. Chernobyl Dreams: Investigating Visitors' Storytelling in the Chernobyl Exclusion Zone. *International Journal of Tourism Cities*. 2022; 10(1): 53-65. https://doi.org/10.1108/IJTC-04-2022-0094

II Ojala, Veera. Co-constructing Chernobyl: Investigating Visitors' Heritage Meaning-Making Through Performativity in the Chernobyl Exclusion Zone. *Connecting with Ambivalent Heritage: Creative Uses of Postindustrial Spaces.* 2024; UCL Critical Cultural Heritage Series: 109-132. https://doi.org/10.5040/9781350426771.ch-005

III Ojala, Veera. Chornobyl Visual Lexicon: Exploring the Visual Framing of Toxic Heritage from the Point of View of Participatory Culture. *Visual Studies*, 2024; 41(1): 35-48. https://doi.org/10.1080/1472586X.2024.2441262

IV Ojala, Veera. Chornobyl and Fukushima Visual Archives: Visitors' Practices of Curatorship of the Nuclear Accident Sites. *Heritage & Society*, forthcoming.

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1 Introduction: Rethinking the Role of an Atomic Tourist

Figure 1. A person gazes toward the Pacific Ocean in Sendai, at a site that was submerged by the March 2011 tsunami. Photograph taken in May 2025 by Veera Ojala.

> *"What do the images want from us? Where are they leading us? What is it that they lack, that they are inviting us to fill in? What desires have we projected onto them, and what forms do these desires take as they are projected back to us, making demands upon us, seducing us to feel and act in specific ways?"*
>
> W.J.T. Mitchell: What do Pictures Want?

What is a photograph, and what does it do in the context of nuclear cultural heritage and nuclear visual culture? This dissertation was prompted by my personal interest in understanding photography as a communicative act and as a potential for world-making (Larsen 2006) in the context of nuclear heritage, an often-overlooked yet

prevalent sphere of heritage. Through my studies as a PhD candidate in cultural heritage, I have personally found meaning-making to be one of the most significant and increasingly evolving ways of engaging with heritage resources and imbuing them with significance, an activity that photography facilitates. Photography translates into the practice of interpreting and preserving the past and present, but also into the activity of future-making to which communities contribute by shaping and bringing it into being (Holtorf and Högberg 2021, 18) through the medium's imaginative horizons.

Debates on nuclear cultural heritage underscore the ethical and practical challenges of preserving and interpreting sites, artefacts, and knowledge related to nuclear energy, weapons, and technology. Preservation efforts span historical, environmental, cultural, and scientific considerations, raising complex questions about the significance of this contested heritage (Dovydaitytė 2022a; 2022b; Rindzevičiūtė 2019; 2021). The interaction between communities, societies, and technology shapes our understanding of the industrial and nuclear past and its impact on and significance for civilisation. Nuclear cultural heritage is distinct because radioactive materials extend the timeframe of heritage to the distant future and require new management approaches (Ialenti 2020; Storm 2020). Additionally, the presence of toxicity blurs the boundaries between nature and culture, as well as between tangible and intangible resources (Wollentz et al. 2020). These characteristics have also inspired nuclear visual culture in its various forms to provoke cultural responses to living with nuclear technology. Post-nuclear discourses, whether expressed through artistic works, digital participatory photography, or popular culture, are co-created within a discursive realm that influences responses to risk and recovery, leading to visions of a world confronting its nuclear past, present, and future.

The advent of the nuclear age has gone hand-in-hand with camera technology developments and influenced visual culture, transforming nuclear objects from simple technological artefacts into powerful cultural symbols. This transformation is evident in various artistic and visual representations and categories of nuclear photography (Carpenter 2016; Decamous 2018; O' Brian 2015; Schuppli 2020; Volkmar 2022). Whereas there is an abundance of research conducted among the artistic practices around nuclear technology in its various manifestations (Decamous 2018; Geilhorn and Iwata-Weickgenannt 2018), the participatory domain is often overlooked, thus setting the parameters for the current discussion on nuclear visual culture unilaterally. Yet, as I argue in this dissertation, novel digital technologies have established a platform for public participation and co-creation in these socio-technological imaginaries, and it is such a vast and distinct system of collective imaginary creation, dissemination, and communication that it deserves scholarly attention. The digital platforms of public participation and visual representations

reflect society's complex relationship with nuclear technology, expressed as fears, desires, and hopes attached to its capabilities and material traces.

The first contribution of this dissertation is to conceptualise and analyse nuclear visual culture as a sub-category within nuclear cultural heritage and the attached activities of digital participatory culture, which provide a framework for analysing how these images and artefacts shape and reflect societal perceptions and responses to nuclear technology and post-nuclear imaginaries. By examining the production and dissemination of visual media, particularly photographs, I aim to contribute to increasing knowledge of how nuclear themes permeate public consciousness and influence cultural narratives through *the dynamics of visual elements and photographs as cultural agents*.

An inherent aspect of contemporary heritage-making activities are digital image practices, which in the context of this research include the activity of physically engaging with heritage sites, taking photographs and subsequently uploading, sharing, and contextualising these images on social media platforms (Bareither 2021). Along with the intertwining of online and offline realities, material spatial performances, and meaning-making, clear dichotomies of heritage ontologies are blurred; this multi-layeredness also helps to obscure the distinction between tangible and intangible heritage resources (Harrison 2012; 2018). Therefore*, the second focus of this dissertation* is to problematise the dichotomous distribution of heritage resources as tangible or intangible, and through digital photography to elaborate on the ambiguous role of digital images in this process as a medium that does not fit neatly into either category. Instead, digital images occupy a space between the two continuums, with the capacity to transform both, *as a form of emergent heritage, as a visual context, and as a catalyst of cultural heritage* (Article I; Article III; Article IV).

Photography works as a communicative act, and as it interprets, shapes, and forwards meanings, it also acts as a tool of world-making (Larsen 2006; Urry and Larsen, 2011; Sterling, 2020). It is therefore mandatory in the context of today's image-saturated heritage sites to understand the activities of signification and creation of meaning from the perspective of visual cultures as heritage-from-below (Smith 2021; 2006). This form of creative act and communication influences narrative constructions of heritage, shapes historical memory and identities, and reinforces societal frameworks in what becomes understood as (nuclear) cultural heritage (Waterton and Watson 2010). Therefore, I advocate for focusing on the medium of participatory photography as the subject of thorough analysis (Article I; Article III; Article IV), since only thus can we uncover the complexities and underlying dynamics of this medium and how it translates, sustains, and interacts with broader technological nuclear imaginaries and representational categories.

The locations examined in this dissertation are two nuclear disaster sites in geographically and culturally dispersed regions in Asia and Europe, namely Ukraine and Japan. Neither Fukushima nor Chornobyl has been officially recognised as heritage sites, but both have been subject to authorised and unauthorised memory practices (Article I; Article II; Article III; Article IV). Whereas many of the nuclear-related facilities are highly restricted and photography is prohibited, at nuclear accident sites in Chornobyl and Fukushima, photography is the primary engagement act with the material context, and this representational imbalance establishes an interesting contextual setting. As a result, these sites serve as opportunities to explore the nuances and tensions that arise when different heritage practitioners utilise these sites in order to interpret the nuclear past and consider the social repercussions and impacts of these performances and practices of remembrance (Smith 2021, 20).

The third contribution of this dissertation is an analysis of the visual representations by visitors to these sites as techno-social discourses and as a form of *broad public participation*, which attempts to respond to and organise the ongoing experiences of living with nuclear technology. This stance broadens the discursive sphere, where these activities gain meaning beyond the dark tourism conceptualisations, and as interpretations of the past, being acknowledged as future-oriented, enabling also imaginaries of hope (Klaubert 2024; Wollentz 2026). The vast repositories of visual content on various online platforms and the role of visitors to these sites must be acknowledged as attempts to negotiate risks, fears, and hopes related to the past, present, and futures of nuclear technology and to negotiate the conditions of life in altered environments (Article IV). Thus, these practices are understood as *acts of signification in a living culture and the dynamics of heritance-making.* Therefore, this dissertation research sheds light on heritage co-creation and photographs as "cultural texts of power, politics and space" (Geilhorn and Iwata-Weickgenannt 2018, 10), thereby contributing to research on the cultural dimensions and imaginaries of altered landscapes and forms of knowledge produced by these visual discourses.

To unravel these bottom-up processes of signification, a critical heritage approach is valuable, as it emphasises the plurality of heritage-making and acknowledges the agency of unauthorised practices in shaping meaning (Smith 2006; 2021). To identify these emergent and entangled practices of engaging with heritage resources, I have supplemented this research with the framework of semiotics and performative co-creation (Crouch 2010; Harrison 20212; Kress and van Leeuwen 2021; Rose 2023; Smith 2006; Waterton and Watson 2010), as those enable the examination of connections between subjective experience and semiotic anchors, while recognising their dynamic interrelations (Hilmar 2015, 458), and *the knowledge co-created through these interactions*. Heritage values are ever-evolving, particularly in light of the recognition of the significance of nuclear cultural heritage

for individuals, communities, and societies. Therefore, analysing the visual strategies employed in photography and participatory culture offers a framework for examining the interactions and transformation of nuclear image environments and the purposes they serve.

In the course of the four research articles that make up this dissertation, I investigate the tension within heritage processes and practices, spanning the spectrum from formal, authoritative heritage to informal, participatory-driven uses, unpacking the vernacular co-creation of space and how these sites and their meanings are contested, shaped, and negotiated. These dynamical material-discursive interactions generate constantly evolving textures on the heritage sites, through which the past is interpreted and forms of knowledge produced (Article I; Article II; Article III; Article IV). Through the work of the four original research articles, I am providing novel insights into the nuclear heritage in making, through the lens of *nuclear visual culture* as a co-creative act that has the capacity to transform cultural understanding of what constitutes nuclear cultural heritage.

Before moving to the next section, a note on language politics is warranted. As early as 2019, when I began my fieldwork, Ukrainian speakers were already favouring the Ukrainian transliteration "Chornobyl." Since the full-scale invasion, this form has gained broad recognition as the preferred shared term, displacing the Russian-based "Chernobyl." The journals in which Articles 1 and 2 were published used the Russian transliteration; academic journals have since come to accept the Ukrainian form as well. Throughout this dissertation, I use "Chornobyl," except in those two Articles (I and II) and their titles, which were published in 2022 and 2024. Where interviewees used "Chernobyl," I have retained their original expression. I use "CEZ" or "the Zone" when referring to the Chornobyl Exclusion Zone. Three (I, II, III) of the four Articles focus on the CEZ, while the fourth (IV) compares Chornobyl and Fukushima. The comparative move highlights the distributed, contested, and participatory nature of nuclear memory cultures, and Fukushima was added to this dissertation as the final article, as it valorises the complexity of the altered landscapes and broadens the parameters of discussion.

1.1 Questions and Objectives

The research aims to explore the transition from viewing nuclear infrastructure primarily for its energy and security utility to recognising its symbolic significance within nuclear visual culture. It also examines the specific role of photography in shaping nuclear heritage and public memory through the examination of how nuclear power-related sites convey meaning in visual culture, particularly through photography. I focus on the visual culture of the CEZ and the Fukushima triple disaster area, emphasising participant-oriented perspectives. By utilising a

participant-oriented approach, this dissertation elaborates on the social and cultural practices in the commemoration of contaminated areas and how these photographic engagements are turned into forms of knowledge as material-discursive legacies. To find an answer to these aims, I pose one central question and four supporting research questions:

How do participatory practices of nuclear visual culture contribute to the co-creation of nuclear cultural heritage?

Four sub-questions align with the themes of each article.

I) In what ways do different visitor groups perform Chornobyl's heritage through narrative and visual representation?

II) How do visitors' spatial strategies perform and communicate the inherited significance of the Chornobyl Exclusion Zone?

III) What visual distinctions can be observed in visitors' photographs of the Chornobyl nuclear disaster Zone from 2008, 2013, and 2018, and how have these representations temporally evolved?

IV) In what ways do the visual narratives of the Chornobyl and Fukushima disaster sites diverge concerning post-nuclear imaginaries?

To find answers to these goals, this dissertation advocates for slow disaster thinking by using the history of disaster memory to consider the nuclear not only as a collection of material realities but also as a complex assemblage of ideas, cultural practices, warnings, hopes, and nightmares (Horn 2018; Kirby 2019; Knowles 2022). Nuclear memory, as expressed through possibilities for expression and imaginative horizons at the sites of this research, addresses an impoverished historical record filled with erasures and also opens the door for new critical approaches to disaster governance (Knowles 2022), encouraging us to reflect on the broader cultural meanings these sites embody. The public contributes to the ongoing co-creation of meaning by performing the significance of these sites through spatial practices, interpreting the landscape through experiences and semiotic marks, within the material-discourse domain that organises and frames the techno-social imaginaries at these locations. These shifting horizons of imagination are essentially practices of organising the relationship between societies, cultures, and technology. Table 1 presents the four research articles.

Table 1. The table presents the four research articles, keywords, corresponding research questions, data collected, methods, and publication platforms.

Article	Keywords	Research Question	Data	Methods	Publication Platform
Article I: Chernobyl Dreams: Investigating Visitors' Storytelling in the Chernobyl Exclusion Zone	Dark tourism, visual studies, PGI, storyscape, storytelling, narrative	In what ways do different visitor groups perform Chornobyl's heritage through narrative and visual representation?	Interviews n=40 PGI n=120	Ethnography qualitative interviews participant-generated images photo-elicitation	International Journal of Tourism Cities (Published 12/2022) Academic journal
Article II: Co-Constructing Chernobyl: Investigating Visitors' Heritage Meaning-Making through Performativity in the Chernobyl Exclusion Zone	Ambivalent heritage, toxic heritage, tourismscape performativity, contestation	How do visitors' spatial strategies perform and communicate the inherited significance of the Chornobyl Exclusion Zone?	Interviews n=40	Ethnography, qualitative interviews, narrative analysis	Connecting with Ambivalent Heritage Bloomsbury Publishing Plc. Tiina Äikäs & Tuuli Matila (eds.) (Published 09/204) Article in an academic book
Article III: Chornobyl Visual Lexicon: Exploring the Visual Framing of Toxic Heritage	Visual studies, toxic heritage, heritage framing, participatory culture, content analysis, social semiotics	What visual distinctions can be observed in visitors' photographs of the Chornobyl nuclear disaster Zone from 2008, 2013, and 2018, and how have these representations temporally evolved?	Interviews n=18 Content analysis n=600 PGI n=72	Netnography, content analysis qualitative interviews participant-generated images (PGI) social semiotics	Visual Studies (Published 12/2024) Academic journal
Article IV: Chornobyl and Fukushima Visual Archives: Visitors' Practices of Curatorship of the Nuclear Accident Sites	Visual culture, Chornobyl, Fukushima, nuclear heritage, participatory culture, imaginary, photography	In what ways do the visual narratives of the Chornobyl and Fukushima disaster sites diverge concerning post-nuclear imaginaries?	Interviews n=17 PGI n=75	Ethnography, netnography semiotics qualitative interviews participant-generated images (PGI)	Heritage & Society (Submitted after revisions 04/2026) Academic journal

1.2 Key Concepts

Figure 2. Unfinished cooling tower in the CEZ. Photograph taken in October 2019 by Veera Ojala.

In this dissertation, I primarily utilise two different conceptualisations of heritage, *critical* and *nuclear cultural heritage*, to explore their interfaces and conceptual possibilities when investigating the meaning-making of visual culture on radioactively contaminated sites. I argue in favour of the importance of these conceptualisations, as they enable the investigation of heritage as an activity of meaning-making for the needs of present heritage communities, acknowledging the participatory, non-professional heritage engagements (Smith 2006; 2015). These heritage concepts create a clear, elaborative space for analysing emergent visual expressions through practices of participatory culture and the participants' co-creation of heritage sites through their digital image practices. In this section, I will briefly outline the key concepts of this dissertation research to establish a conceptual framework for the study and to facilitate the reader's understanding of the subsequent argumentation.

1.2.1 Critical Heritage

Critical heritage studies (CHS) is an interdisciplinary field that interrogates the processes, politics, and practices of heritage creation, preservation, and

interpretation. CHS, as a conceptual framework, rethinks heritage as a social, political, and cultural process rather than a static legacy from the past (Harrison 2018; Smith 2022). Moving beyond traditional notions of heritage as a celebratory record of the past, critical heritage studies examine how power dynamics, cultural narratives, and societal values shape what is remembered, forgotten, or contested as heritage (Kryder-Reid 2018; Smith 2006).

This approach challenges essentialist and exclusionary definitions of heritage, embracing a more pluralistic and dynamic understanding of cultural memory and identity (Harrison 2012). In addition, the CHS approach advocates inclusive, participatory, and reflexive practices that consider multiple voices and contested histories (Winter 2012). Since this dissertation research employs a mixed-methods approach in a setting of contested and non-authoritative heritage, the critical heritage approach offers particular benefits because it challenges traditional views of heritage as fixed, universal, or neutral. Instead, it highlights the dynamic, contested, and socially constructed nature of heritage, emphasising how it is influenced by identity, memory, and communication media.

1.2.2 Nuclear Cultural Heritage

Nuclear cultural heritage (NCH) includes both physical and intangible legacies of nuclear technology, such as power plants, waste sites, uranium mining locations, landscapes changed by nuclear activities, and communities affected by them. NCH is a broad concept because it incorporates cultural and industrial values (Rindzevičiūtė 2019) and covers anything that has interacted with nuclear technology and science. The framework of NCH reflects the broad and interdisciplinary nature of the field, relating to both civilian and military uses of nuclear technology, such as reactors, weapons, waste, and infrastructure, as well as sites, along with the diverse narratives, values, and imaginaries associated with them (Decamous 2018; Mbah et al. 2025). Practices of nuclear heritage are varied and include collecting, storing, archiving, and caring for key artifacts of nuclear material culture; mapping and protecting sites, preparing and securing documentation, recording intangible practices, and creating and maintaining archives (Rindzevičiūtė 2019; 2021).

The complexity of NCH requires engagement in diverse practical and theoretical heritage processes (Ross 2023). Combining CHS and NCH concepts addresses the inherent tension within nuclear cultural heritage, the inevitable loss of its physical remnants, and the ongoing presence of radioactive materials and their cultural meanings (Holtorf and Högberg 2020). In the context of this research, these heritage concepts transform relics of the atomic age into spaces for reflection, negotiation, contestation, and future responsibility.

1.2.3 Visual Studies

Visual studies refers to a conceptual framework that examines the practices and practitioners of visual culture, particularly visual production within specific contexts shaped by norms, institutions, the affordances of digital technologies, and representational power dynamics (Bareither 2021; Rose 2023). *Nuclear visual culture* transforms culturally shared elements of nuclear technology into visual narratives that shape public perception and grapple with themes of risk and the hopes of the nuclear era (Fields 2020; O'Brian 2015). This research addresses images that shape cultural ideas about existing post-nuclear landscapes and negotiate experiences and assumptions of techno-human conditions and relationships (Volkmar 2022).

By directing analytical focus towards participatory visual culture, the aim is to improve our understanding of what is made visible, who can see it, and how seeing, knowledge, and power are interconnected (Hooper-Greenhill 2000). This dissertation underscores the importance of the visual aspect, emphasising the visual construction of social realities rather than merely the social construction of vision (Mitchell 2005, 343). In the context of CHS and NCH, the visual component elaborates on the role of images in constructing nuclear heritage narratives and imaginaries and how places are experienced and imagined as heritage sites (Waterton and Watson 2010; Watson and Waterton 2010).

1.2.4 Co-Creation

Closely aligning with the CHS understanding of heritage as multivocal and contested, participatory co-creation frames heritage as a dynamic, enacted, and socially constructed process that challenges purely authoritative modes of heritage management and heritage as a static pre-existing entity (Crouch 2010; Haldrup and Bærenholdt 2015; Harrison 20212; Nash 2000). Rather than passive reception, visitors actively interact with historical sites, monuments, and artefacts, deriving new ideas and meanings through experience and interpretation (Ross 2020; Smith 2021). This participatory framework invites a rethinking of the relationship between institutional heritage structures and individual agency, foregrounding shared authorship, collective meaning-making, and the collaborative enactment of experience as a material-discursive heritage praxis (Ross 2020; Russo and Watkins 2007)

This dissertation specifically links co-creation to visitors' creative actions and their collaborative roles in shaping heritage space through performativity, experience, and semiotic marks (Hilmar 2015; Lean et al. 2014). At nuclear disaster sites, such co-creative practices take the form of photography, shared exploration, and collective narration, through which heritage meanings are jointly constructed

and continuously renegotiated. Cultural heritage is thus understood as an iterative, imaginative process of assimilating new information and reinterpreting the past (Crouch 2010; Antón et al. 2018), one in which photography praxis emerges as a central strategy of meaningful visitor engagement.

1.2.5 Participatory Culture

Digital participatory culture (Giaccardi 2012; Jenkins et al. 2009; Jenkins 2019) provides an additional means of accessing the visuality of nuclear heritage by recontextualising its meanings and facilitating symbolic production (Zhukova 2016). Jenkins (2009; 2019) defines participatory culture as a community in which individuals are not required to contribute but believe they are free to do so when ready, and that their contributions will be appropriately valued. Fuchs (2014) further emphasises that the concept recognises practitioners not as mere consumers but as producers and contributors. Participatory culture thus concerns heritage practitioners who engage with the interpretation, production, and co-creation of a given site outside institutionalised discourse.

The use of social media platforms such as Flickr, Facebook, and Instagram, characterised by fluidity and participation, demonstrates that heritage is practiced in extra-discursive spaces (Thouki and Skrede 2025, 4), where visitors' photographs and digital practices create new image environments that extend beyond the physical site. The image praxis includes staging, exploring, framing, and sharing, which go beyond mere preservation and transmission of heritage. Instead, heritage is co-created through dialogue, negotiation, and interaction on participatory online platforms, shaping the public sphere collaboratively (Apaydin 2018; Bareither, 2021; Frosh 2001). The discursive public sphere, photography, and participatory communities have opened up new ways to engage with nuclear heritage sites and generate knowledge about heritage through communicative acts. These acts serve as signification practices, forming the core focus of this dissertation.

1.2.6 Participant-Generated Photographs

The methodological concept of participant-generated images (PGI) is rooted in a participatory research tradition that seeks to decentre expert authority. Instead, participants are actively involved in the design and outputs of the project as co-creators (Rose 2023). In this research, visual materials, specifically digital photographs, are created by research participants. This method is employed in this study to gain deeper insights into the experiences, perspectives, and cultural contexts of participants and sites of visitation, and into the medium of social media as a powerful communication tool that disseminates the nuclear imaginaries

The method is a relatively novel approach within nuclear cultural heritage studies and allows for a more direct examination of the distinct yet interrelated roles of participants, offline and online realities, and image creation (Harper 2012; Rose 2023). The PGI also shifts audiences from passive consumption to the creation and dissemination of visual narratives, transforming images into social artifacts and forms of knowledge (Horn 2018; Sluis 2022), thus allowing insights into the processes that, through nuclear objects, transform into cultural symbols and communicative events.

1.2.7 Photography

The final conceptual tool used in this research is photography. Nuclear heritage and photography share an intrinsic history; photographic images have been instrumental in shaping the uses and meanings of nuclear technology (O'Brian 2015). Photography plays a constitutive role in shaping how nuclear heritage is perceived, valued, and understood across different publics and stakeholder groups. Certain images, symbols, and pictorial conventions do not merely reflect nuclear heritage but actively regulate its meanings, delimiting what is rendered visible, memorable, or worthy of preservation (Waterton and Watson 2010; Waterton and Watson 2014). Photography in this study aligns with the broader framework of CHS, moving beyond its view as just a tool for documentation to be seen as a performative practice that actively influences how heritage is constructed, experienced, and challenged (Bærenholdt et al. 2004; Larsen 2006; Sterling 2016; 2020).

In this research context, where PGI is used to depict radioactively contaminated areas, the photograph is understood as a network of relationships, technologies, institutions, social practices, and emotional responses that together shape how heritage is visualised and interpreted (Dewdney and Sluis 2023). This shifts the focus of this dissertation to explore how photographs function *within the fabric of everyday heritage practices* and how visual culture influences what we remember, value, and transmit. It specifically allows for analysing how acts of heritage-making arise through visitor perspectives and how photographs are integrated into cultural memory (Sterling 2020).

In this section, I have presented the main theoretical and conceptual framework, grounding this dissertation research in critical and nuclear heritage orientations. These theoretical branches enable the investigation of how cultural narratives and societal values shape what is remembered, forgotten, or contested as heritage. Alleviating the understanding of heritage as an activity and *a verb*, I further introduced the concepts of visual culture and co-creation, which, as indicated in this research, elaborate on the role of images in constructing heritage narratives and on how places are experienced, performed, and imagined as heritage sites (Waterton

and Watson 2010; Waterton and Watson, 2014). Supplementing these concepts with further operational and methodological stances, I advanced the research design by introducing a participatory approach; the research is guided by the idea of "heritage from below," and employs the novel method of participant-generated images (PGI) in NCH studies. Lastly, I provided a brief definition of photography and its conceptualisation in the context of this research, understanding photography as a network of social artefacts that contribute to the emergent public sphere. A more detailed theoretical discussion will be provided in Section Two, but before that, I would like to introduce the history of nuclear accidents in Ukraine and Japan, along with the subsequent designation of these accident sites as emerging nuclear heritage sites.

1.3 History of the Worst and Second-Worst Nuclear Accidents of Humankind

The accident that occurred in Chornobyl nuclear power plant (CHNPP) on April 26, 1986, and the one that took place 25 years later in Fukushima Prefecture, at the Daiichi power plant (FDNPP) on March 11, 2011, are classified on the International Nuclear and Radiological Event Scale (INES) as a level 7, which signifies the end of the scale as a major accident. The disasters have very different storylines, but the results are largely the same: vast amounts of radionuclides spread into the environment, causing evacuations, ecological damage, and long-term health impairments. The policies implemented in the aftermath of the FDNPP accident are in stark contrast to those introduced after Chornobyl (Kawasaki 2020; 2023). In the case of Chornobyl, the return of the evacuees was never an option, whereas in the case of Fukushima, the plans for the removal of the evacuation status and the return to the closed areas have been an ongoing project since 2015 (Gerster et al. 2021)

The explosion at the CHNPP ranks among the most severe technological catastrophes in recorded history and remains the worst accident in the history of nuclear power (Fitzgerald 2023; Chernousenko 1991; Medvedev 1990). The sequence of events is well-documented (Chernousenko 1991; Marples 1988; Mahaffey 2014; Medvedev 1990; Plokhy 2020; Shcherbak 1989), and the incidents continue to be translated into ever-new representations, signifying the broader global context of Chornobyl, which addresses questions of post-apocalyptic survival in the modern world at large (Hundorova 2019, 41). During a routine shutdown test of Reactor 4 at the Vladimir Ilyich Lenin Nuclear Power Plant in the Ukrainian Soviet Socialist Republic, a sudden and uncontrolled power surge caused the reactor vessel to rupture, releasing millions of curies of radioactive material into the atmosphere. These radioactive emissions were subsequently dispersed by winds and air currents across large parts of the Northern Hemisphere, including much of Europe.

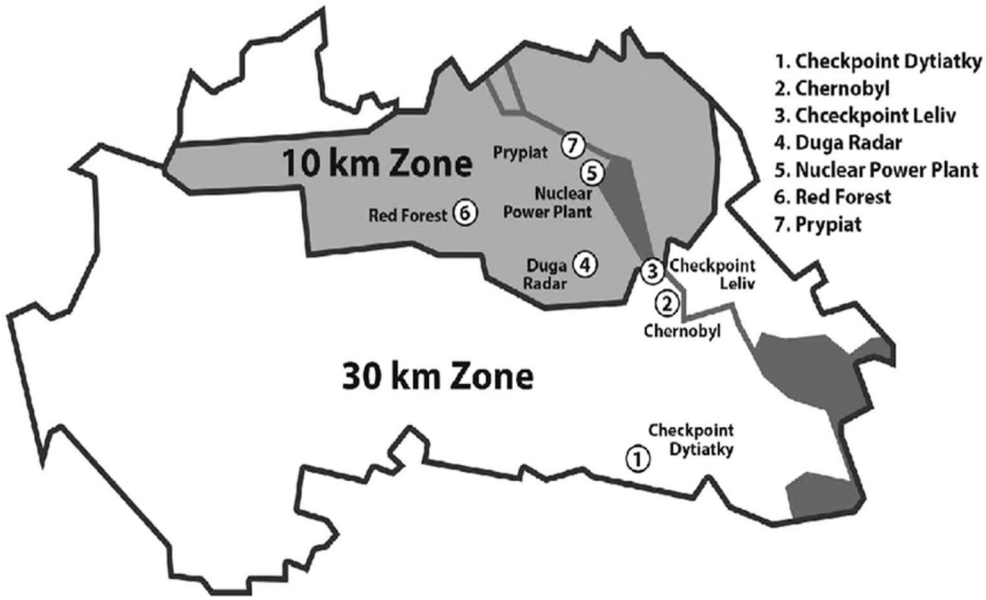


Figure 3. The Chornobyl Exclusion Zone, Source: Magdalena Banaszkiewicz (2023).

The disaster resulted from a convergence of defective reactor design, human error at multiple organisational levels, and a deeply inadequate safety culture. The destruction of Reactor 4 and the ensuing radioactive releases led to the deaths of 30 firefighters and plant workers in the weeks that followed. In response, around 200,000 people, known as "liquidators", were mobilised from across the Soviet Union to decontaminate the area and to construct a protective sarcophagus around the damaged reactor. As the clean-up intensified over the following months and years, the number of liquidators rose to between 650,000 and one million (Chernousenko 1991, 43). Many were transported to the site to perform tasks ranging from removing and burying contaminated topsoil to working in minute-long shifts on the roof of the destroyed reactor, where they shovelled highly radioactive debris and fragments of graphite back into the core. Official figures report that 25,000 liquidators have since died (Smith and Beresford 2005), although the true death toll remains the subject of considerable debate. The treatment and long-term consequences faced by those involved in the clean-up constitute one of the most troubling aspects of the Chornobyl legacy.

The purpose-built city of Pripyat, founded in 1970 to house workers at the nuclear plant and their families, was evacuated on April 27, 1986. About 50,000 residents were transported to various regions, where families and collective farms temporarily accommodated them. Within ten days, a total of 116,000 people living within a 30-kilometre radius of the reactor had been relocated (Smith and Beresford

2005). This territory was officially designated the Chornobyl Exclusion Zone (CEZ) and continues to require special authorisation for entry. The large-scale resettlement produced profound social and economic consequences (Chernousenko 1991; Petryna 2013; Smith and Beresford 2005; Yaroshinskaya 2011), including the loss of livelihoods, social ties, culturally and historically significant places, and homes, land, and ancestral burial sites.

In Ukraine, the officially stated size of the territory that has been exposed to radioactive pollution is more than 100,000 square kilometres (Chernousenko 1991). Since the original designation of a 30-kilometre exclusion zone (2,800 km²), its boundaries have been repeatedly revised. By 2005, the Zone had expanded to more than 4,700 square kilometres, encompassing territories in north-western Ukraine and southern Belarus, all of which have been officially classified as uninhabitable because of radioactive contamination (Higginbotham 2019). Today, the CEZ is administered as the Polesia State Radiological and Ecological Reserve, forming a unified administrative territory that includes both the Zone of Exclusion and the Zone of Unconditional (Mandatory) Resettlement under the authority of the State Exclusion Zone Management Agency (SEZMA). Approximately five million people continue to live in contaminated areas of Belarus, Russia, and Ukraine, including about 100,000 residents in zones officially designated as being under "strict control" (WHO 2020).

These figures underscore the challenge of understanding the true scale and impact of the disaster. Simultaneously, efforts to quantify those affected are inherently politically charged (Goatcher and Brunsden 2011; Petryna 2013). Estimates of death tolls and long-term health effects vary widely, from radioactive fallout affecting large parts of northern Europe to generational health problems in exposed populations (Stone 2013, 79). To provide context, the UN Chornobyl forum estimated that the death toll could be between 4,000 and 9,000, while Greenpeace's estimates reached up to 200,000 deaths (CBC News 2006). Immediately after the event, Soviet authorities aimed to minimise the accident's scale, while critics and opponents often emphasised and exaggerated its effects (Chernousenko 1991; Medvedev 1990; Petryna 2013; Yaroshinskaya 2011). Over time, Ukrainian government agencies, international NGOs, and the nuclear industry have employed different criteria to assess impacts, reflecting conflicting political, medical, and economic priorities. As Petryna (2013) demonstrates, Ukraine's approach to defining and counting "affected" citizens is driven by motivations that differ significantly from those of medical and compensation agencies.

The long-term consequences of the disaster, including its social and psychological effects, remain contested and subject to ongoing research. Decamous (2018, 260) indicates that predicting the potential extent of the radiation-related casualties on human life, wildlife, and the environment remains a near impossibility.

And for many people, the accident continues to be experienced as an ongoing trauma. The multiple controversies surrounding Chornobyl, its unprecedented character, the creation of the Zone, and the enduring uncertainty about its impacts have all contributed to its powerful symbolic status (Dobraszczyk 2010). The imprecision of the figures cited above, together with the difficulty of grasping the disaster's full scope, has arguably helped to produce a mythologised image of Chornobyl. The murals of Pripyat have become among the most photographed and widely circulated images from the Zone, shaping global memory of Chornobyl and anchoring the site within imaginaries of technological hubris and the transience of ideological certainty (Figure 4).

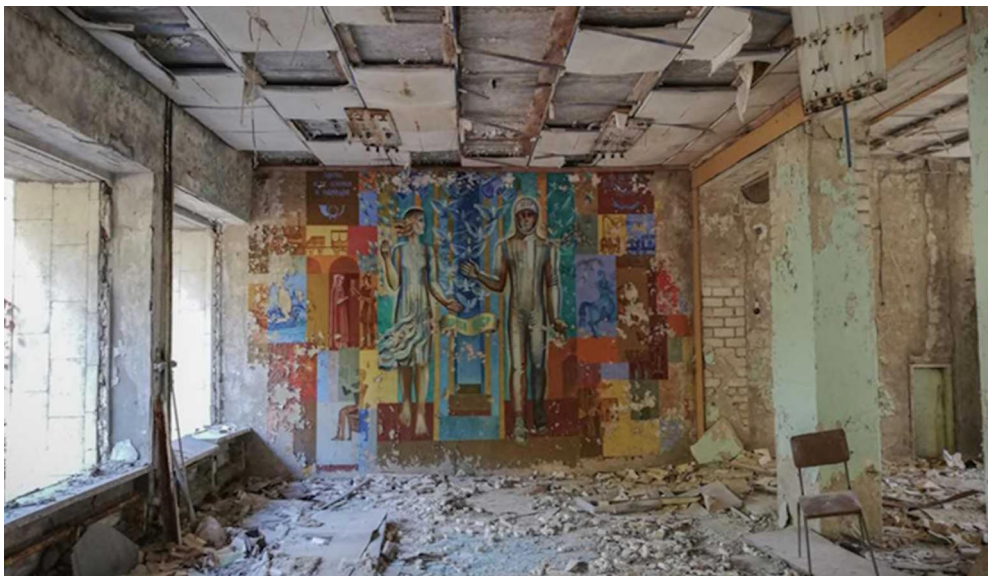


Figure 4. Pripyat's post office mural. Photograph taken in October 2019 by Veera Ojala.

1.4 The Great Eastern Japan Triple Disaster

In March 2011, the devastating 9.0 magnitude earthquake in Japan triggered a massive 14-meter tsunami. The tsunami overwhelmed the power plant's seawall and flooded the backup diesel generators, which were critical for cooling the reactors. This historic natural disaster caused the Fukushima nuclear accident at the Fukushima Daiichi Nuclear Power Plant (FDNPP), operated by Tokyo Electric Power Company Holdings (TEPCO). The power plant is located in Futaba town, in Fukushima prefecture, approximately 240 kilometres northeast of Tokyo. The flooding caused a station blackout, disabling the cooling systems for Reactors 1, 2, and 3. Without the cooling, the reactors overheated, leading to partial meltdowns.

As a result of the overheating of the fuel rods, hydrogen gas accumulated in the reactor buildings, and between March 12 and 15, hydrogen explosions occurred in Units 1, 3, and 4, causing severe damage. Significant amounts of radioactive materials and nuclear fission products, including iodine-131, cesium-134, and cesium-137, were released into the atmosphere, the Pacific Ocean, and the areas surrounding the power plant (Pareniuk and Yasuda 2021).

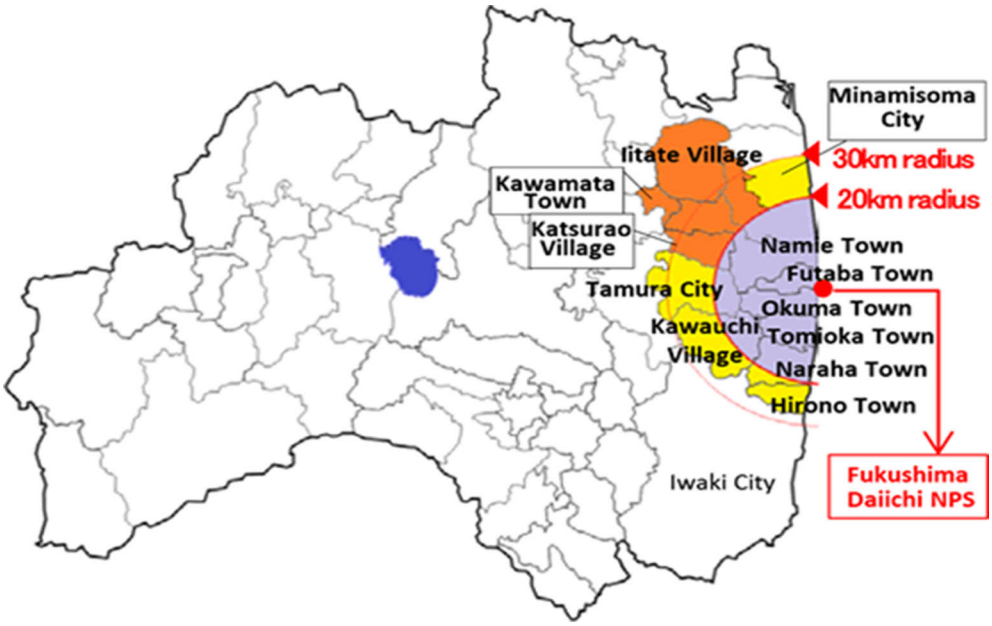


Figure 5. Evacuation areas in Fukushima prefecture. Source: Fukushima Revitalization Information Portal Site (2025).

The severity of the crisis is unparalleled; the complexity of the disaster exemplifies a compound catastrophe, which is also haunted by memories of the destruction caused by atomic bombings (Figueroa 2018b, 59). Over three days, the evacuation zone expanded from a 3-kilometer radius to a 20-kilometer radius. In the coastal region of Tohoku, roughly 400,000 people were evacuated, of whom 160,000 were forced to flee due to nuclear disaster (Kawasaki 2024; World Nuclear Association 2026).

There have been no deaths or cases of radiation sickness reported officially; figures show that there have been 2,313 disaster-related deaths among evacuees in addition to the 19,500 that were killed by the earthquake or tsunami (World Nuclear Association 2026). The polluted area covered about 1,150 square kilometres, impacting numerous towns including Iitate, Odaka, Futaba, Namie, Okuma, Yonomori, and Tomioka. In some parts of these regions, the disaster's nature was

ultimately nuclear, as the tsunami wave did not reach the remote sections of these cities. In other areas, the infrastructure was damaged by the earthquake, the tsunami, and radioactive contamination. These varying impacts of the triple disaster created different spatial conditions and varying responses, which also shape its evolving commemoration cultures.

As in the case of Chornobyl, decontamination efforts at Fukushima have also required a large workforce. Approximately 5,500 personnel are involved in the clean-up at the Daiichi NPP site (Figueroa 2016). Decontamination and decommissioning at the power plant are complex due to reactor damage and are currently estimated to take 30—40 years to complete. Activities at the power plant (Figure 6) include various stabilisation, clean-up, and containment efforts. The process of removing the spent fuel is completed in reactors 3 and 4, and the removal of fuel debris in reactors 1, 2, 3, and 4 presents the most formidable challenge of the decommissioning process, as the extreme levels of radiation prevent workers from entering the reactors. The work has to be conducted with the assistance of a robotic telescopic arm (Nippon.com 2026). Another crucial task involves managing the contaminated water. In 2023, TEPCO began releasing water containing tritium into the Pacific Ocean, which is planned to take place over several decades.

Figure 6. Fukushima Daiichi Nuclear Power Plant (FDNPP). Photograph taken in May 2025 by Veera Ojala.

In the wider contaminated area in Fukushima Prefecture, clean-up efforts have involved removing contaminated soil and demolition of damaged infrastructure (Kawasaki 2023). Over 14 million cubic meters of soil have been collected from the surrounding region and are being processed at the Interim Storage Facility Site (Figure 7), which used to house 2,700 residents before the disaster. Over the next 20—30 years, as contamination levels decrease, roughly 75% of the recycled soil will be used for civil engineering structures such as seawalls, embankment for roads, railroads, and coastal protection. A final, permanent disposal site for the heavily contaminated soil is to be selected by the government by 2035, with a view to completing final disposal outside Fukushima Prefecture by 2045 (IAEA 2024).

The management of the remaining radioactive areas in the Fukushima prefecture, the gradual dismantling of the Daiichi power plant, the opening of the cleaned parts of the municipalities, the deconstruction and reconstruction of the infrastructure, and the revitalisation of the social fabric are the current activities taking place in the area. The controversies surrounding the compensation process of the evacuees, the lack of reliable information about the health issues caused by the disaster, and the distrust against the government are pressing issues in the area (Kawasaki 2020; 2023).

In Fukushima, the tension between institutionalised and grassroots memory narratives regarding the recovery processes and commemoration of the nuclear accident and its effects is a contested topic (Geilhorn and Iwata-Weickgenannt 2018; Figueroa 2018a; 2018b). The reopening of the area and the rebuilding of the former cityscapes disrupt the memories of past residents and communities. The area is rapidly changing and developing, but the social fabric that should guide these processes and give the cities their character is still largely absent. During my fieldwork in Fukushima, I found these dissonances of the landscape and the difficulties in articulating these layers and disruptions of memory cognitively to be one of the most challenging aspects of the post-disaster Fukushima.

Figure 7. Interim Storage Facility in Okuma, Fukushima prefecture. Photograph taken in May 2025 by Veera Ojala.

1.5 The Zone Becomes a Tourist Attraction

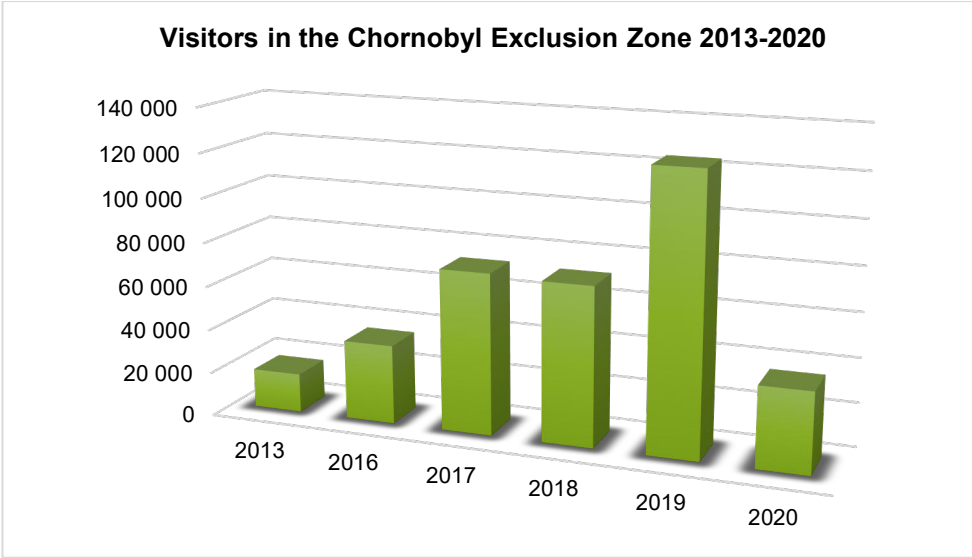
The Zone was established on May 2, 1986, six days after the explosion at the power plant, with Figure 8 depicting a Soviet architectural style bus stop at the main entrance "Dytyatky" of the CEZ. The term "Exclusion Zone" conceals the fact that the area has never been a fixed or fully bounded space. Since the disaster, its borders have been repeatedly negotiated and crossed by self-settlers, scientists, looters, and unauthorised explorers. Even before tourism was formally established, the CEZ had become a popular destination for so-called Stalkers and urban explorers, some of whom reportedly entered the area illegally for nearly a decade before the introduction of official tours (Banaszkiewicz et al. 2017; Stone 2013).

The first authorised visit to the Zone took place in 1999 (Banaszkiewicz et al. 2017). From the mid-1990s onward, administrative structures were gradually developed to manage visitors (Banaszkiewicz et al. 2017; Goatcher and Brunsden 2011). The initial government body responsible for these activities was the International Information Cooperation and Development Agency, ChernobylInterInform, which subsequently worked with several tour operators to organise guided trips into the Zone.

Figure 8. Dytyatky bus stop at the border of the Chornobyl Exclusion Zone checkpoint. Photograph taken in September 2019 by Veera Ojala.

Tourism to the CEZ has evolved through distinct stages. The first phase, spanning from 1991 to 2010, can be described as proto-tourism, marked by the initial exploration of the Zone's potential for visitation amid the political instability and institutional transformations of the post-Soviet era (Banaszkiewicz 2023). The second phase, from 2011 to 2016, began with the official decision to open the Zone to visitors in 2011, initiating a period of rapid growth and the formation of organised tourism practices (ibid.). The third phase, from 2016 to 2021, represented the era of mass tourism, as visitor numbers increased exponentially prior to the disruptions caused by the COVID-19 pandemic and the full-scale Russian invasion in February 2022. The year 2019 was a record year with 124,000 visitors (Table 2), the mature phase being characterised by the consolidation of top-down management structures, the establishment of tourism infrastructure, and the institutionalisation of Chornobyl as a global heritage attraction (Banaszkiewicz 2023, 76).

Table 2. Tourism in the CEZ 2013-2020. Source: State Exclusion Zone Management Agency, 2025.



The Zone has been officially open to tourism since 2011, with access regulated by the SEZMA through an entry permit system. This decision was guided by radiological studies identifying areas and routes safe for visitor movement (Banaszkiewicz et al. 2017, 151). Concurrently, a new governmental body and a set of regulations were introduced. All visitors were required to sign an agreement acknowledging awareness of potential risks, thereby releasing tour operators from liability. Since 2011, entry into buildings within the Zone has been officially prohibited due to the danger of structural collapse. Access is further regulated through mandatory accompaniment by a licensed guide or Zone administration representative, along with payment and formal approval from the agency, all of which are verified at the main checkpoint in Dytyatky (State Exclusion Zone Management Agency, 2025). This regulatory framework forms a significant backdrop for understanding the development of the Zone's tourism. While designed to manage safety and control access, these policies also shaped how tourism practices evolved, often through subtle negotiations of spatial freedom and interpretive engagement with the Zone (Article I; Article II; Article III).

The marketisation of the Zone produced a distinctive visitor economy. In response to increasingly diverse tourism demands, a wide range of tour formats emerged, from standard one-day visits to fully customised, multi-day private tours. Members of the Ukrainian Stalker subculture also offered so-called "Stalker" or "illegal tours" as alternatives to mainstream tourism (Chernobyl Explorer 2025;

Chornobyl Urbex Tour 2025). Whilst conducting fieldwork in Chornobyl and Kyiv, I joined Stalker-organised activities, including a gathering by Lisove Lake, depicted in Figure 9, during warm September weather, and later a rave organised by a rival Stalker group on the border of the CEZ. These engagements, alongside interviews with community members, provided analytical depth regarding Stalkerism and the Zone as a cultural text that has been shaped by various fictional references. The membership was predominantly Russian, Belarusian, Ukrainian, and Polish, offering a lens through which to understand Eastern European understanding of the Zone as inheritance (Banaszkiewicz 2022).

Figure 9. Members of the Stalker subculture in Kyiv. Photograph taken in September 2019 by Veera Ojala.

The diversification of the tours and visitors' profiles reflects a central tendency in the heritagisation process of the CEZ: photography became a particularly pronounced way of engaging with the site and the requirement to negotiate spatial privileges (Article I; Article III). Thus, this dissertation research originated from the need to understand the relationship of photography, the dynamics of the participatory community of radioactive sites as agents of heritage *per se*, and visitors' *visual meaning-making* as a starting point.

Figure 10. Popular photo spot in an elementary school in Pripyat. Photograph taken in October 2019 by Veera Ojala

Academic interest in tourism to the CEZ began to take shape in the early 2010s, primarily framed within the paradigm of dark tourism (Goatcher and Brunsden 2011; Stone 2013; Yankovska and Hannam 2013), which emphasises the site's associations with disaster and tragedy. Interest in visiting the Zone is arguably evoked not only by its visual representations but by a broader photographic nuclear visual culture, shaped in turn by the affordances of digital devices and platforms (Article III; Article IV). The dark tourism paradigm alone is therefore insufficient to capture the full complexity of nuclear disaster tourism: the wider nuclear visual culture and the capacity of digital photography to interpret, *invite us,* and communicate these sites form an equally important underlying context.

Figure 10 illustrates the Zone as a site of photographic dissemination and imaginary communication of technological risk. It depicts a well-known photographic spot in one of Pripyat's primary schools, a location that has evolved over the years and has been captured in numerous versions by different photographers. Recurring elements such as a broken television set, a book, gas masks arranged on a desk, and other items scattered across the floor have become recognisable fixtures of Chornobyl's visual imaginary, testifying to the Zone's carefully, if informally, curated iconography, ultimately intended to produce conviction. The broader visuality of nuclear culture comments on these image-practices and "forms of experimenting with and exploring a space that is inaccessible to knowledge based on experience or observation" (Horn 2018, 16). Such a mnemonic community is organised around *the feeling of catastrophe rather than its*

knowledge, shaping the way NCH is understood and visualised. Across the articles comprising this dissertation, I argue that nuclear visual culture operates as an emergent constituent of material heritage, and that understanding its curatorial practices therefore requires critical engagement with visual imaginaries and with how these actions invoke and enable connections to the past.

By examining nuclear cultural heritage through the lens of visual culture, this study takes a distinct position compared to previous research on the topic. Earlier studies have approached the CEZ from various perspectives, for instance, through the experiences of tour guides (Banaszkiewicz 2023; Rush-Cooper 2013; Yankovska and Hannam 2013) or from the viewpoints of former residents reflecting on tourism and its meanings (Davies 2015; Yankovska and Hannam 2018). Hutchings and Linden (2018) analysed the online content of Chornobyl tour operators, proposing the concept of "existential tourism" to interpret the narratives presented on these websites. Similarly, Goatcher and Brunsden (2011) based their study on photographs uploaded to the Pripyat.com website, exploring visual traces of engagement with the Zone. In addition, various authoritative and professional image practices have gained scholarly attention through works such as Bürker (2014), Richardson (2026), and Volkmar (2022).

More recent scholarship has turned attention to embodied responses and interactions with contested heritage (Farkić 2020; Hryhorczuk 2019; Rush-Cooper 2020). Laaksonen and Varga (2023) further extend this field by examining visitors' use of selfies to perform identity in the Zone. Given that perceptions of the CEZ are profoundly shaped by visual representation, the site offers a particularly fertile ground for investigating the interrelations between vernacular photography, meaning-making, and heritage. This growing scholarly interest is evident in recent contributions by Duda (2023), Farkić and Kennell (2021), and in the author's own articles (Article I; Article III; Article IV). This latter research branch frames the visual imaginary as an active agent in shaping the afterlife of the disaster and contributes to the discussion on *the significance of nuclear heritage through a visual context.*

The CEZ was, before the global COVID-19 pandemic and the Russian attack on Ukraine, in the process of gradual marketisation as an international tourism destination, and the influx of tourists had increased exponentially. These two crises interrupted the evolving process of tourism and heritagisation, as those were taking place before 2020; and to this day, the future of the Zone remains open. The current geopolitical situation does not erase the CEZ from visual imagination; rather, it reinforces its presence within the circuits of global visual culture. The CEZ continues to be powerfully mediated through photography and user-generated content, with many established social media platforms dedicated to its commemoration remaining active and viral. The site thus operates as a dynamic node within nuclear visual

culture, where images are not only representations but active agents in producing collective memory and meaning (Sterling, 2020). Examining these dynamics reveals how the visual mediation of the nuclear disaster sites extends beyond the place itself, offering critical insights into the broader logic of contemporary visual culture and collective imaginaries as memory work.

In the CEZ, the potential future scenarios did not involve reopening the area. Therefore, the imaginative horizons in the CEZ construct nature's role as a "nuclear wilderness" (Cram 2016) that can recover and reclaim the site, where gradually disappearing infrastructure carries complex symbolic meanings and significance from the past through the visual discourses of decay and time capsule curatorialship (Article III; Article IV). The Fukushima area stands in contrast to this; the policies implemented are concerned with removing the evacuees' evacuation status, decontaminating and rebuilding the area, and eventually reclaiming the area's status under the discourse of normalisation (Kawasaki 2023; 2024).

1.6 Developments of the Fukushima Triple Disaster Area

Figure 11. Difficult-to-return zone in Fukushima prefecture, Okuma town. Photograph taken in May 2025 by Veera Ojala.

The areas affected by the Fukushima Daiichi nuclear disaster are commonly grouped under the collective term "Fukushima Exclusion Zone" (FEZ) (Duda and Jimura

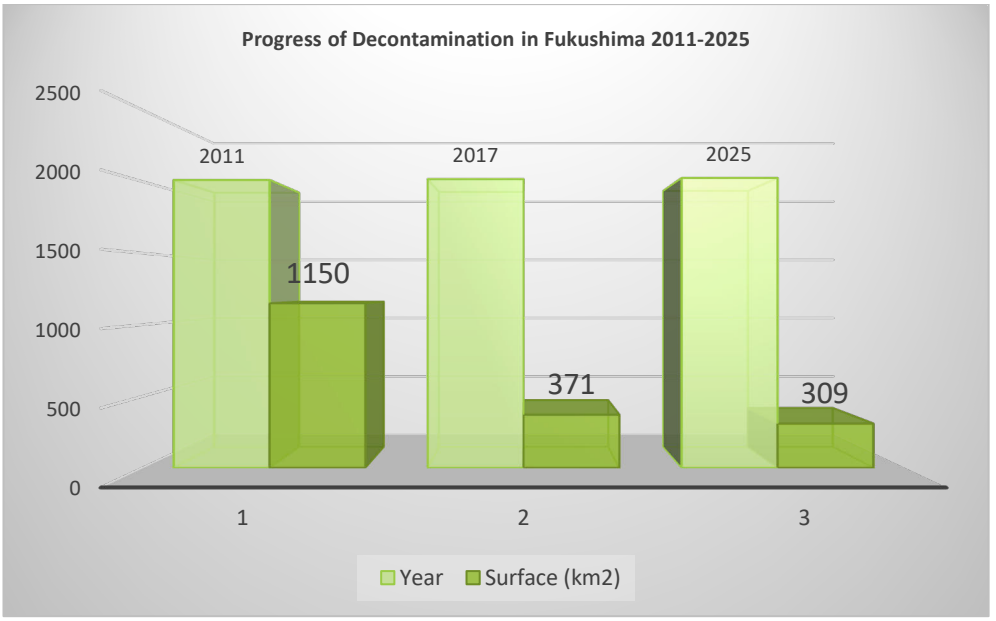
2025). However, this label oversimplifies a considerably more complex spatial and temporal reality. Since 2011, the zone initially delineated (roughly a 30-kilometre radius around the power plant) has been subdivided into several distinct categories based on radiation levels, access restrictions, and plans for return. The categories are (Fukushima Revitalization Information Portal Site 2026):

- Difficult-to-return zones: Highly contaminated and considered largely uninhabitable. Access is severely restricted, and evacuation orders remain in force for much of these areas (Figure 11).
- Restricted residence zones: Areas with elevated radiation risk where access and habitation are limited; decontamination is underway, infrastructure is partially in place, but many services are not fully restored (Figure 12).
- Zones being prepared for lifting of evacuation orders: Areas in which radiation levels have dropped, decontamination work and infrastructure restoration are progressing so that evacuation orders may be rescinded (Figure 13).

This division reveals how misleading the term "Exclusion Zone" can be, given the considerable fragmentation that persists. The term also draws its imaginaries from the CEZ, arguably transferring similar post-nuclear attributes onto Fukushima (Article IV). Even within cleared or partially cleared zones, patches of forested, mountainous, or formerly inhabited land remain in varying states of contamination or restricted access. Spatial fragmentation is a defining characteristic of the area: reconstructed neighbourhoods sit adjacent to forested slopes where contamination persists, and comprehensive decontamination is technically unfeasible. Forests in particular remain long-term reservoirs of radioactive caesium, acting as sources of recontamination for settled areas and limiting which parts of municipalities can realistically be repopulated (Schreurs 2021). For these reasons, I avoid the term "Fukushima Exclusion Zone" in favour of "Fukushima (Triple Disaster) area."

Beyond the differing characteristics of the contaminated areas, a crucial distinction between Chornobyl and Fukushima lies in post-disaster policy. Whereas Soviet-era responses favoured migration-based policies that encouraged or compelled residents to leave, Japan has pursued return-based policies enabling evacuees to return to their hometowns (Kawasaki 2023).

Table 3. Results of the decontamination process in Fukushima. Source: Fukushima Revitalization Information Portal Site (2025).



In March 2013, the Fukushima Recovery and Revitalization Headquarters introduced the "Early Return and Resettlement Plan" to accelerate evacuee return through infrastructure restoration (Kawasaki 2023). Revitalisation efforts gained further momentum by the end of that year, and in 2014, the first evacuation orders in Fukushima Prefecture were lifted.

Since 2015, the footprint of evacuation-designated land has shrunk substantially as areas were reclassified and orders lifted, from an initial 1,150 square kilometres to approximately 371 square kilometres (Table 3). Nationwide reconstruction and infrastructure repair have advanced considerably, with many public works now complete. Concurrently, the number of evacuees has fallen from hundreds of thousands in the immediate aftermath to roughly tens of thousands in recent years (Fukushima Revitalization Information Portal Site, 2026). The stated aim is to lift evacuation orders across the entire area, including the most contaminated Difficult-to-Return Zones (Figure 11), and ultimately to dissolve the evacuee category altogether (Kawasaki 2023; 2024). However, despite the legal and institutional reduction of evacuee status, actual return rates in areas where orders have been lifted remain at only 10–20 per cent (Kawasaki 2023, 35).

Figure 12. Abandoned house in Fukushima prefecture, in Namie city. The area belongs to "Restricted Residence Zones". Photograph taken in May 2025 by Veera Ojala.

Following the disaster, recovery efforts focused on decontamination, demolition, and rebuilding. Many areas are now considered safe, yet return rates remain low; farms and businesses continue to suffer from both tangible economic damage and the stigma of radioactive contamination. Effective revitalisation requires multi-dimensional approaches encompassing health, housing, employment, income, family support, and long-term legal frameworks for evacuees and returnees (Kawasaki 2023; Martini and Sharma 2022). Low return rates reflect a confluence of factors: persistent radiation concerns, agricultural and commercial losses, diminished services, disrupted social networks, and personal decisions about livelihood and wellbeing, and make clear that formal reopening does not automatically produce repopulation (Polleri 2025).

Different labels characterise the influx of visitors to the nuclear disaster sites. Whilst studies of the CEZ predominantly employ the concept of dark tourism (Stone 2013; Yankovska and Hannam 2013; 2018), the Fukushima triple-disaster area provides interesting contrasts due to the conceptualisation of visitation under the concept of hope tourism (Gerster and Maly 2022; Gerster et al. 2021). The relationship between dark tourism and hope is not immediately obvious, and these concepts should not be seen as forming the opposite poles of a continuum. Hope tourism is technically part of dark tourism practices, but hope tourism was exclusively designed for Fukushima as a marketing concept, along with other forms of revitalisation tourism in the Tohoku area (BOSAI Tourism and Recovery tourism) (Gerster et al. 2021).

In Japan, dark tourism has been developed and adopted, with a primary focus on educational elements, which is connected to the long history of educational tourism and backlash against dark tourism (Jang et al. 2021). Tourism activities started to evolve in the prefecture in 2016, aiming to promote a learning experience (Gerster et al. 2021, 18). Hope tourism does not solely emphasise recovery; it is a mixture of educational dark tourism (Martini and Minca 2021). Visitors engage with the painful memories of the site with the ultimate purpose of evoking a change and bonding with the residents of the area. This becomes a source of hope for the residents and revitalisation (Gerster et al. 2021). Fukushima is comparatively understudied as a heritage site; the literature on Chornobyl dominates the discussion, which also elaborates the fact that visitation to Fukushima is a secondary aspect, and the visitation infrastructure would develop as a side consequence to the development and recovery (Duda and Jimura 2025).

As a result, the prevalent framework for tourism in Fukushima Prefecture is "hope tourism," which minimises associations with death and danger in favour of educational content centred on safety efforts and survival, positioning Fukushima as a symbol of revival (Gerster et al. 2021). Several tour operators are active in the area, including "Real Fukushima" and "Japan Wonder Travel" alongside tours provided by Fukushima Prefecture, TEPCO, and the Interim Storage Facility.

In 2022, Fukushima received 17,806 visitors (Zenbird Media 2025), a figure that underscores the markedly different visitor dynamics compared to the CEZ (Table 2). Guided activities foreground reconstruction, community resilience, and decontamination processes, and such visits have been actively promoted by local and national actors as part of broader efforts to rehabilitate Fukushima's image and support the local economy (Kim and Kim 2023). Nevertheless, questions surrounding ethics, representational practices, and the role of visitors in co-creating narratives of recovery remain central to ongoing research (Article IV).

In contrast to Chornobyl, the decontamination and rebuilding of the Fukushima disaster site has opened up drastically different imaginative horizons. The triple-disaster area stands as a blueprint for post-nuclear rehabilitation, raising pressing questions about the continuation of life in post-disaster landscapes. The revitalisation is an authority-driven process that is criticised for neglecting the lived experiences of locals, which reveal that the disaster is ongoing, not resolved, and that decontamination is partial and misleading (Kawasaki 2023). Resettlement policies have created injustice (Bass 2026). The overall discourse of normalisation effectively veils the efforts of Japanese authorities to expand nuclear power regardless (Bass 2026; Decamous 2018). An expert interview conducted for Article IV with an art curator in January 2025 offered an insightful perspective on the importance of investigating the complexity of post-nuclear sites:

> *"This is also very interesting when it comes to what it means to live in a contaminated area, what it means to live in an area that's experienced not only the trauma of settlement but the trauma of contamination and debilitating contamination. And how life and the capitalist economy continue in those areas."*
>
> — Respondent 13 (Article IV)

The quote foregrounds the layered nature of trauma in post-nuclear landscapes, distinguishing between the initial trauma of displacement and the chronic, lived experience of inhabiting contaminated land and the erasure of communities (Figure 13). Crucially, the respondent frames the continuation of ordinary life and economic activity in such areas not as evidence of recovery but as a phenomenon demanding scrutiny, raising the question of whether normalcy in contaminated areas represents genuine rehabilitation or a performance that masks ongoing harm. This tension between contamination and capitalist continuity is particularly legible in Fukushima, where contrasting temporal experiences and competing narratives emerge between the dominant national discourse, which tends to minimise disaster-related concerns, and the lived perspectives of residents (Figueroa 2018a).

Figure 13. A site in Okuma town where the former housing infrastructure is demolished. It can be classified as "Zones Being Prepared for Lifting of Evacuation Orders" as the decontamination and demolition work is finished. What will be here in the future is open. Photographed in May 2025 by Veera Ojala.

Both areas have engaged in the heritagisation process through the involvement of visitors among other heritage stakeholders, and this dissertation will examine the visual testimonies of visitors to these areas more closely. It is argued in this dissertation that the visual representations of participatory culture contribute to the overall socio-cultural understanding of these areas through the communicative public sphere established through digital image practices (Bareither 2021; Frosh 2001). The negotiation and contestation of the techno-social imaginaries surrounding the relationships between societies, technology, and altered landscapes takes place in dynamic digital public spaces. Through the establishment of a participatory approach and analysis of participant-generated pictures, it is possible to identify the broader socio-cultural significance of co-creation of nuclear memory, and the grammar needed in order to express it.

Having laid the contextual foundation, next, I would like to lead the reader through the theoretical framework of this dissertation research.

2 Nuclear Visual Culture: Combining Dark Tourism Studies with Nuclear Heritage and Visual Studies

Figure 14. The theoretical and conceptual framework utilised in this dissertation.

The purpose of this section is to introduce the theoretical and conceptual framework underpinning this research. Grounded in the theory of critical heritage, the study situates itself at the intersection of dark tourism and dissonant heritage, examining how these frameworks converge empirically in the analysis of nuclear cultural heritage.

2.1 Critical Heritage

Over recent decades, cultural heritage research has undergone a paradigmatic shift driven by global mobility, digital mediation, and cultural hybridity, requiring heritage to be examined as a dynamic process rather than a static category. Critical Heritage Studies (CHS) emerged in the early 21st century in response to these conditions, challenging expert-led heritage practices and foregrounding the socio-political power relations embedded in what societies recognise and value as heritage

(Harrison 2012; Lähdesmäki et al. 2019; Smith 2006). Drawing from memory studies and critical realism, CHS stresses the performative, fluid, and contested nature of heritage as a material-discursive construct shaped by cultural, historical, and political contexts (Skrede 2019; Smith 2021; Waterton 2014). Crucially, as Immonen & Sivula (2025) note, heritage must be recognised as the lived experience and identity work of various stakeholder communities, not merely a collection of artefacts or traditions.

The nuclear past is encountered in the present through ongoing practices of signification and meaning-making, often institutionalised through management plans, protective policies, and the actions of heritage authorities. When a particular interpretation gains recognition within the Authorised Heritage Discourse (AHD), alternative, multivocal, and contested meanings risk being marginalised (Harrison 2012; Kattago 2010; Smith 2006). Heritage also emerges through informal, community-based, and participatory practices, creating productive tension between authorised and unauthorised heritage-making (Smith 2006; 2021). That some counternarratives are acknowledged while others are silenced underscores the inherently political and negotiated nature of heritage praxis (Gentry and Smith 2019; Molden 2015). At both nuclear disaster sites examined in this dissertation, the AHD is not a stable, unified discourse but a deeply ambivalent field in which institutions, corporations, international bodies, survivors, scientists, tour providers, and visitors negotiate what these places mean, who they belong to, and what lessons they may evoke.

Neither Fukushima nor Chornobyl has been officially recognised as a heritage site, but both have been subject to authorised and unauthorised memory practices (Banaszkiewicz 2023; Duda and Jimura 2025). The heritage belongs to various stakeholders, including evacuated residents, those who lost their lives and health due to the accident, tourism promoters, those who administratively manage the sites, and those who visit the area. The memory of Chornobyl in Eastern Europe evolves, becoming more a cultural memory shaped by cultural representations and less a communicative memory derived from contact with witnesses to the events (Banaszkiewicz 2026; 2023). This memory emerges from the interplay between official and vernacular forms of remembrance. On one side stand institutionalised practices such as the annual Chornobyl Disaster Remembrance Day on April 26 and dedicated museums in Kyiv and Slavutych; on the other, a broad spectrum of collective memory expressions that are local, informal, spontaneous, community-rooted, and grounded in tradition, popular culture, and local custom, including music, photography, performance, street art, and various artistic and virtual phenomena (Banaszkiewicz 2026; Marschall 2013).

Prior to the Russian full-scale invasion, the Ukrainian state served as the primary authorising body. The SEZMA regulated physical access, licensed approved tour operators, and structured visits. The pursuit of UNESCO World Heritage status,

actively promoted by Ukrainian officials as a strategy for economic development and national rebranding, would further integrate the CEZ into a global heritage framework that emphasises Outstanding Universal Value (Hryhorczuk 2019). Nevertheless, the Ukrainian government and tour providers have struggled to reach a consensus on Chornobyl's universal value and development plan. Achieving mutual agreement and consolidating Chornobyl's heritage has proven challenging due to persistent corruption and maladministration in managing the Zone (Banaszkiewicz 2023; Hryhorczuk 2019). This lack of agreement regarding the Zone's development has arguably contributed to the continued perception of the area as a nuclear wasteland, rather than as a site for educationally informed visitation.

At Fukushima, the AHD is shaped by an acute conflict of interest: TEPCO, as the operator responsible for the disaster, simultaneously controls physical access to the plant and produces its own institutional heritage narrative through the TEPCO Archives, a facility characterised as presenting a sanitised and selective account designed to cast the utility in the best possible light as collective memory fades (Kingston 2022). Alongside TEPCO, the Japanese government and its Reconstruction Agency actively manage heritage discourse through what they term "hope tourism," reframing disaster as recovery, a strategy criticised for targeting foreign audiences while significant domestic scepticism about safety and accountability persists (Jang et al. 2021; Vainio and Martini 2023). Both the TEPCO Archives and Fukushima Prefecture's Great East Japan Earthquake and Nuclear Disaster Memorial Museum function as competing but institutionally bounded heritage sites, neither of which fully accommodates the counter-discourses of evacuees, activists, and lawsuit plaintiffs who reject the official recovery narrative as premature and self-serving (Kingston 2022; Kojima 2023). These conditions create tension at the site, often expressed as competing narratives that reflect either the dominant national discourse, which seeks to downplay issues related to the disaster, or the counter-narrative as represented by people's views (Figueroa 2018b).

A core concern of CHS is the critique of the AHD, which privileges material, monumental, and expert-defined heritage over lived, intangible, and community-based experience (Hill 2024; Smith 2006). Toxic heritage and nuclear accident sites are particularly resistant to AHD conventions; they are contaminated, hazardous, and demand multi-generational maintenance rather than promotion as positive heritage. Yet for diverse stakeholders, communities affected by contamination, or community-based visitors engaged in non-authoritative heritage practices, such sites acquire meaning through expressions of belonging and embodied, experiential engagement (Article I; Article II; Article III; Article IV). CHS thus serves in this dissertation as an analytical lens that legitimises bottom-up heritage-making by exploring the processes, politics, and practices through which heritage is lived, created, and contested (Kattago 2010). Particular analytical weight is given to creative, transgressive, informal

practices of heritage-making, as the articles demonstrate that these performative acts meaningfully shape site dynamics and the significance ascribed to heritage resources (Article I; Article II; Article III; Article IV). Within the CHS, intangible and emergent heritage practices of the practitioners' communities are recognised as a vital and dynamic component of cultural heritage work (Immonen and Sivula 2025).

Central to this framework is the participatory community and the co-creation of heritage value through engagement (Turner and Tomer 2013). As Harrison (2012, 4) observes, heritage arises from relationships between people, objects, places, and practices, forming "chains of connectivity" between human and non-human actors. CHS also provides an effective lens for analysing emergent and intangible heritage practices, including narratives, experiences, and digital imagery, through which heritage is understood and communicated (Skrede 2020). Drawing on Smith (2021), heritage is approached throughout as dynamic, contested, and socially constructed: a particular way of knowing and understanding the world. In the digital age, visual practices and online sharing increasingly contribute to the co-creation of heritage knowledge, asserting both individual and collective identities (Mutibwa 2016). This notion foregrounds how individuals interact with and attribute meaning to heritage objects, recognising that such agency is socially and discursively mediated (Porcar 2011; Skrede 2020; Smith 2021).

While dark tourism offers valuable insights into visitors' encounters with death, disaster, and memory, a sole focus on the consumption and commodification of trauma overlooks the complexity of heritage-making at nuclear sites (Thomas 2022). As Wight et al. (2025) argue, academic conceptualisations of dark tourism risk creating an epistemic gap between scholarship and practice. In Articles I-IV, I am addressing that gap by employing dark tourism not as a fixed interpretive category but as an analytical lens through which to examine how practitioners and visitors draw on darker historical narratives and cultural disaster imaginaries to construct emotionally resonant engagements and knowledge with nuclear heritage, without imposing preconceptions about visitorial motivation or identity (Wight et al. 2025, 11). The participatory approach adopted here challenges top-down interpretations by foregrounding practitioners' and visitors' perspectives and making transparent the schemas through which disasters are perceived and represented (Horn 2018). This is particularly pertinent in the context of nuclear legacies, where heritage is inherently performative and entangled with contemporary ethical, environmental, and political concerns (Gentry and Smith 2019; Smith 2021; Thomas 2022). Heritage is approached not as a static entity but as a living, negotiated process continually shaped by dialogue, contestation, semiosis, and participation across official and unofficial boundaries. Crucially, the disaster imaginaries at stake are not solely retrospective: they are also prospective, orienting communities, practitioners, and visitors towards unresolved futures of contamination, risk, and nuclear governance.

2.2 Dark Tourism and Dissonant Heritage

Previous research on tourism and heritagisation at nuclear disaster sites has primarily examined the phenomenon through the lens of dark tourism (Goatcher and Brunsden 2011; Martini and Sharma 2022; Stone 2013; Yankovska and Hannam 2013; 2018). As argued above, however, dark tourism risks creating an epistemic gap between scholarship and practice by simplifying heterogeneous practices, imposing external interpretive frames, and feeding normative judgements. In this dissertation, I employ the concept not as a fixed category but as an elaborative and participatory tool situated within a critical heritage framework and participatory ontology (Wight et al. 2025), functioning as a thematic and analytical device to explore how nuclear accident sites are heritagised through narratives, semiotics, and forms of storytelling that shape public memory and collective identity within broader nuclear visual culture. It is therefore essential to provide a brief introduction to the scholarly discussion of dark tourism and related dissonant heritage. As the Articles I, III, and IV argue, nuclear visual culture must be addressed in its own category as a communicative space where the participatory dynamics in the visual context are given due analytical depth.

In the late 1990s, growing scholarly interest in tourism connected to death and disaster gave rise to three closely related concepts: *dark tourism, thanatourism, and dissonant heritage* (Hartmann 2014). Although often used interchangeably, they address different aspects of engagement with difficult pasts. Dark tourism refers to the presentation and consumption of real and commodified death (Foley and Lennon 1996), whilst thanatourism describes travel motivated by a desire to encounter death, whether literally or symbolically (Seaton 1996). Dissonant heritage, by contrast, draws attention to the divergent meanings that heritage sites carry for different social groups, rendering them inherently contested (Tunbridge and Ashworth 1996; Light 2017), a dissonance arising from the understanding that heritage is always a present-day interpretation of the past, shaped by power relations, ideology, and ongoing social negotiation.

Scholars have proposed various subcategories of dark tourism, including dystopian dark tourism (Farkić 2020; Podoshen et al. 2015), toxic tourism (Pezzulo 2007), disaster tourism (Yankovska and Hannam 2013; Robbie 2008), and nuclear tourism (Gusterson 2004; Hryhorczuk 2019). In Japan, the framework for tourism is conceptualised as *hope tourism*, which belongs to the dark tourism category but was developed specifically as a marketing tool for Fukushima's revitalisation (Gerster et al. 2021). Despite this proliferation, no consensus has emerged regarding dark tourism's conceptual boundaries or its relationship to heritage studies (Lennon 2017; Light 2017), prompting critical reflection on how best to theorise such experiences (Thomas 2022; Wight et al. 2025). Light (2017, 277) goes so far as to argue that the

differences between dark tourism, thanatourism, and dissonance heritage tourism are minimal, signalling a growing convergence across these fields.

Dissonance heritage is a particularly valuable concept for this study, as it highlights how heritage embodies tension and multiplicity. Critical heritage provides the means to unpack these tensions and examine the competing narratives and semiotic resources through which heritage is continually negotiated (McDowell 2016; Waterton and Watson 2013). As Tunbridge and Ashworth (1996) argue, conflicting interpretations are not an anomaly but a defining feature of the heritage process itself.

Beyond the materiality of dark tourism sites, the intangible dimensions, representations, narratives, emotions, and ideas are equally vital to understanding how meaning is produced and transmitted (Lennon 2018; Tunbridge and Ashworth 1996). A risk of traditional dark tourism frameworks is their tendency toward one-dimensional, tragic narratives (Barbu Kleitsch and Bader-Jurj 2026). By embedding dark tourism within a critical heritage perspective, this study foregrounds more complex storytelling, encompassing negotiation, contestation, transgression, and co-creation of imaginaries in the visual context (Article I; Article II; Article III; Article IV). A key contribution of this dissertation is the examination of dynamical relationships in heritage creation and the identities expressed within participatory networks, while foregrounding knowledge produced through the active participation of visitors themselves (Article I; Article II; Article III; Article IV).

The two case studies of this dissertation, the Chornobyl and Fukushima nuclear disaster areas, represent emblematic examples of complex heritage landscapes marked by ongoing reinterpretation and negotiation. In Chornobyl, the interplay between abandonment and ecological succession accentuates intangible and emergent aspects of heritage, including atmospheric affect and the construction of place-based meaning (Kempiak et al. 2017). In Fukushima, visitors encounter a contrasting semiotic field shaped by reconstruction and a politics of renewal that reimagines the disaster through forward-looking narratives. Both sites cultivate distinctive sensory atmospheres that reflect their material and discursive character (Grebenar 2018), while the ways visitors move through and engage with them reveal broader negotiations of risk, hope, and public participation.

I therefore employ dark tourism as an elaborative and reflexive device, grounded in the principle that all heritage is inherently dissonant, adding an empirical dimension to how dissonance operates within contested post-disaster sites. As demonstrated across Articles I, II, III, and IV, classifying nuclear accident zones merely as dark tourism destinations is conceptually insufficient: the concept fails to account for the multiplicity of meanings enacted at these sites, the performative assessment of risk, or the semiotic functions of their material and immaterial imaginaries. The subsequent section integrates critical heritage, dark tourism, and

dissonant heritage within the broader orientation of *nuclear cultural heritage*, examining how these frameworks intersect with industrial and toxic heritage paradigms to better capture the material and social entanglements of nuclear heritage-making.

2.3 Nuclear Cultural Heritage

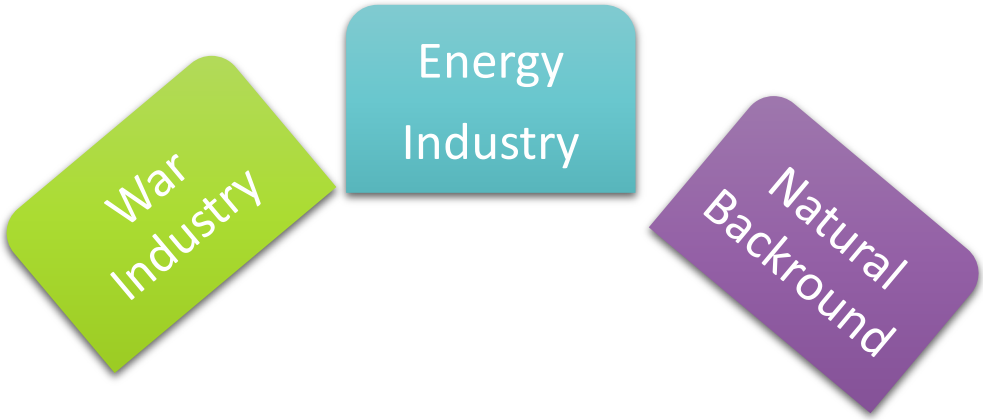


Figure 15. Sources and categories of radioactivity.

Both Chornobyl and Fukushima are in the process of heritagisation and fostering participatory memory cultures (Article I; Article II; Article III; Article IV). Given the enduring impacts of these disasters, it is essential to regard the remaining nuclear disaster sites as heritage places and key case studies in critical and nuclear cultural heritage scholarship. This section applies the concept of critical heritage, drawing on dark tourism and dissonant heritage (Macdonald 2009; Stone 2013; Tunbridge and Ashworth 1996) to examine the co-creation of these sites, merging the conceptual frameworks with the empirical context of the study, illustrating how nuclear cultural heritage exemplifies the intersection of these concepts. Dark tourism's contribution has been to politicise the question of visitation and to foreground the ethics of representing catastrophe (Farmaki and Antoniou 2017); still, more nuanced frameworks must move beyond it. Additionally, I explore the connections between nuclear cultural heritage and two related heritage concepts: industrial heritage and toxic heritage.

The heritagisation of nuclear power dates to the 1950s, when debates on the museumification of atomic energy emerged at the Geneva Conference on the Peaceful Uses of Atomic Energy in 1955 (Schmidt 2006), marking the beginning of a broader recognition of nuclear technology, its achievements and complex legacy

alike, as cultural heritage worthy of preservation. Since then, nuclear themes have grown increasingly prominent in heritage studies, particularly in connection with decommissioning and the reassessment of the recent atomic past (Ross 2023). Nuclear activities have historically spanned three interrelated domains: the military, the energy industry, and the natural environment as a background radiation context. This dissertation focuses primarily on the remnants of the nuclear energy industry, whilst acknowledging the compound civilian and military dimensions of atomic use, including the ties between uranium enrichment at the Chornobyl Nuclear Power Plant (CNPP) and weapons production (Decamous 2018; Wendland 2020).

The nuclear energy industry's heritage encompasses the material, symbolic, and emotional legacies of nuclear technology and its associated disasters, including contaminated sites such as Chornobyl and Fukushima, abandoned infrastructures, memorials, and evolving cultural narratives around the atomic past (Edberg and Strom 2025; Ross 2023; Storm et al. 2019). Dark tourism entered nuclear heritage studies largely through disaster sites (Stone 2013; Hannam and Yankovska 2013, Duda and Jimura 2025), drawing attention to the commodification of disaster and the tension between mourning and spectacle. However, as argued in Articles I, II, III, and IV, this explanatory reach is limited in the nuclear context, as nuclear sites resist such stable categories and straightforward interpretations. Shaped by the long-term and often invisible nature of radioactive danger, this legacy must be understood as simultaneously technological, industrial, and cultural (Rindzevičiūtė 2019). The inherent ambivalence is commonly recognised across two registers: the celebratory, encompassing national scientific achievements from early experiments and atomic weapons testing to nuclear energy development; and the catastrophic, encompassing the effects of nuclear bombings, major accidents, and nuclear colonialism (Storm et al. 2019).

Nuclear heritage is marked by multiple forms of *narrative dissonance,* tensions between technological optimism and environmental devastation, between progress and trauma, between pride and contamination. As Hecht (2012) argues, nuclear imaginaries oscillate between exceptionalism and banality, a duality that poses challenges to dark tourism's empirical assumptions concerning the legible landscape of suffering. Nuclear tourism thus embodies an ambivalent blend of utopian and dystopian understandings of the atomic past (Storm et al. 2019, 126). Unlike other forms of industrial heritage, nuclear remains are further distinguished by a visible–invisible paradox (Dovydaitytė 2021). Nuclear contamination is largely invisible, diffuse, and open-ended. What visitors encounter at these sites is not the aftermath, but an ongoing unresolved condition. The decommissioning and preservation of these sites raise complex questions about hazardous material legacies, whilst the broader history of nuclear testing and accidents has simultaneously generated global anxiety and a vibrant nuclear popular culture, both as responses to and mediations of perceived existential threat (Horn 2018).

2.3.1 Industrial Heritage

Nuclear cultural heritage is closely related to two other heritage categories: *industrial heritage* and *toxic heritage.* As a form of industrial heritage, it reflects the technological, social, and architectural dimensions of the nuclear industry, encompassing sites such as power plants, archives, and landscapes (Ross 2023). Industrial heritage more broadly captures transformations in production and labour, preserving sites that trace societal change and modernisation. Its overlap with dissonant heritage becomes evident when industrial legacies evoke discomfort or contestation. The CEZ, with its abandoned city of Pripyat, deserted villages, and reactor complex, exemplifies the entanglement of industrial and dissonant heritage (Storm 2014; Banaszkiewicz 2023). As Storm (2014) observes, such post-industrial landscapes are marks of sorrow, abused power, and latent hazard, yet simultaneously preserve stories of community, achievement, and resistance, bearing witness to trauma and injustice, but equally to endurance, progress, and hope.

The construction of the CNPP marked a milestone in Soviet technological ambition, its RBMK reactors generating electricity whilst simultaneously producing uranium for weapons, a dual function reflecting Cold War priorities (Brown 2019; Wendland 2020). Pripyat, known as Atomgrad or "Atom City", was purpose-built for plant workers and their families, housing between 30,000 and 80,000 residents (Higginbotham 2019; Wendland 2020), and embodied the ideals of socialist modernity and rational planning characteristic of the era (Wendland 2020; Yaroshinskaya 2011). Today, its ruins exemplify dissonant industrial heritage, where nostalgia, fear, and the sublime coalesce into sensory experiences that unsettle linear narratives of progress and decline (Martini et al. 2025; Peeples 2011). Across the Articles, I employ dissonance as a productive analytical lens to account for the dynamic processes of interpretation and meaning-making at nuclear heritage sites (Article I, Article II; Article III; Article IV), foregrounding the contested, negotiated, and politically charged nature of nuclear memory and its material afterlives.

The industrial and atomic history of the Fukushima prefecture becomes easily overlooked, particularly with the current demolition and transformation activities taking place at the site, which also erases the memory of the nuclear community. The Fukushima area has historically been a residential community centred around the Daiichi nuclear power plant and what is known as the "Nuclear Village" in Japan (Kingston 2012; Schreurs 2021; Taniguchi 2022). The term refers to a network of experts and advocates who promote nuclear power, including utility companies, nuclear retailers, bureaucrats, government officials, the financial sector, media, and academia (Taniguchi 2022). This term serves as a convenient way to describe a powerful interest group with a specific agenda, which has effectively and profitably advanced its interests since the 1950s (McCormack 2011). Residents living near the plant were deeply embedded in and shaped by these industrial networks, their daily

lives reflecting the social and economic dependencies that the nuclear industry cultivated. This history matters for the present research because it complicates any straightforward narrative of recovery or renewal: understanding what is being rebuilt at Fukushima requires understanding what existed before, and whose memories and livelihoods are at stake in the ongoing transformation of the site.

2.3.2 Toxic Heritage

Closely related to NCH is the concept of *toxic heritage*, which refers to sites, practices, or artefacts associated with harmful environmental, health, or social legacies arising from industrial, military, or technological activity (Wollentz et al. 2020). As Kryder-Reid and May (2023, 1) note, toxic heritage encompasses both the material history of toxins and how these histories intersect with formal heritage institutions and informal memory practices. It exposes the tensions between preservation and destruction and between remembering and erasing. Toxic heritage and nuclear cultural heritage overlap significantly, both addressing legacies of contamination and the cultural, historical, and ethical questions the entanglements raise (Harrison 2021). Both demand intergenerational maintenance, carrying connotations of visibility and invisibility, care and danger.

For countless people, Chornobyl and the 3.11 Triple disaster remain open wounds. Radioactive materials from Chornobyl's reactor no. 4 will require management for an estimated 20,000 years (Hryhorczuk, 2019). Current efforts focus on decommissioning the RBMK reactors, while in Fukushima, the dismantling of Daiichi's damaged units remains technically unresolved (Bass 2026). Clean-up operations, such as the redistribution of contaminated soil across Japanese prefectures, exemplify the ongoing negotiation of toxicity, justice, and risk. Living within such landscapes raises pressing questions about sustainability, equity, and the ethics of coexisting with contamination. These sites, while hazardous, serve as enduring reminders of humanity's entanglement with its technological creations and toxicants. While these sites carry risks, they also serve as powerful reminders of the need for sustainable practices, fair development, and critical engagement with our industrial and technological past, which addresses questions concerning exposure to these substances (Decamous 2018).

Although nuclear power plants share physical similarities with other industrial structures, large, fenced assemblages of infrastructures and towering chimneys, what distinguishes nuclear heritage is its engagement with *deep time* and *intergenerational responsibility,* issues that are rarely confronted in industrial and toxic heritage on such a scale (Harrison 2020; Holtorf and Högberg 2020; Wollentz et al. 2020). Toxic heritage may involve hazardous materials, but not with the same invisibility, longevity, or complexity. Unlike most industrial sites, the legacies of

radioactivity force society to think in geological temporalities (Holtorf and Högberg 2020; Ialenti 2020). Thus, nuclear cultural heritage presents a unique paradox: while the physical structures of nuclear facilities may eventually be dismantled, the radioactive materials associated with them cannot be eliminated. As Anna Storm (2020, 339) notes:

> *"However, radioactive remains are not easily rendered invisible and trigger both technical and existential debate. As a human legacy, or heritage, these remains force humanity to conceptualise responsibilities of care into distant futures, but this act of imagination, that is, to safely manage this toxic residue for such long-time horizons, is certainly very difficult."*

Thus, while *industrial, toxic,* and *nuclear heritage* intersect, nuclear heritage stands apart for its temporal, symbolic, and cognitive dimensions and complexity. The inherent tension in nuclear technology arises from its paradox: technological progress versus the potential for its destruction to humankind (O'Brian 2015). The dual meanings, symbols of technological advancement, and existential threats are attached to nuclear sites and imaginaries, such as Cold War narratives, science fiction, and public memories of disasters such as Chornobyl and Fukushima. These elements are less central in toxic and industrial heritage. Still, the toxic sublime elicits responses such as self-evaluation, deliberation, and irrationality from the transformed landscapes, responses that would not typically arise in unaltered settings (Peeples 2011). NCH can therefore be viewed as an inclusive framework that encompasses industrial and toxic heritages while also accounting for the cultural, symbolic, and temporal complexities of the atomic age. As demonstrated across the Articles I, II, III, and IV, NCH resists reduction to a single interpretive framework, and vernacular visuality offers a novel access point into its empirical domain.

This section has examined dark tourism, dissonant heritage, and the interrelated concepts of industrial and toxic heritage within the empirical domain of NCH, demonstrating both their intersections and divergences. Dark tourism occupies an important but transitional place in nuclear heritage studies, generative enough to have opened the field, but insufficiently complex to expand the discussion, as argued in Articles I, II, III, and IV. NCH is distinctive for its temporal scale, symbolic depth, and global cultural resonance, its imaginaries embodying the paradox of nuclear modernity: progress overshadowed by the possibility of extinction, a tension that has long animated nuclear art and photography (Dovydaitytė 2021; 2022b; Marila 2024; Marila and Andreoletti 2025). The participatory and visual turn extends this knowledge further, attending to how visitors actively co-create nuclear heritage through photography, social media, and collective imaginaries (Article I; Article III; Article IV).

These performative practices constitute not only efforts to negotiate the meaning of nuclear accidents but wider acts of participation in assessing and representing risk in the nuclear age. The following section introduces the additional concepts central to this study: nuclear visual culture, participatory culture, and performative heritage-making.

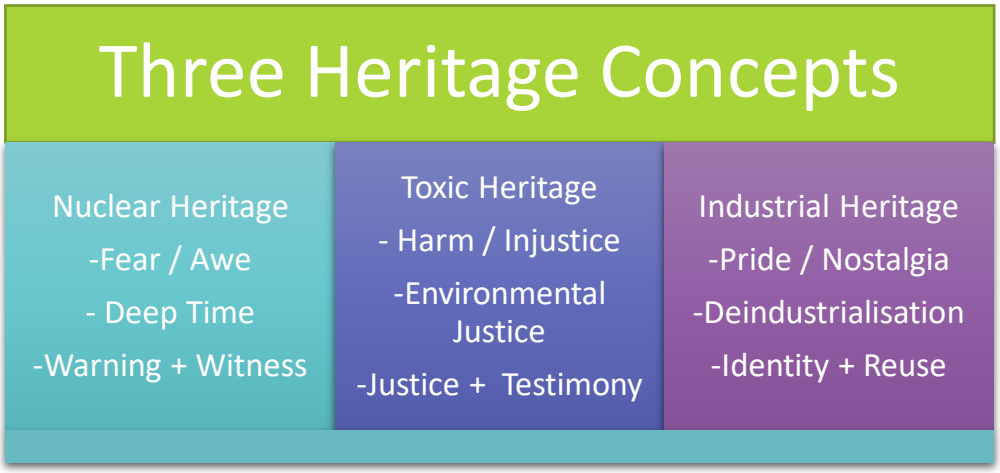


Figure 16. The interfaces of the three heritage concepts used in this research.

2.4 Nuclear Visual Culture and Heritage Studies

Since its inception, nuclear technology has been rooted in the historical and cultural contexts of the societies that developed and used it, and the relationship between industry, government, and the public has changed significantly (Josephson et al. 2021, 27). From the Manhattan Project to the Cold War and beyond, atomic culture has made a lasting impact on society, shaping historical narratives, architectural landscapes, and collective memory. In these cycles of cultural production, heritage studies increasingly recognise nuclear sites, artifacts, and cultural representations as crucial for understanding the technological, political, and environmental legacies of the nuclear age (Mbah et al. 2025; Rindzevičiūtė 2019). Therefore, examining the cultural expressions and social meanings related to atomic energy is essential.

Sites such as uranium mines, nuclear bomb production facilities, atomic testing grounds, fallout shelters, accident zones, and nuclear waste repositories profoundly influence the cultural narratives of atomic culture (Krupar 2020; Pitkanen and Farish 2018). The physical manifestations of the nuclear industry remain deeply connected to the Manhattan Project and the Los Alamos testing sites in New Mexico, which culminated in the United States' use of atomic bombs on Hiroshima and Nagasaki.

Later accidents at nuclear power plants, Three Mile Island in the United States, Chornobyl in Soviet Ukraine, and Fukushima in Japan, have become enduring cultural representations of fear, hope, and uncertainty, expressed not only through official discourse and media but also within broader popular culture (Weart 2012; Zeman and Amundson 2004).

Atomic culture is inherently dual and includes diverse representations of nuclear themes across traditional and popular media, encompassing both institutionalised, authority-driven, and everyday cultural practices (Corner et al. 1990; Crilley 2025). As Fiske (2011) argues, popular culture is produced industrially yet continually reshaped by those who consume and reinterpret it, and atomic culture operates as precisely such a social system of signification, one in which hopes and fears surrounding nuclear technology find collective expression. With the dawn of the nuclear age, long-standing apocalyptic imaginaries were elevated to unprecedented levels: humanity became aware of its own capacity for self-destruction and the option that there might be no future at all (Horn 2018, 47), and, as Sontag (1965) observes, was forced to live under the shadow of both individual death and potential collective extinction. The end of the world is one of mankind's most ancient fantasies, and it finds new expressions in the atomic imaginaries which question modernity's faith in progress and human ability to shape its fate (Horn 2018). This paradox of nuclear power as simultaneously a force of progress and a harbinger of annihilation has rendered any statement about nuclear events inherently unstable (Derrida 1981) and helps explain the enduring symbolic power of nuclear themes in public consciousness (Pískatá 2025).

The imaginaries of atomic events are fundamentally visual, a recognition that necessitates analysing *nuclear visual culture* as a distinct, if deeply interconnected, dimension of broader atomic culture. Atomic culture has profoundly shaped popular culture and its associated visual representations, from Cold War films such as *Dr. Strangelove* (1964) and *Godzilla* (1954) to contemporary video games like *Fallout* and *Call of Duty,* each expressing nuclear fascination, fear, and dystopian imaginaries of otherwise inaccessible spaces (Foucault 1984; Stone 2013). Literature, comics, and music have similarly absorbed atomic imagery, reflecting the anxieties and ideological tensions of their respective moments (Masco 2006). Collectively, these cultural artefacts function as repositories of memory and semiotic interpretation, mediating collective imaginaries of nuclear technology and catastrophes, and it is precisely this visual dimension that this dissertation places at the centre of its analysis.

Nuclear visual culture is central to how atomic culture produces and circulates meaning. The images it generates, photographs, films, and visual art, are not merely conveyors of meaning but, as Mitchell (2005) argues, animated agents with their own desires and demands. Certain nuclear tropes, such as the mushroom cloud or the

gas mask, crystallise these dynamics, becoming culturally saturated symbols that shape collective understandings of risk, threat, and the atomic condition (Decamous 2018; Upham et al. 2020).

Nuclear heritage and photography share an intrinsic history; photographic images have been instrumental in shaping the uses and meanings of nuclear technology (O'Brian 2015). Nuclear explosions demanded specialised camera techniques, which in turn influenced the development of camera technology and served as primary sources of scientific data. The purposes of photography in the context of nuclear technology have since proliferated. Photography has been utilised for various purposes, including photojournalism, documentation, propaganda, artistic expression, and tourism, among others (Decamous 2018; Fields 2020; O' Brian 2015; Volkmar 2022). Photography as cultural representation is crucial in such discussions, as certain depictions, views, images, and symbols shape and regulate how nuclear heritage is perceived, valued, and understood by various constituents, making them a lens through which wider cultural and social tensions can be examined (Immonen 2023; Waterton and Watson 2010).

Within heritage studies, photography is frequently examined in relation to evolving philosophies of representation, technological advancements, and cultural practices (Sterling 2020). Nuclear photography has played a significant role in public and governmental documentation, influencing public perceptions and policy decisions, mediating techno-human relationships, serving as material evidence, providing a medium for storytelling, and humanising the atomic era (Carpenter 2016; Schuppli 2020; Volkmar 2022). Photography has become central to mediating, preserving, and contesting the imaginaries and visual frameworks associated with nuclear imagery (O'Brian 2015). Beyond its function in public memory, photography has enabled nuanced understandings of nuclear energy as both beneficial and harmful, as a symbol of scientific rationality and as a representation of the incomprehensibility of its destructive potential, while also contributing to its mythologisation. In this context, visual media function as active textual sites where semiotics plays a critical role in shaping certain social and cultural narratives over others (Waterton and Watson 2010).

The landscapes of Chornobyl and Fukushima are particularly significant for examining the imaginative and interpretive processes that constitute nuclear visual culture. The Zone (Figure 17) stands as one of the most complex examples of nuclear cultural heritage, an authentic, contaminated space where multiple and competing narratives converge (Ross, 2023), whilst Fukushima presents a contrasting semiotic field, where the memory of catastrophe sits in tension with the visible restoration of everyday life (Article IV). Both sites are layered with ambivalent meanings shaped over decades through media and visual representation, and their relative accessibility

makes them productive case studies for examining how publics actively participate in the co-creation of nuclear visual culture.

These sites and digital participatory culture (Giaccardi 2012; Jenkins et al. 2009) provide an additional means of accessing the visuality of nuclear heritage by recontextualising its meanings and facilitating symbolic production. This framing underscores the need to understand heritage as a communicative act of meaning-making in the present, recognising it as more than simply a collection of objects, extending this recognition to all communities engaged in identity work through the past (Immonen and Sivula 2025; Sivula 2022; Smith 2015). The visual practices of participatory culture are understood here as actors, not merely reflections, within the wider dynamics of heritage-making.

Atomic culture's defining characteristic, as this section has shown, is its entanglement with nuclear visual culture: the possibility of participating in that visual culture informs the meaning-making of digital participatory culture and the heritage position through which agency and knowledge are constituted. It is precisely this interaction, most visible in visitors' photography, that makes nuclear visual culture meaningful to analyse as a distinct system of signification and communication irreducible to, yet sharing and overlapping with other forms of industrial cultural representation.

Figure 17. Chornobyl 2, Duga Radar system maintenance facilities. Photographed in October 2019 by Veera Ojala.

2.4.1 Imaging Altered Landscapes

The Chornobyl disaster occupies a prominent place in visual representations of the atomic age, functioning as a symbol of global catastrophe and the imagined destruction of human civilisation, a layered cultural metaphor, acting as a laboratory of images (Hundorova 2019). These narratives and imaginaries have been mobilised through the materiality of the Zone, where the decaying infrastructure forwards complex interpretations of memory (Figure 18). Unlike Fukushima, where narrative tension emerges between catastrophe and visible reconstruction, Chornobyl's landscape is saturated with competing and often irreconcilable discourses, portraying the site alternately as a medical and economic catastrophe, an instance of governmental failure, a cautionary tale for humanity, and an ecological recovery narrative (Hutchings and Linden 2018, 209–210). As Stone (2013), drawing on Hetherington (1997), observes, Chornobyl functions simultaneously as a monument to Cold War secrecy, a warning against nuclear utopianism, and a site of surreal counter-hegemonic spatial representation. Fukushima, by contrast, has yet to accumulate a comparable density of popular cultural references; its visual culture is still shaped more by the politics of recovery than by mythologisation, making the comparison between the two sites analytically productive for understanding how nuclear visual cultures form under different conditions.

The multivocal nature of Chornobyl's imagery has been further enriched through biblical motifs and literary references, notably the Strugatsky brothers' *Roadside Picnic* (1972) and Tarkovsky's *Stalker* (1979), which embedded the site within mythological and philosophical frameworks. These cultural works have permeated popular media, from *Call of Duty* to *S.T.A.L.K.E.R.*, producing a layered matrix of remembrance, representation, and imagination tied to the Zone. Such narratives are continually reconstructed within heritage sites, where intangible resources, imaginaries, and narrative itself become the primary objects of engagement (Chronis 2012; Chronis et al. 2012). As Hundorova (2019) indicates, in modern culture, nuclear accidents turn from historical events into cultural constructions, becoming not only real but virtual phenomena; Chornobyl, in particular, transcends regional tragedy to become a global cultural event, raising questions of post-apocalyptic survival whose meanings extend far beyond the physical site.

This expansive cultural resonance has shaped how the Zone is experienced on the ground. The site has been co-created through the "experience of verbal and embodied negation of what is safe and secure" (Storm and Fröhlig 2025, 26), involving formal and informal spatial exploration influenced by both official and unofficial tourism practices, where risk and danger are either accepted or contested.

Whilst access to the Zone became practically feasible in 2002 and officially opened to tourists in 2011, unofficial or "illegal" tourism had flourished since the mid-1990s (Banaszkiewicz 2022), driven initially by popular culture and later by urban exploration subcultures (Edensor 2005; Garrett 2015; Matila et al. 2025), with each establishing recognisable visual discourses of transgression and escapism (Article I; Article II). Between 2017 and 2019, these practices became increasingly commodified, proliferating across social media, YouTube, and various fictional and nonfictional publications (Kamysh 2023; Richter 2020; Stepanets 2017). As Banaszkiewicz (2022, 87) notes, legal and illegal tourism are best understood as a spectrum of behaviours that inspire each other, a dynamic this dissertation builds upon in Articles I and II by emphasising how spaces of contested heritage are continuously renegotiated through participatory visitation, contributing to new experiential and interpretive textures at the site.

The intersection of official and unofficial visitation, spatial practices, and photographic participation has been a defining element in shaping visual heritage outcomes in the CEZ (Article I; Article II; Article III) and, in a different register, in Fukushima, where hope tourism and state-sanctioned narratives of recovery shape a contrasting but equally contested visual field (Article IV). Examining these intersections across both sites is essential for understanding how societies construct and reinterpret collective memories of the nuclear age, and how sites of disaster become enduring arenas for negotiating identity, belonging, loss, and the human relationship with technological catastrophes.

Figure 18. Yaniv train station in the CEZ. Photograph taken in October 2019 by Veera Ojala.

2.5 From Nuclear Object to Cultural Object

This section finalises the argument developed so far, locating nuclear heritage within the domain of nuclear visual culture, enabled by altered landscapes, and elaborating on how vernacular co-creation takes place through engagement, performativity, and semiotics. The two case studies examined in this dissertation, the Chornobyl and Fukushima disasters, have, through their visual presence and significance, become constitutive elements of shared nuclear disaster heritage. In modern culture, nuclear accidents transform from historical events into cultural constructions, becoming not only real but virtual phenomena (Hundorova 2019, 31), and it is through this process of cultural transformation that co-creation becomes both possible and necessary.

Central to understanding these co-creative processes is a *performative shift* in heritage studies, which repositions visitors not as passive recipients but as active co-creators of meaning (Ek et al. 2008; Franklin 2003; Smith 2015). As a theoretical lens, performativity offers an embodied perspective on the interplay between social structures and individual agency (Smith 2021), foregrounding visitor participation as constitutive of nuclear heritage itself. Performativity is inherently connected to semiotics (Waterton and Watson 2014): visitors do not simply encounter meaning at nuclear sites but actively produce it through interpretation, navigation, and image-making. At nuclear heritage sites, visitors are shaped by intertextual references, myths of place, and visitation choices, yet simultaneously exercise agency by interpreting and navigating sites individually. Nuclear sites function as semiotic landscapes, spaces inscribed with meaning through human intervention and performative visitor practice (Akdağ 2026; Jaworski and Thurlow 2011), and the production of such landscapes requires systems of signification whose semiotic signs are generated through encounter and experience (Lindström et al. 2018; Stroud and Jegels 2014). Meaning at these sites is never fixed but continuously negotiated through the interests, socio-cultural inheritance, and awareness that visitors bring to the act of image-making (Kress and van Leeuwen 2021).

If the site constitutes the semiotic field, it is the visitor's embodied presence that activates it. As Urry and Larsen (2011, 178) note, amateur photographers are also amateur semioticians, drawing on the semiotic resources available within their visual culture. The images they produce, evoking nostalgia, fear, awe, and hope, render nuclear cultural heritage emotionally resonant and culturally meaningful, extending engagement with the site across digital platforms. Photography should therefore be reconceptualised, as Bærenholdt et al. (2004, 254) argue, as a medium of world-making: an embodied performance occurring in the ambivalent space between gazes and images, technological capabilities, and expressive bodies that encounter places multisensorially. Vernacular image-making is central to this process (Article I; Article III; Article IV) yet is frequently overlooked in the context of nuclear heritage.

Digital participatory culture (Giaccardi 2012; Jenkins et al. 2009) extends the interpretation of NCH further, providing additional means of accessing the visuality of nuclear heritage by recontextualising its meanings and facilitating symbolic production (Zhukova 2016). The role of digital devices and social media illustrates how heritage extends into extra-discursive realms (Thouki and Skrede 2025) on platforms such as Flickr, Facebook, and Instagram, characterised by fluidity and participation, where visitors' photographs and digital practices create new image environments that extend beyond the physical site. These practices reflect performative actions such as staging, exploring, and framing, and constitute unauthorised, context-dependent curatorship strategies through which heritage value and cultural significance are continuously negotiated (Giaccardi 2012).

Such participatory practices function simultaneously as acts of memory and transmission. Through rhetorical storytelling, material-discursive heritage practices, encompassing imaginative frameworks, performances, and embodied experiences at the sites (Smith 2021, 25), participants articulate and circulate nuclear disaster meanings. The visual and experiential dimensions of these practices thus support both the communication and remembrance of nuclear disaster sites, while also enabling an examination of how subjective experience relates to semiotic anchors, a relationship that remains dynamic and continuously evolving (Hilmar 2015, 458).

Photography condenses experiences that resist verbalisation, keeping nuclear risk alive as a feature of reflexive modernity (Butler et al. 2025). Yet rather than operating outside discourse, photographic practice actively shapes it: images constitute a form of collective imaginary through which the conditions and workings of nuclear culture become legible (Horn 2018), demonstrating that photographs work as cultural media. Participatory culture thus contributes to the discursive space that frames the words and images used to describe nuclear territories, extending and transforming the meanings attached to these sites (Storm 2020).

Nearly four decades after the explosion at Chornobyl's Reactor 4, the memory of the disaster is increasingly mediated through cultural institutions such as media, museums, and sites of memory (Gerster and Maly 2022, 193). At this generational distance, collective memory can no longer rely solely on direct experience; it depends on the cultural practices through which people express their attitudes and relationships to the past (Bell 2012, 4). Yet heritage is continually redefined through the present negotiation of values linked to stories, places, and events (Storm 2014, 5), and visitors actively participate in this process independently of institutional authority (Molnár et al. 2023). In doing so, they take responsibility for the curation of sites such as the CEZ and Fukushima, actively shaping narratives and imaginaries of post-disaster spaces and extending the interpretive horizons attached to them.

Visuality serves as both a metaphor for and a medium of the social and cultural construction of the past (Watson 2010). The past, in this sense, is always a

constructed vision, shaped by power dynamics, cultural contexts, and available modes of representation (Becker and Frosh 2015). Participatory photographic culture, as a system of signification and a form of social visuality (Giaccardi 2012), makes this construction visible and contestable. Social visuality offers a method for distinguishing the value attributed to various heritage objects within specific cultural contexts, while digital photography functions as a medium of emergent heritage, bridging tangible and intangible dimensions and influencing how both are perceived and managed. The scopic regimes established at heritage sites shape the selection, framing, and representation of objects, places, and monuments (Waterton and Watson 2010), while bottom-up participatory practices simultaneously challenge and expand these regimes, redistributing authority over what is worth seeing and remembering.

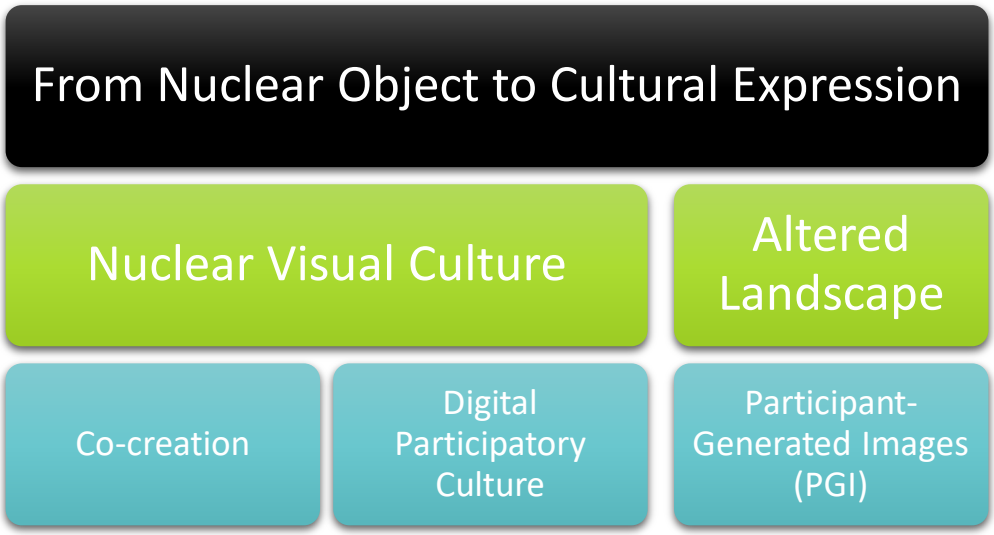


Figure 19. The conceptual and theoretical framework of this dissertation.

Through sharing, photographs evolve from personal keepsakes into forms of social communication, turning collectives into active publics rather than passive archives. Through these image practices, nuclear objects acquire their significance as cultural symbols. The conceptual and theoretical framework for co-creation presented in Figure 19, combining heritage and visual studies, participatory culture, performativity, and participant-generated imagery, reflects this understanding, providing the analytical scaffolding through which Articles I, II, III, and IV examine how nuclear sites are transformed from technological artefacts into cultural symbols. The crucial analytical intersection lies at the experience, semiotic elements, and

photography, examining the co-creation of nuclear imagery to reveal how these practices shape collective narratives and public consciousness. Visual culture is not merely reflective but productive; images do not represent social realities so much as participate in constituting them (Larsen 2006; Rose 2023). Visuality, therefore, functions as both a metaphor for the social construction of the past and an active force in shaping it, with nuclear photography producing the very cultural meanings it appears only to record.

In the following section, I will present the methodology and the empirical domain of this dissertation research.

Figure 20. Bicycles in Namie city, at the town hall. Photograph taken in May 2025 by Veera Ojala.

3 Research Design: Establishing a Participatory Approach

This section outlines the research design, methodological choices, and selection of case studies, as well as the rationale behind the chosen research tools. It begins with a discussion on the ontological and epistemological foundations of the study and their influence on the overall approach, including the adoption of a case study methodology that integrates ethnographic and netnographic methods and explains how the research field was accessed.

Subsequently, the section provides an overview of the data sources used to construct a comprehensive understanding of the research topic, including expert interviews, qualitative interviews with visitors to the CEZ and Fukushima, participant-generated images (PGI), and photo-elicitation as an interview method. The study employs a mixed-methods design, combining quantitative and qualitative approaches in an explanatory and interpretive manner (Creswell and Plano 2018; Sandelowski 2000).

Following this, the data analysis procedures are introduced, including the coding processes, narrative analysis, and socio-semiotic analyses, and the development of thematic structures across the Articles I, II, III, and IV. The chapter focuses on the core methodological framework which underpins the dissertation, while recognising that each article includes its own methodological discussion, elaborated further in Section Four. The chapter concludes with reflections on source criticism and ethical considerations, highlighting the principles that guided data collection and interpretation throughout the research process.

3.1 Ontological and Epistemological Foundations

The ontology of this dissertation is grounded in phenomenological philosophy, as reflected in the research questions presented in the Introduction Section, which address the co-creation of heritage through participatory practices. Phenomenology, as the foundational philosophical stance, emphasises the narratives individuals craft through their engagement with heritage (Jackson et al. 2019). At its core, phenomenology forms an interpretive epistemological framework acknowledging that human actions should be analysed from the perspective of the actor's own

subjective viewpoint (Bryman 2016, 26–27). Phenomenological research aims to understand how people interpret and assign meaning to their experiences, focusing on sensations, emotions, and personal significance rather than adhering to a singular, positivist reality (Frechette et al. 2020).

In phenomenological research, the initial step is the recognition that a phenomenon must be understood through lived experience to uncover its meaning (Dodgson 2023; Englander 2012). This is reflected not only in the general methodological orientation of the dissertation but also in its core research aims and questions. The research explores how visitors imaginatively construct and articulate the CEZ and Fukushima, and these constructions are inherently rooted in personal experience. Consequently, they must be examined through methods that reflect the subjective and experiential nature of this engagement. Phenomenology acknowledges that interview questions tend to elicit deeply subjective responses, drawing on participants' thoughts, emotions, and imaginative reflections, all embedded within layered and personal experiential contexts (Gupta and Zieske 2024; Husserl 1977).

Figure 21. Pripyat in autumn. Photograph taken in October 2019 by Veera Ojala.

The qualitative interviews and participant-generated photographs (PGI) presented in this section provide key access points to the knowledge this study seeks to generate. Accordingly, alongside phenomenology, an interpretivist epistemology informs the analysis and understanding of knowledge production (Kadyschuk 2023). The interpretation of data is derived from examining the meanings, symbols, semiotics, and narratives embedded in the semi-structured interviews and visual materials. Interpretivism as an epistemological stance maintains that knowledge is subjective and context-dependent, shaped through the interaction between researcher and participant (Acharya 2024).

By conceptualising experience as subjective, multivocal, and polysemous, a phenomenological approach facilitates research outcomes that reflect the heterogeneity of experiential interpretations, their interrelations, and the emergent meanings generated within each site.

3.2 Case Study Selection

As the aim of the study is to elaborate on vernacular nuclear heritage-making, two nuclear disaster sites, the CEZ and Fukushima triple disaster area, stand out due to their scale and imprint in collective memory. To investigate visitors' practices of co-creation at these sites, this study adopts a case study approach. This methodology is particularly suitable for developing a comprehensive, contextually grounded understanding of how meanings of heritage are constructed from a grassroots perspective. The case study approach is characterised by its focus on contemporary contexts and settings (Ebneyamini and Sadeghi Moghadam 2018; Yin 2014), enabling a detailed exploration of visitors' imaginative and performative practices at the CEZ and Fukushima.

Following Creswell and Poth (2023), the study defines its parameters as follows: the specific sites (the CEZ and Fukushima disaster area), the participatory approach (visitors and members of participatory culture), and the temporal scope of data collection (September 2019 —May 2025). The purpose of case study research is to generate an in-depth, theory-informed understanding of a specific context, using multiple sources of data interpreted through the researcher's analytical framework (Bryman 2016). Fieldwork was integral to this approach; direct site visits, expert interviews with key stakeholders, and spatial observations within both areas enabled me to develop the contextual grounding necessary for interpreting subsequent data. This embodied familiarity with the sites informed the design and conduct of the online data collection phase, which encompassed semi-structured interviews alongside photographs captured by visitors during their visits. Rather than treating these as separate stages, the study understands fieldwork and online data collection as methodologically continuous, each enriching the analytical depth of the other. The integration of multiple data sources in this way represents a well-recognised strength of case study methodology (Bryman 2016; Creswell and Poth 2023; Smith 2018).

3.3 Layers of Research: Ethnography and Netnography

During the research, two ethnographic practices enriched the data collection: the visits to the actual sites and monitoring the social media platforms and visitors' image practices. Fieldwork began with two months in Ukraine (September —

October 2019) and continued with two weeks in Fukushima (May 2025). My visit to Ukraine was supervised by Mohyla Academy in Kyiv, which provided an invaluable academic base for the research. Being part of a local scholarly community offered access to essential local knowledge, networks, and expertise relevant to the topic of this dissertation.

The primary aim of the fieldwork was to develop a comprehensive understanding of the research context, in alignment with the principles of case study methodology (Bryman 2016; Creswell and Poth 2023). To this end, I employed a combination of methods designed to enable a detailed and nuanced exploration of the case (Bryman 2016, 61). The geographical proximity afforded by fieldwork enabled direct access to the Zone, where I participated in two guided tours organised by different companies. Each tour presented distinct levels of structure and engagement, both in relation to the guides, the space itself, and among visitors. During these visits, I closely observed the design of the tours, the reactions of participants, and the performative behaviours enacted through bodily movements, spatial practices, and photographic activities.

Participation in these tours and the broader fieldwork in Ukraine offered critical insights into both organised and informal visitation patterns within the CEZ. This understanding was further enriched through expert interviews with diverse stakeholders, including journalists, photographers, and legal as well as illicit tour operators. The familiarisation process required attentiveness to multiple perspectives and interpretive frameworks surrounding the Zone. Through field excursions, spatial observations, and stakeholder consultations, I cultivated a nuanced, multi-layered understanding of the research context, which subsequently informed interviews with the primary research cohort, visitors to the Zone.

In May 2025, I conducted two weeks of fieldwork in the Fukushima area. This phase was complemented by an academic visit to Tohoku University's International Research Institute of Disaster Science (IRIDeS), where I presented my research and exchanged insights with scholars studying the Fukushima region. In Fukushima Prefecture, I engaged with diverse stakeholders, including former evacuees, tour providers, artists, citizen scientists, members of NGO's, researchers, and municipal officials. I participated in two guided tours, visited the Fukushima Daiichi Nuclear Power Plant, the Interim Storage Facility for decontaminated soil, and conducted site visits to several museums, including the Tomioka Archives and the Great East Japan Earthquake and Nuclear Disaster Museum. Additionally, I visited various Denshokans (commemoration sites) and conducted spatial and photographic documentation in the towns of Iitate, Tomioka, Yonomori, Okuma, Futaba, Namie, and Odaka. Figures 20 and 22 were taken in one of these excursions with a person who, with multiple artists, established a museum Oreden in Odaka, as a counter-narrative to the authorised discourse of recovery and normalisation.

Figure 22. An abandoned elementary school is waiting to be demolished in Namie, Fukushima. Photographed taken in May 2025 by Veera Ojala.

Familiarisation with these varied sites, activities, and actors provided a comprehensive perspective on the dynamics of recovery, particularly concerning the tensions between institutionalised memory, expressed through official commemorative frameworks, and grassroots narratives that circulate informally (Figueroa 2018a; Kawasaki 2023). Both fieldwork periods deepened my understanding of spatial, cultural, and commemorative actors and processes in the two disaster areas, thereby heightening the interpretive sensitivity applied to the data analysis.

In parallel with the fieldwork, I also employed netnography (Kozinetz 2015; Tavakoli and Wijesinghe 2019), an adaptation of ethnographic methodology to the study of online cultures and communities. In practice, this involved systematic observation of key social media platforms, Facebook, Instagram, and Flickr, to examine photographic meaning-making within digital environments. In the context of this study, the emphasis was placed on digital image practices, specifically taking pictures, uploading, and sharing them on online platforms (Bareither 2021). The applied context offers valuable insights into how visual elements shape experiences and expectations and work as rhetorical acts (Article I; Article III; Article IV). Netnography enabled the exploration of how images function as cultural texts that bridge the online and offline layers of experiences, shaping expectations, values, meanings, and interpretations of nuclear heritage, creating a contingent communicative space (Sluis, 2023; Thouki and Skrede 2025).

Observing digital image practices reveals how visual representations shape public perceptions of nuclear disaster areas and contribute to participatory heritage-

making (García-Esparza and Nikšič 2024). In addition, heritage interpreted through digital images allows the investigation of these given resources and how they are used as communicative acts (Ojala forthcoming). In this study, digital image circulation is understood as a liminal practice, one that operates between the material and the symbolic, mediating the transformation of heritage meanings within broader systems of signification. These meanings are fundamentally shaped by the relationships that individuals, communities, societies, and nations cultivate with their perceived cultural heritages, and it is precisely these relationships that define photographic practices, their meanings, and their uses (Pasternak 2021).

Contextual research in Ukraine and Japan informed the development of a participatory approach, as the recruitment of interviewees was conducted via various social media platforms between October 2019 and January 2025. The monitoring of Facebook, Flickr, and Instagram enabled the identification of individuals who had visited the sites, after they had uploaded images. Participants were contacted via private messages, through which I introduced the study and invited voluntary participation, allowing individuals to exercise agency over their involvement. Most had visited the sites within the preceding few months, enabling reflection with some temporal distance. I sent private messages equally to both genders, but the interview requests were accepted more often by males. This gender imbalance is reflected in Section 3.7 Source Critical Reflections.

A key difference shaping later analysis was the marked imbalance in digital commemoration between the two sites. Chornobyl's memory culture is visually dominant on social media: groups such as "Chornobyl Exclusion Zone Through Stalkers' Eyes" exceed 60,000 members and remain highly active even four years into Russia's full-scale invasion of Ukraine. Fukushima has no equivalent dedicated community, with related imagery scattered across platforms. This asymmetry confirms that no participatory visual heritage discourse has emerged around Fukushima, pointing to significant differences in the digital ecology of nuclear memory. It also raises broader questions about cultural responses to these sites and the conditions under which photographic co-creation becomes possible, since social media platforms function as arenas where heritage norms are negotiated and contested (van Dijck 2013, 19).

3.4 Data Characteristics and Qualitative Interviews

In this section, I describe the characteristics of the interview data collected as part of the ethnographic and netnographic components of this research. As the focus of this dissertation lies in exploring individual meaning-making processes, an elaborative and reciprocal dialogue with participants was considered the most appropriate approach for this interpretive inquiry. A semi-structured interview format was

chosen because, while it follows a set of predefined themes, it also allows participants to speak freely and descriptively, enabling the emergence of themes that are meaningful to them (Kallio et al. 2016). Such flexibility allows the researcher to pose pertinent follow-up questions and delve more deeply into participants' lived experiences (Michrina and Richards 1996).

Qualitative interviews are particularly suited to capturing participants' perspectives on experiences, attitudes, values, and social processes (Wolgemuth et al. 2014). As explained in the previous section, participants were recruited through various social media commemoration-based platforms between September 2019 and January 2025, generating three distinct sets of interview data. The interviews comprised open-ended questions addressing participants' motivations for visiting the CEZ and Fukushima, site engagement, tour selections, on-site experiences, and photographic practices. Rather than a rigid protocol, the interview guide served as a flexible framework shaping discussion while remaining open to evolving meanings and emerging themes (Kallio et al. 2016).

Interviews were conducted via Skype and Zoom and, with participants' consent, were transcribed and translated verbatim into English. I explained the aim of the research and how the data will be analysed and subsequently recorded respondents' agreement to participate in the research. I use pseudonyms throughout the Articles I, II, III, and IV in order to protect the interviewees' anonymity. Most interviews were conducted in English, with three conducted in Finnish. The combination of ethnographic and netnographic methods enabled a transnational research perspective, resulting in 75 qualitative interviews with participants from 22 countries. This approach produced a dataset that was diverse in terms of visitor backgrounds, motivations, and site experiences. The material reveals how digital participatory culture generates distinct practices and meanings, shaped by the performative nature of image-sharing and storytelling. These communicative acts, produced by and circulated on online visitor platforms, point to the co-creation of agency, as participants collectively negotiate and construct the significance of nuclear disaster sites through their digital engagement.

Table 4 (Ojala, 2020) depicts the interview data used in Articles I and II, which was collected between September 2019 and January 2020; forty in-depth interviews were conducted, each lasting between 30 and 90 minutes. The data enabled the identification of distinct visitors' heritage positions within the tour choice categories. The themes that emerged were further refined during data analysis to align with the research questions and illuminated the distinct characteristics of visitor categories, group, private, and unofficial, and their specific relationships to the material resources of the CEZ.

Table 4. Demographics of the interview respondents in Articles I and II.

Subject	Sex	Age	Origin	Type of Tour*	Year of visit**	Number of visits	Occupation
Respondent 1	M	46	Sweden	Unofficial	2017	4	B
Respondent 2	M	22	UK	Unofficial	2019	1	CE
Respondent 3	M	46	Denmark	Private	2019	1	NS
Respondent 4	F	33	UK	Group	2016	1	P
Respondent 5	M	25	Belgium	Group	2019	1	B
Respondent 6	F	31	Ukraine	Unofficial	2016	5	P
Respondent 7	M	52	UK	Private	2018	2	P
Respondent 8	M	33	UK	Unofficial	2019	1	P
Respondent 9	M	31	Italy	Group	2019	1	P
Respondent 10	M	53	UK	Private	2016	3	CE
Respondent 11	M	29	Belgium	Unofficial	2019	1	CE
Respondent 12	M	34	Belgium	Private	2019	1	P
Respondent 13	M	28	Germany	Private	2019	1	P
Respondent 14	M	34	UK	Private	2019	1	CE
Respondent 15	F	43	UK	Group	2019	1	CE
Respondent 16	M	44	Austria	Private	2017	2	P
Respondent 17	M	34	France	Unofficial	2019	2	CE
Respondent 18	F	38	Poland	Private	2018	3	P
Respondent 19	M	45	France	Private	2014	7	P
Respondent 20	M	42	Australia	Group	2016	1	P
Respondent 21	M	44	Belgium	Private	2017	2	CE
Respondent 22	M	49	UK	Group	2016	2	CE
Respondent 23	M	59	USA	Private	2019	1	NS
Respondent 24	M	25	Norway	Private	2019	1	CE
Respondent 25	M	44	Germany	Group	2019	1	NS
Respondent 26	M	38	Germany	Private	2012	10	CE
Respondent 27	M	42	Belgium	Private	2019	1	CE
Respondent 28	M	32	Germany	Group	2019	1	P
Respondent 29	M	52	Australia	Private	2019	1	CE
Respondent 30	M	26	USA	Private	2019	1	S
Respondent 31	M	29	UK	Private	2013	4	CE
Respondent 32	M	37	Germany	Private	2019	1	NS
Respondent 33	M	43	Portugal	Unofficial	2019	1	NS
Respondent 34	F	38	Finland	Group	2019	1	P
Respondent 35	M	21	Sweden	Group	2019	1	S
Respondent 36	M	44	UK	Private	2019	1	CE
Respondent 37	F	30	NL	Private	2019	1	P

Subject	Sex	Age	Origin	Type of Tour*	Year of visit**	Number of visits	Occupation
Respondent 38	M	32	Finland	Group	2019	1	CE
Respondent 39	M	38	Czech	Group	2019	1	CE
Respondent 40	M	40	Poland	Private	2012	2	P

*) If a respondent had visited the Exclusion Zone with several types of tours, the category equals the one that the respondent preferred.
**) If a respondent had visited the Exclusion Zone more than once, the category equals the year of the first visit.
M= Male, F= Female, B= Businessperson, CE= Company Employee, NS= National Service, P= Professional, S= Student
Source: Ojala, 2020

Table 5 presents the data used in Article III. The Article explores temporal changes in experiential and photographic meaning-making across three time points: 2008, 2013, and 2018. The data set was collected between June 2023 and January 2024 from members of the Flickr social media community. A total of 18 semi-structured interviews were conducted, each lasting between 30 and 120 minutes, and these form the empirical basis for Article III.

Table 5. Demographics of the interview respondents in Article III.

R*	V*	N*	G*	R*	V*	N*	G*	R*	V*	N*	G*
1	2018	Germany	Male	**7**	2013	France	Male	**14**	2008	UK	Female
2	2018	Netherlands	Female	**8**	2013	UK	Male	**15**	2008	UK	Male
3	2018	USA	Male	**9**	2013	France	Female	**16**	2008	Germany	Male
4	2018	UK	Male	**10**	2013	Belgium	Male	**17**	2008	Portugal	Male
5	2018	Netherlands	Male	**11**	2013	UK	Male	**18**	2008	Russia	Male
6	2018	Sweden	Male	**12**	2013	Sweden	Male				
				13	2013	Ukraine	Male				

* R= Respondent, V= Visitation year, N= Nationality G= Gender

In analysing the interview data, attention was directed toward how tours have evolved, how representational technologies have developed, and how participants engage with and describe their practices within digital visual culture. The interview transcripts also helped to clarify and contextualise the initial qualitative content sample (Table 10). These findings were examined through a social-semiotic analytical framework (Kress and van Leeuwen 2021; Rose 2023; Vannini 2007), and a thorough analysis will follow in Section Four.

Table 6 presents the characteristics of the interview data in Article IV. The third data set was collected between August 2024 and January 2025 and consists of 17 semi-structured qualitative interviews, each lasting between 30 and 120 minutes. As noted earlier, the visual heritage community surrounding the commemoration of Fukushima is geographically and digitally dispersed. Consequently, respondents were recruited from several social media platforms, including Flickr, Facebook, and primarily Instagram.

Table 6. Demographics of the interview respondents in Article IV.

Respondent	Gender	Origin	Category	Site	Visit
Respondent 1	Male	Finland	Visitor	CEZ/Fukushima	2017/2020
Respondent 2	Male	USA	Expert	Fukushima	2011-2020**
Respondent 3	Male	USA	Expert	Fukushima	2011-2023**
Respondent 4	Male	Australia	Visitor, artist*	CEZ/Fukushima	2019/2013
Respondent 5	Female	Netherlands	Artist	Fukushima	2015-2019**
Respondent 6	Male	Germany	Visitor	CEZ/Fukushima	2018/2023
Respondent 7	Female	Netherlands	Visitor	CEZ/Fukushima	2018/2024
Respondent 8	Male	UK	Visitor, expert*	CEZ/Fukushima	2019/2019
Respondent 9	Male	France	Visitor	Fukushima	2021
Respondent 10	Male	Ireland	Visitor, expert*	Fukushima	2016-2019**
Respondent 11	Male	Germany	Artist	Fukushima	2015-2023**
Respondent 12	Male	Australia	Visitor, artist*	CEZ/Fukushima	2018/2013
Respondent 13	Male	USA	Expert	Fukushima	2013-2024**
Respondent 14	Male	Canada	Artist	Fukushima	2015 & 2020
Respondent 15	Male	Japan	Expert	Fukushima	2011-2024**
Respondent 16	Female	Netherlands	Artist	Fukushima	2017
Respondent 17	Male	France	Expert	Fukushima	2011-2016**

*When a visitor is placed in two categories, it means that the interviewee has two overlapping visitation roles.
** When the visitation year category is marked by "- ", it means that the interviewee returned multiple times to the site over the years.

To locate relevant visual material and potential interviewees, I searched each platform for keywords related to the Fukushima area to identify photographs taken at the site. As with the previous datasets, the respondents were sent an interview request based on uploaded and shared visual content. The temporal data collection enabled nuanced knowledge to emerge concerning the sites as experiences and photographic imaginations, and a further analysis of how the imaginative, photographic horizons of both sites have evolved.

3.5 Visual Methods: PGI and Photo-Elicitation

In addition to in-depth interviews, the research incorporated participant-generated images (PGI) and photo-elicitation methods (Berry et al. 2025; Rose 2023). Photo-elicitation introduces photographs into interviews to prompt reflection and discussion, "based on the simple idea of inserting a photograph into a research interview" (Harper 2012, 156). While its benefits are well established, having participants contribute their own images remains less common, requiring careful negotiation over use and copyright (Balomenou and Garrod 2016). Its advantages include richer contextual understanding and deeper emotional engagement, as visuals can convey complex experiences more effectively than words alone (Gomez 2024).

PGI enables participants to express their viewpoints visually and contribute directly to the co-construction of research material, deepening engagement and strengthening the study's participatory dimension (Drew and Guillemin 2014). This methodological development emerged organically in 2019, when one interviewee proposed exchanging photographs after an interview, an initiative that enriched dialogue by prompting mutual reflection on each other's visual material. The exchange illustrates a central strength of PGI and photo-elicitation: participants' images acted as prompts for deeper discussion, surfacing site-specific narratives and imaginaries and capturing nuances that might otherwise remain unarticulated (Cleland and MacLeod 2021; Harper 2012; Rose 2023).

This research thus extends the methodological scope of nuclear heritage studies by foregrounding visual meaning-making within participatory communities and the public sphere established through these communicative spaces on social media. Given the symbolic and visual dimensions of nuclear accident sites, photography offers a productive means to explore how visual practices shape and mediate heritage.

Participants were invited to submit three to four photographs taken during visits to the CEZ or Fukushima, representing their perceptions of these places. In the first visual dataset used for Article I, 37 of the 40 research participants supplemented their interviews with photographs from their visits to the Zone. For Article III, all 18 participants contributed images, while in Article IV, 15 of the 17 interviewees did so. The PGI datasets collected through three samples consisted of n=120 in Article I, n=72 in Article III, and n=75 in Article IV. Interviewees' consent to use their pictures in the research was recorded, and written agreements were made with the participants whose pictures were published in the articles. These photographs were analysed with the interplay of transcribed interview data. Pictures are not just objects to be decoded; instead, their capacity to attract, haunt, and insert even magical power was examined through the aura, desire, and imaginaries attributed to images (Mitchell 2005; 2022). As the respondents themselves selected the photographs, they represent personal visual narratives that must be treated as data in their own right.

The emerging knowledge retrieved through the combination of PGI and photo-elicitation data was also triangulated in the subsequent interviews to strengthen the validity and reliability of the findings (Bryman 2016). Table 7 summarises the methods and analytical frameworks used in the research Articles.

Table 7. Condensation of the methodological framework.

Methods	Article I	Article II	Article III	Article IV
Ethnography	x	x		x
Netnography	x	x	x	x
Interviews	x	x	x	x
Pgi	x		x	x
Photo-elicitation	x		x	x
Content analysis			x	
Narrative analysis	x	x		
Socio-semiotics			x	x

3.6 Data Analysis

Data analysis transforms raw material into meaningful insights, fulfilling the research objectives of this dissertation. The primary data presented in Articles I and II, comprising semi-structured interviews and participants' photographs, were examined using narrative analysis. This method was selected because it effectively captures both intrapersonal and interpersonal experiences, allowing for an in-depth understanding of lived realities through storytelling (Saldaña 2016). As Bryman (2016, 590) notes, narrative analysis focuses on "the stories that people employ to account for events," aligning closely with the overarching research question of Article I: "*In what ways do various visitor groups engage with Chornobyl's heritage through narratives and visual representations?"* Narrative analysis thus provided a means of unpacking the details within participants' accounts (Grbich 2013, 216), enabling the identification of narrative patterns, expressions, and meanings, which were later organized into discourses and sub-themes.

The narrative analysis generated a thematic structure (Figure 23), supported by iterative coding of both interview transcripts and visual materials. Each dataset was first analysed separately and then comparatively examined to explore the relationships between textual and visual narratives. This approach was particularly suitable for identifying the complementary roles of photographs and interviews in the co-construction of meaning (Harper 2012; Rose 2023). The analysis revealed three overarching narrative types — or what I call tales — through which visitors articulated their relationship to the exclusion zone: *The Tale of Mighty Nature, The*

Tale of Apocalyptic Afterness, and The Tale of the Mythical Zone. These findings are discussed in detail in Section 4.1.

Article II also employed narrative analysis to address the question: "*How do visitors' spatial strategies perform and communicate the inherited significance of the Chornobyl Exclusion Zone?"* Building upon the thematic structure developed in Article I, the analysis focused on the spatial enactments of visitors' experiences. Data was organised and coded in the Atlas.ti software tool, and analysed through the lens of visitors' narratives of the spatial practices. Following Mura and Sharif (2016), narrative analysis assumes that people's stories are key lenses through which social reality can be explored. The approach was well-suited for studying the heritagescape of the CEZ in 2019, as it investigates "the social phenomena that activate, produce, organise, and transmit stories" (Mura and Sharif 2016, 195). By examining how individuals construct and represent events, it became possible to trace how narratives are situated within the broader socio-cultural context of the Zone.

First, I identified the performative dispositions associated with different tour categories — *spectator, explorer, and adventurer* — as decoded from the transcripts. These dispositions corresponded with varying levels of engagement with the materiality of the Zone. Second, I linked each disposition to specific spatial strategies — *conformity, enactment, and contestation* — which reflected visitors' practices and interactions within the heritagescape. The perception of radiation risks was also considered, as it added a further dimension to how space and contested heritage were interpreted. The Results Section 4.2 presents these practices and their dynamic inter-relationships within the CEZ's performative landscape (Table 9 and Figure 27).

While Articles I and II explored the production of space through performativity and storytelling, Articles III and IV applied socio-semiotic approaches to investigate how landscapes are co-created through experiences, semiotics, discourses, and meaning-making. The dataset for Article III employed a mixed-methods design, combining a quantitative sample of photographs retrieved from Flickr with a qualitative set of participant-generated images (PGI). The aim was to answer the research question: "*What visual distinctions can be observed in visitors' photographs of the Chornobyl nuclear disaster Zone from 2008, 2013, and 2018, and how have these representations temporally evolved?"*

The temporal analysis identified shifting representational patterns and changing relationships between materiality, embodiment, and digital mediation. In the first quantitative phase, a semiotic approach was used to measure the frequency and composition of specific visual elements, such as content, size, and framing, revealing patterns in representational practices (Table 10) (Dicks 2013; Philipps et al. 2017; van Leeuwen 2005). These findings were further interpreted through the qualitative phase, examining the practices and meanings behind these representational shifts. Analytical concepts from social semiotics, including discourse, semiotic function,

change, and modality, guided the comparative generalisation process (Bell 2004; Kress and van Leeuwen 2021; Vannini 2007). The interview data illuminated how representational elements and meanings emerged through participants' technological affordances, semiotic engagement, and prior visual knowledge. Table 11 in Section 4.3 summarises these semiotic resources, their shifting meanings, and their interpretative functions, followed by a discussion in the respective section.

Article IV continued the socio-semiotic line of inquiry, analysing communication patterns in the photographic meaning-making of visitors to both the CEZ and Fukushima. It addressed the research question: "*In what ways do the visual narratives of the Chornobyl and Fukushima disaster sites diverge concerning post-nuclear imaginaries?"* The analysis identified different representational visual contexts by analysing images taken by visitors at both sites and how they contribute to the discursive construction of place and the use of a space as a semiotic resource in its own right (Jaworski and Thurlow 2011).

Socio-semiotic inquiry operates through three interrelated dimensions: discourse, experience, and socio-cultural context (Vannini 2007). These analytical tools demonstrated how landscapes are evoked through photography and how the co-creation of visual heritage discourse shapes cultural imaginaries. The analysis of interview data further revealed how participants explored the sites, adopted representational technologies, and developed expressive practices as participants in digital visual culture. The results produced a thematic structure (Table 12) representing the visual heritage configurations at both sites. The identified image practices at these two sites contribute to the organisation of broader socio-technological imaginaries in post-radioactive sites, and these findings will be presented in Section 4.4.

Detailed analytical tables are presented in the results section, where they elaborate on and support the contributions of each Article. The respondents' photographs are further used in an evocative photo-essay style (Rose 2023) accompanying the text to emphasise arguments and provide a narrative window into each visitor category.

3.7 Source Critical Reflections

The data collected for this dissertation span several years, providing both temporal and transnational depth to the study of participatory and nuclear visual cultures. While the methodological framework is robust in its integration of multiple qualitative approaches, the datasets would benefit from a closer examination of sample size and demographic composition, particularly regarding the predominance of male participants. In each of the interview datasets, men are notably overrepresented, raising potential concerns about gender bias that must be

acknowledged and addressed. While recruiting interviewees on social media, I sent private messages to both possible female and male participants. The interview requests were more often accepted by males, which contributed to the gender imbalance of the Articles I, II, III, and IV. Ideally, I would have wanted to recruit a balanced ratio. As the pattern followed in each of the studies, the imbalance might reflect the broader gender distribution typical of the activities under investigation.

Nuclear tourism, urban exploration, and photography predominantly attract male practitioners, the typical urban explorer being a middle-aged white male, a demographic pattern that itself warrants further investigation. The collected data can therefore be considered representative of these practitioner communities. Among female participants, no substantial differences emerged in motivations, narratives of experiences, photographic practices, or visual representations, nor did age yield any clear distinctions. The typical visual tropes of abandoned toys and children's cribs were popular photographic motifs also among male interviewees, and females were also exploring the Zone through illegal visits. Still, the vernacular nuclear visual culture along the line of gender distribution could be investigated more closely in the future, as a balanced sample could potentially indicate nuanced insights into the activity of photographing and representational choices.

A further methodological consideration concerns the use of English across most interviews. While the majority of participants were proficient English speakers, some occasionally struggled to find precise vocabulary to fully articulate their thoughts and experiences. This may have limited the depth and nuance of certain responses. However, the photographs served as a compensatory tool in these instances, allowing participants to gesture toward or describe visual details when verbal expression proved insufficient. Throughout the interviews, I employed double-checking to verify my understanding of ambiguous or unclear responses in order to enhance the accuracy and integrity of the data collected.

Another limitation concerns the scope of generalisation: while the Articles I, II, III, and IV offer detailed and context-specific findings, their transferability to other nuclear sites may remain limited without further comparative research. Finally, although this dissertation addressed the ethical dimensions of representing trauma and trespassing, these themes warrant more extensive consideration, particularly in relation to digitalisation and the commodification of heritage. The broader power dynamics concerning access to these communicative networks would be a fruitful path to follow. Future research could expand on these ethical and socio-cultural implications to further situate nuclear visual culture within broader debates on memory, media, escapism, and transgression. In addition, future studies could benefit from an intersectional approach to data collection and analysis. Such an approach would enable a deeper exploration of how gender, class, and cultural background shape engagement with nuclear heritage, risk perception, and visual representation.

3.8 Ethical Considerations

The investigation of the traumatic landscapes of Chornobyl and Fukushima raises a range of ethical considerations. The chosen methodology, centred on participant-generated photography and ethnographic approaches, requires careful reflection on how trauma, memory, and representation are addressed in heritage research. Throughout this study, I have sought to balance the need to understand the documentation and interpretation of these spaces with the imperative to avoid aestheticising or commodifying trauma. Navigating between the analysis of participatory visual culture and the imperative of social justice has been a delicate process, particularly when examining practices of visual consumption that might appear ethically ambiguous.

The concept of ruin porn and dark tourism attaches negative attributes to the visitation activities on the sites of trauma and abandoned sites (Bentley 2018; Stone 2013). This dissertation argues that such concepts oversimplify complex socio-cultural phenomena. By framing vernacular photography purely as an act of voracious consumption, they fail to account for the deeper motivations and socio-cultural drives that underpin these practices. This is not to dismiss the fact that the data collected reflects certain structural dynamics, including unequal access to digital networks of communication and the Western-dominated character of the transnational heritage-practitioner community under study. Nevertheless, this research approaches such practices as meaningful cultural responses to nuclear disasters. While some may argue that investigating them risks marginalising the experiences of survivors and directly affected communities, this thesis contends that acts of visual engagement and imagination are crucial for understanding how societies collectively process and reframe catastrophic events.

As I employed participatory approaches, the use of participant-generated imagery (PGI) raises important questions about informed consent and the photographer's agency. Ethical visual research must ensure transparency regarding how materials are collected, interpreted, and presented. Following Pink (2021), this research considers not only the production of images but also their circulation, reception, and interpretative framing. The use of photographs and their presentation to audiences was carefully negotiated with participants to honour their perspectives and intentions. Findings were shared with participants on an ongoing basis, and the role of their images within the evolving study, along with the significance of those images, was communicated to them regularly.

As Smith (2006) notes, heritage is not merely a collection of objects, but an ongoing process of meaning-making that is inherently political. Nuclear heritage sites embody contested narratives between official state discourses, survivor testimonies, global media representations, and the enframings of public visual heritage discourse (Decamous 2018). Engaging with these tensions ethically requires

recognising multiple voices and the broader representational dynamics at play, and what types of representational possibilities this visual phenomenon might enclose. Thus, the principles of polyvocality and inclusivity have guided this research throughout. The local heritage stakeholders' view has also been acknowledged through the expert interviews and fieldworks. By focusing on transnational visual heritage communities, the study seeks to valorise diverse cultural responses to nuclear disasters and to examine why certain narratives gain greater prominence within global memory cultures.

The repurposing of nuclear sites as tourist destinations raises pressing ethical questions about commodification, voyeurism, and the trivialisation of suffering. Critically examining how and why these spaces are visually represented and co-created through the lens of visual literacy and reflexivity is therefore essential. The ethical considerations arising from this study and the steps taken to ensure adherence to best research practices are summarised in Table 8.

Table 8. Ethical concerns and the actions taken to cover them.

Ethical Concern	Description	Action
Representation of trauma and suffering	Balancing documentation with sensitivity to avoid aestheticising or commodifying trauma.	Understanding the visual strategies from the participants' perspective.
Informed consent and digital ethics	Ensuring transparency and respect for participant agency in the use of publicly shared digital content.	Written or recorded oral agreement with the research participants.
Navigating contested and dissonant narratives	Acknowledging multiple voices and avoiding privileging dominant narratives in heritage interpretation.	Robust data analysis and triangulation
Heritage tourism and commodification	Critically examining the ethical implications of tourism and the commodification of nuclear sites.	Reflexive research practice was utilised through the study to ensure scientific reliability.
Visual ethics and symbolic power	Interpreting images with awareness of their cultural and emotional impact on public memory.	Critical visual literacy practices
Intergenerational responsibility, environmental harm, and deep time in the context of nuclear semiotics	Considering long-term ethical responsibilities in preserving and communicating nuclear heritage.	Attaching the results to the discussion of public participation in the performative work of aestheticisation, risk, and recovery through nuclear semiotics.

This methodological chapter has guided the reader through the development of a participatory research approach, grounded in the epistemological and ontological foundations of interpretivism. It outlined the shared methodological framework across the Articles I, II, III, and IV, beginning with the case study design and extending through the layers of ethnography and netnography, as well as the collection of qualitative interviews and participant-generated photographs. The key characteristics of the data analysis were also discussed, followed by a consideration of source criticism and ethical concerns. In the next section, I present the results of the data analysis in the four research articles that constitute this dissertation.

4 Findings: The Co-Creation Work of the Participants of Nuclear Visual Culture

In this section, I will present and summarise the results of four articles of this dissertation research. They are listed in chronological order, corresponding to their submission and publication dates.

4.1 Chernobyl Dreams: Investigating Visitors' Storytelling in the Chernobyl Exclusion Zone

The first research Article I answered the first partial research question: "*1) In what ways do different visitor groups perform Chornobyl's heritage through narrative and visual representation?*"

Focusing on the diverse stories and imaginaries of the Zone, the Article I explores how its rich narrative template emerges through the interplay of imagination and materiality, combining elements of fantasy and reality. Central to this analysis is the multiple narrative composition: Zone's resonance with dystopian and utopian imaginaries, its deep cultural connotations with *Roadside Picnic* (1972) and Tarkovsky's *Stalker* (1979), particularly formative in former Soviet countries, and its embeddedness in broader societal formations of nuclear imaginaries. These imaginaries are permeated by the negotiation of risk alongside narrative framings that enable various visions of hope, loss, resilience, and recovery (Storm 2018; Strom and Fröhlig 2025). Visitors to the CEZ do not simply encounter a contaminated landscape; they actively negotiate what the Zone means as a site of danger, memory, and possibility.

Performative encounters and experiences at the site translate into photographs, which in turn shape what counts as heritage in the public's gaze. Yet, these encounters are not merely about passively receiving and gazing. The Article I broadens the scope of heritage site visitation and photographing by considering photographs to be vital and vibrant; they allow the onlooker to delve into the heterogeneous narratives they contain and frame the visitor as an exploring agent who, through their encounters, becomes entangled with the surroundings (Lund

2023). I argue that these encounters translated to collective imaginaries constitute cultural responses to nuclear catastrophe and represent a form of broad public participation, one enacted through photography and performative practice that renders the Zone's landscapes both legible and affectively charged.

The analysis identifies three dominant storytelling patterns within visitor narratives (Figure 23): *The Tale of Mighty Nature, The Tale of Apocalyptic Afterness, and The Tale of the Mythical Zone*. Together, these narrative forms reveal a fluid and multifaceted understanding of the Zone's cultural significance, illustrating how visitors' encounters with the landscape and reappropriations of existing articulations contribute to the ongoing construction of Chornobyl's heritage. Each storytelling pattern corresponds to a distinct visitor profile and tour format — *group, private, and unofficial* — and to a specific performative identity position: *spectator, adventurer, and explorer*. Crucially, each position also entails a different relationship to risk: from the managed safety of guided spectatorship to the deliberate transgression of unofficial exploration.

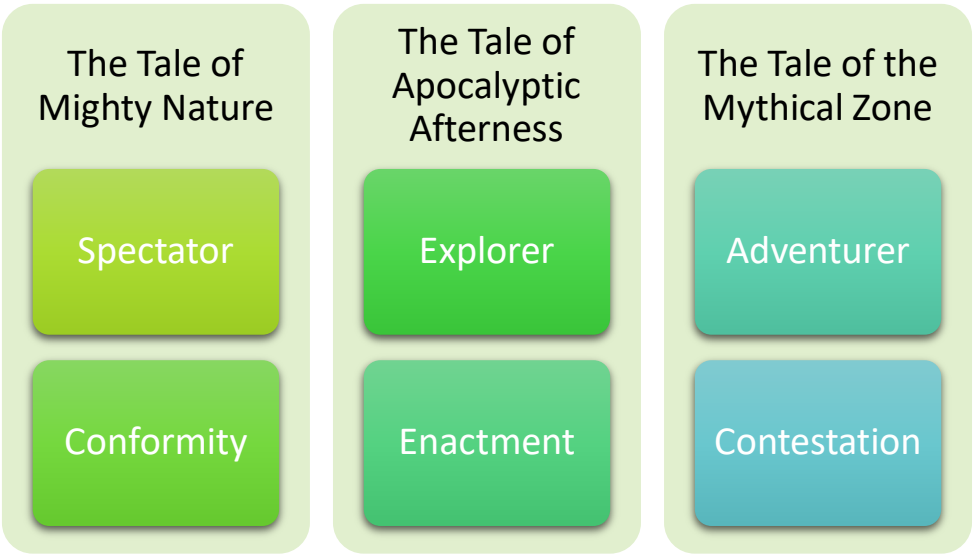


Figure 23. Thematic structure of the narrative analysis.

Categories describe practices and goals of action, shaped by factors such as available time, risk assessment, and the need for personal interpretation; they are not evaluative judgments about the authenticity of an action or its ontological closeness to the object. This tour-based segmentation introduces a novel analytical perspective, revealing how different modes of performative engagement shape both the negotiation of risk and the production of meaning within the Zone. This typology

also alleviates the notion that photography is constituted by social relations that the surrounding landscape partly directs and stages (Lund 2023).

Figure 24. Pripyat Ferris Wheel photographed in 2019. Source: Nicolas Guisset, reproduced with the author's permission.

The Tale of Mighty Nature emerged predominantly among spectators on organised group tours, whose photographic storytelling centred on ecological recovery and resilience, nature's reclamation of the built environment. Figure 24 illustrates this through the amusement park in Pripyat and its iconic Ferris Wheel: a deserted cityscape that contrasts sharply with the controlled, regulated urban spaces of contemporary life. Confined largely to exterior surfaces within the Zone, group tour visitors attuned themselves to nature's spatial transformation of the area. Familiar elements, the Ferris Wheel, horizons swallowed by overgrown vegetation, became sites of extraordinary sensory encounter, evoking nature's conquest over civilisation and technology. As one respondent described:

> *"I would say the city of Pripyat was indescribable. It is impressive to see such a young city abandoned. The town was not founded until 1970, so it was only 16 years old before the accident. It was impressive to see such a big city completely abandoned and to see how life continues even after such a terrible disaster."*
>
> — Respondent 5

As both the preceding account and the photographs demonstrate, the gradually vanishing outlines of decaying infrastructure evoked emotional responses in visitors, signifying not only loss but also a powerful testament to nature's boundless capacity for renewal. Even in the aftermath of the most catastrophic nuclear disaster, life endures. It is this deeply held conviction, articulated through both words and images, that co-creates *the Tale of Mighty Nature.*

The second storytelling format emerged from respondents who visited the Zone on private tours. Unlike group tour participants, these visitors were less satisfied with regulated tourist patterns and sought greater spatial freedom and personal engagement with the site. They actively avoided crowds and well-visited tourist spots, pursuing a more autonomous and self-directed encounter with the Zone. This spatial practice, oriented toward personal meaning-making rather than collective and mediated experience, defines their position as *explorers*.

Figure 25. The Pripyat barber shop photographed in 2019. Source: Darmarworld, reproduced with the author's permission.

A pronounced and anticipated encounter among the *explorers* was with the insides of the buildings. Due to this type of visitor's choreography, respondents construed the story of the Zone through its attributes of absence and multi-sensory encounters:

> *"The place is abandoned for the most part, with 50,000 people, so being there with a big group, you miss the soul of this place. You miss being inside a building because the 10 of you can't go inside the buildings and just sit there and listen to the wood creak from the window outside. You miss that if you are in a big, noisy, loud group."*
>
> — Respondent 14

Figure 25, taken inside a Pripyat barbershop, illustrates the kind of multisensory experience private tour visitors actively sought. The room bears clear signs of decay and abandonment, chipped plaster, paint peeling from the walls, the floor strewn with debris and empty bottles, yet it is bathed in warm sunlight filtering through the window. The image captures the particular quality of connection these respondents pursued: a sensitivity to the Zone's atmospheric conditions, its play of light, its sounds, and silences.

Beyond this sensory engagement with the contradictions of ruination, respondents also reconstructed the Zone's narratives through encounters with the artefacts found inside its buildings. The ruins of Pripyat, and the CEZ more broadly, have been shaped as much by systematic looting as by natural decay (Dobraszczyk 2010, 381), and visitors themselves may rearrange what remains. Yet it is precisely the emotive charge of these objects, their indexical connection to the residents who once possessed them, that animates narrative engagement with the site. This defines the second storytelling format: *the Tale of Apocalyptic Afterness.*

The third approach to the Zone that the Article I identified was forwarded by those who visited the Zone on an unofficial tour, also called the Stalker or Chornobyl Urbex Tour (Chernobyl Explorer 2025). The visitors in this category enter the Zone by trespassing. In practice, this means that they place themselves outside the official safety regulations of the CEZ; they access the area with an unofficial guide; they explore the area outside the marked routes for visitors; and they enter the ruins and buildings of various kinds in the Zone. This provided an interpretation frame that rejected the established regulations and gradual standardisation of the tours in the Zone. Thus, this visitor position was conceptualised as an *adventurer.* It must be addressed here that, whereas the editors of the journal where the Article I was published recommended using the term *unofficial tour*, the respondents themselves were consistently describing the tours as *illegal tours*.

Due to this type of spatial encounters, respondents experienced the landscapes of the Zone through the mythical attributes they attached to them:

> *"Time moves in a different rhythm; you mostly travel at night, so that alone. . . It turns the way you used to live upside down. It is a lot to describe, really."*
>
> — Respondent 33

The respondent emphasised the Zone's transformative qualities, its capability to turn the ordering of the world upside down. The forest traversed during the tour was not experienced as any forest, but as the forest of the Zone: a landscape abandoned by its inhabitants for over thirty years, where nature had reclaimed space entirely free of human presence. This untouched, radioactive wilderness carried its own charge, at once thriving and unsettling, that deepened the visitor's imaginative engagement with the site:

> *"When you are there, you really have this feeling like a box of Pandora in the room, because everything is empty over there, and you have the feeling it could be there. You know it is not there, but your imagination starts to work there."*
>
> — Respondent 11

Figure 26. Illegal visitors under the starry night sky in the CEZ 2019. Source: Jori Rotthier, reproduced with the author's permission

Figure 26 exemplifies these visitors' spatial practices. What is descriptive in the picture is not only the adventure it wishes to communicate, portraying the group of unofficial visitors under the starry night sky, but it also challenges the other visitors' spatial activities in the area and the commonly held understanding of the area as polluted and dangerous.

The night-time movements of the adventurers and immersive experiences were often informed by popular culture references such as the novel *Roadside Picnic* and Andrei Tarkovsky's film *Stalker*. Although the story of Stalker, as portrayed by Tarkovsky and the Strugatsky brothers, was not familiar to all interviewees, their accounts underscore this cultural reference, typical of the last years of the Soviet Bloc, given its atmosphere of impending destruction and mystical hopes for a better life. The narratives of *adventurers* foregrounded mystery, transformation, and transgressive intensity, forming *the Tale of the Mythical Zone*, in which the CEZ was reimagined as a liminal and otherworldly space.

The identified visitor profiles, their narrative engagements, and their distinct storytelling patterns collectively contribute to the co-creation of the Zone as a cultural text, and thus provide an answer to the first research question: "*In what ways do different visitor groups perform Chornobyl's heritage through narrative and visual representation?*" Thus, Article I shifts the focus of previous studies that have investigated the Zone and its functions as a heritage site (Rush-Cooper 2020; Stone 2013; Yankovska and Hannam 2013; 2018), to elaborate on what the Zone becomes through the stories people tell while moving through it and how the practice of photographing co-constitutes heritage dynamics.

The Article I presents an assessment of risk, spatial practices, and encounters with intangible narrative resources through a participatory and narrative lens, revealing how these elements establish the entangled dynamics in the Zone. It is through the attention of micro-politics of meaning-making of visitors' positionality that access to the materiality of the site and immaterial narratives is achieved. These performative practices are fluid and, at times, conflicting, reflecting the multiplicity of meanings and interpretations that shape the CEZ's cultural significance. The study demonstrates that visitors play an active role in bringing Chornobyl's heritage into public consciousness through performativity, positionality, and visual storytelling, thereby participating in the co-creation of its heritage value, and that these structures, in turn, script possible interpretations. The crucial contribution was to focus on the active role of images in the game of establishing and changing values (Mitchell 2005, 105). Examining both verbal and visual storytelling offers important insights into how different visitor groups engage in the narrative constitution of heritage and how these practices mediate and construct entangled spaces of memory.

The approach outlined in this Article I offers a framework for understanding the co-constitutive networks of visitor profiles within contested heritage settings. Visitors to the CEZ are not merely transmitting the site's established narratives; they are constructing stories about themselves as witnesses to an ongoing nuclear experience, and, in doing so, articulating broader cultural responses to living with nuclear technology and its risks. The Zone, as a space marked by radioactive pollution and governed by regulated yet transgressive modes of access, enables this negotiation.

Whether through the managed spectatorship of group tours, the spatial autonomy of private visits, or the deliberate rule-breaking of unofficial exploration, visitors engage in forms of deviant or semi-deviant behaviour that are themselves meaningful, a performative reckoning with contamination, danger, and the limits of institutional control. Through these patterns of storytelling and spatial practice, visitors become active participants in the composition of the social and cultural imaginaries surrounding nuclear disaster. Their tour choices, supplemented by their photographs, capture narratives of place that integrate experiential articulations into "ongoing social and collective memory practices" (Bareither 2021, 588), contributing to a living, contested, and visually mediated heritage of altered landscapes.

The methodological framework of this study extends existing research on nuclear cultural heritage and nuclear visual culture by focusing on its construction through interaction, imagination, and digital participation. Article I advances the understanding of visual storytelling as a central, performative process in heritage-making and calls for further investigation into the intersectionality, complexities, tensions, and ethical implications embedded in these frameworks.

4.2 Co-constructing Chernobyl: Investigating Visitors' Heritage Meaning-Making through Performativity in the Chernobyl Exclusion Zone

The second Article II answered the partial question: "*2) How do visitors' spatial strategies perform and communicate the inherited significance of the Chornobyl Exclusion Zone?"*

The Article II draws on the same data sample as Article I but extends the analysis by conceptualising the CEZ as a transnational tourismscape and an ambivalent heritage landscape in which meaning is continuously co-created through embodied visitor practices. The concept of tourismscape is central here, as it foregrounds the mutual construction of Chornobyl as a heritage site, revealing how people and things become entangled through complex processes of translation (van der Duim 2007). Rather than fitting neatly into established heritage categories, the CEZ resists conventional classification. As Storm (2014) argues, contested heritage eludes stable categorisation, emerging instead through ongoing cultural negotiation and reinterpretation. Recognising nuclear heritage as inherently ambivalent, laden with conflicting symbolic investments, the Article II examines the Zone as a site that oscillates between trauma and fascination, decay and creativity, danger and risk. Within this framework, performative memory as a material-discursive practice becomes the key analytical lens: the practices through which visitors resist or reframe official narratives promoted by tour providers and processes of marketisation (Gutman and Wüstenberg 2022; Molnár et al. 2023).

While the interpretation of the Zone's past can be situated within the framework of dissonant or difficult heritage (Tunbridge and Ashworth 1996), the diverse ways in which tourists engage with its material and symbolic resources call for more nuanced conceptual tools, particularly to account for interpretations that move beyond framing the Zone solely as a site of dark heritage. Article II advances the study of tourism in nuclear-related sites by applying the concept of ambivalent heritage (Chadha 2006; Donaldson 2018; Storm 2014), thereby expanding heritage scholarship to encompass the layered, embodied, and performative engagements of visitors to the Zone. Thus, the focus moves from the mere meaning of the nuclear past to *the meaning of the past expressed through practice*.

Article II supplements existing investigations of the Zone (Duda 2023; Hannam and Yankovska 2013; Hutching and Linden 2018; Rush-Cooper 2020) by closely reading the micro-politics of visitors' spatial strategies and their contribution to the site's broader heritage dynamics. It fills a research gap by treating visitors as active agents of heritage whose spatial practices shape, rather than merely reflect, the meanings of the Zone (Molnár et al. 2023; Smith 2006). As Banaszkiewicz (2023, 94) observes, dark tourism researchers have noted the variety of tourist experiences at sites of dissonant heritage, shaped by the complexity of visitor motivations and needs. In this article, I set official, authority-driven memory and formal tourism infrastructure against informal practices, illicit touring, and playful or transgressive engagements that generate competing interpretations. Through a performative approach (Smith 2006), it illuminates how visitors' spatial strategies are situated within the wider transnational tourismscape, positioning visitors as producers of both conformity and friction (Pfoser and Keightley 2022). These performative dynamics reveal how the inherited significance of the site is constantly redefined, contested, and lived.

Article I identified three performative dispositions — *spectator, explorer, and adventurer* — corresponding to the three tour formats available in the Zone: group, private, and unofficial. The narrative analysis in Article II supplements that typology by examining visitors' spatial strategies as *a form of communicative practice.* Each performative disposition is linked to a distinct spatial strategy, *conformity, enactment, and contestation,* which in turn corresponds to a particular material-discursive framing of the Zone's significance (Table 9). Together, these dispositions and strategies reflect the mutual dynamics that constituted the CEZ's tourismscape in 2019. The perception of radiation risk runs through all three, adding a further layer to visitors' use of space and their interpretation of the Zone's ambivalent and toxic heritage resources. Categories describe practices and goals of action, shaped by factors such as available time, risk assessment, and requirements for personal interpretation. They are not evaluative; they carry no assumptions about the authenticity of an action or its ontological proximity to the object.

Table 9. Results of the thematic narrative coding.

Type of tour	Group tour	Private tour	Unofficial tour
Performative disposition	Spectator	Explorer	Adventurer
Spatial strategy	Conformity	Enactment	Contestation
Risk perception	High	Moderate	None

The first visitor entity, *the spectator,* engages with the materiality of the Zone primarily through conformity. Following marked tourist routes and pre-planned itineraries, spectators participate in a performance that is choreographed in advance. Their engagement is defined by distant contemplation rather than direct, embodied interaction, centred on the impression of "being there." By adhering to prescribed paths, their movements reinforce officially curated narratives and authorised interpretations of the site, reproducing rather than contesting its heritage framework. This conformity, however, is not passive: it reflects a particular negotiation of risk, in which the dangers of radioactive space are managed through institutional mediation and spatial regulation.

The second visitor entity, *the explorer,* represents an autonomous personal mode of engagement. Typically choosing private tours, explorers position themselves closer to the Zone's materiality, seeking sensory immersion, atmospheric attunement, and embodied encounter with artefacts and abandoned objects. Rather than moving through prescribed space, they enact it, negotiating personal routes beyond standardised itineraries and exercising agency over their movements and interpretations. This performative enactment expresses a desire to move beyond guided experience toward individualised meaning-making, and entails a more direct negotiation of safety boundaries: risk becomes a condition of authentic experience rather than something to be avoided.

The third visitor entity, *the adventurer or illegal tourist*, constitutes the most transgressive form of engagement. Operating entirely outside official frameworks and safety regulations, adventurers contest the storyscape through unauthorised spatial practices, deliberate norm-violation, and embodied risk-taking. Their interactions are charged with intense sensory and physical engagement, through which they construct highly transformative and often oppositional interpretations of the Zone. This performative contestation challenges the boundaries of authorised heritage and reconfigures the CEZ as a space of alternative meaning-making and subcultural identity. Crucially, it is through this transgression, the crossing of radiological and institutional boundaries, that the Zone's ambivalence is most acutely felt: danger is not mitigated but embraced, and pollution becomes the very condition of a counter-cultural encounter with nuclear heritage.

Visitors engage with the heritage resources by following these performative and communicative material-discursive patterns, and they employ specific spatial strategies to either conform to or negotiate and exceed the existing framework of rules. Furthermore, while these differing visitor entities demonstrated varying degrees of engagement due to differing intensities in the material landscapes of the Zone, there is a further tendency that these visitor entities can be interpreted as demonstrating.

> *"I was fearing that it had already gotten too big; my fear was that we would see too many people and that too many people would go there. The experience will not be so unique because, yeah, it is so overrun by people. But it did not happen; maybe it happened a little bit at the Ferris Wheel."*
>
> — Respondent 13

These identified performative and communicative discourses expressed satisfaction regarding the standardisation of tourism. Visitors' performances exemplified the stakeholder's active mnemonic agency and practises of producing a style of exploration that would be free from regulations (Edensor 2001; Garret 2015). Thus, there is a further dimension that these visitor entities stand for, as this excerpt reveals:

> *"It is not emotion or imagination (the official tours); the guide is just telling what this is and what that is. I want to dig into the story, the exact things that were left behind; that kind of thing is better explored by yourself in your own time to get a full picture of exactly what they went through."*
>
> — Respondent 2

The excerpt underscores the Zone's character as a site where personal meaning-making is negotiated from the moment of entry, signalling its function as an emergent and non-institutionalised heritage site in which many practices unfold informally. One avenue for creating value within this context is the exercise of agency through informal networks as spatial privileges (Edensor 2007).

The Article II answered the second research question*: "How do visitors' spatial strategies perform and communicate the inherited significance of the Chornobyl Exclusion Zone?*"

Grounded in empirical data, the typology developed across Table 9 and Figure 27 offers a lens for understanding visitor agency in nuclear heritage contexts, framing the Zone as ambivalent and disrupting binary thinking by foregrounding heritage as negotiated, unstable, and relational. The Zone's magnetic appeal, its

capacity to stimulate imagination, evoke novelty, induce adrenaline, and encourage personal risk-taking, sits alongside its hazardous and traumatic history, and it is precisely this tension that animates visitors' spatial strategies. Each visitor category articulates and performs Chornobyl's heritage through distinct dispositions and spatial practices. Their engagements leave tangible and symbolic traces on the storyscape, manifested through material-discursive performativity that together compose a layered mnemonic field. While the intensity of engagement varies across these groups, a shared tendency emerges: a collective negotiation of agency within the increasingly standardised nuclear tourism framework. Furthermore, Article II elaborates on the possibility of mobilising altered landscapes to express experiences and identities connected to escapism and transgression. The visitors' choreographies, whether *conformity, enactment, or contestation,* can be read as active practices of reclaiming autonomy and shaping the modalities of experience in the Zone.

Figure 27. The dynamics of the storyscape as captured from the narrative analysis.

The desire for freedom of exploration and control over one's sensory encounters emerged as a crucial motivational factor distinguishing private tour visitors from those who opt for unofficial access. This is a finding with broader applicability: it can serve as an analytical backdrop for investigating perceptions of risk, radioactive exposure, and performative transgression as modes of norm-contestation at other nuclear tourism and heritage sites. Nuclear culture is particularly fertile ground for such analysis, as it encompasses multiple subject positions that challenge official and institutional narratives, enabling the performance of deviant or rebellious identities. Article II thus opens a perspective on experiences that remain under-theorised, illuminating their resonance within the broader terrain of atomic culture.

4.3 Chornobyl Visual Lexicon: Exploring the Visual Framing of Toxic Heritage from the Point of View of Participatory Culture

The third research Article III sought to answer the third partial research question: *"3) What visual distinctions can be observed in visitors' photographs of the Chornobyl nuclear disaster Zone from 2008, 2013, and 2018, and how have these representations temporally evolved?"*

Article III is an exploration of how participatory visual culture, specifically, user-generated photography on Flickr, shapes the evolving heritage discourse of the Zone. By analysing photographs taken in 2008, 2013, and 2018, Article III traces the semiotic transformation of the Zone's visual representations, revealing how visitors' photographic practices co-create the site's meaning as a toxic and nuclear cultural heritage. The research is situated at the intersection of heritage studies, visual culture, and digital ethnography, and it contributes to understanding how non-institutional actors participate in the heritagisation of post-disaster landscapes.

Article III valorises two important developments: the first is the temporal scope, which spans over a 10-year time frame, and the second is the acknowledgment of visitors' activities even before the official opening of the CEZ in 2011. These two perspectives bring analytical depth to discussions of the Zone's visual culture, in which photography functions as an interpretative medium, shaping how society understands, remembers, and responds to nuclear disaster, and in which various photographic categories produce different kinds of knowledge and memory (Richardson 2026). As Bürkner (2014) notes, every photographic strategy developed in response to the disaster is a workaround rather than a solution, and each produces a different kind of knowledge and meaning about the disaster. Empirical contribution of the Article III lies in combining nuclear visual culture (Carpenter 2016; O' Brian 2015; Volkmar 2022) with vernacular participatory culture to demonstrate how digital platforms, such as Flickr, democratise visual heritage-making and establish a communicative space for the formation of a broader discursive and cultural response to nuclear catastrophes.

The empirical investigations of Article III address the vernacular dimension of the networked image in the context of nuclear visual culture. The rise of Web 2.0 and social media has dispersed agency of image-making (Lehner 2023). Digitalisation has reorganised production, consumption, and circulation of images, while expanding the technical possibilities for shaping depicted reality. Unlike analog aesthetics, digital images foreground temporality through their durational, performative, and relational characteristics (Dewdney and Sluis 2023) and must therefore be studied in relation to the experiences they participate in (Bareither 2021). In this context, photography is a tool for world-making (Larsen 2006; Waterton and Watson 2010), not just a mere documentative device. Avoiding

dichotomic thinking and the distribution of heritage expressions along the continuum of authenticity versus inauthenticity, Article III elaborates on the wider referential discourses in the Zone. The analysis of visitors' uses of semiotic resources to communicate presence, experiences, and claims about the past directs the focus *to the visual and the dynamics of the visual* in heritage-making. Definitional referents are part of an ages-old social dynamic that elevates one experience at the expense of another, destabilizing any intrinsic meaning and pointing to a larger dynamic (Uricchio 2011, 33–34).

The study employed a longitudinal mixed-method approach combining content analysis, social semiotic analysis, qualitative interviews, and participant-generated images (PGI). An initial sample was manually collected from Flickr in January–February 2023 through purposive sampling with a maximum variation strategy (Bryman 2016; Creswell and Poth 2023). Three keyword searches (Table 10) yielded three image categories, with 200 images retrieved per year category (2008, 2013, 2018). A preliminary social semiotic analysis (Kress and van Leeuwen 2021; Vannini 2007) identified four broad representational changes across the sample: utilisation of the NPP, exterior and interior depictions, compositional complexity, and picture modification techniques. Uploaded content doubled between 2008 and 2013, with a slight decline in 2018, likely reflecting competition from other social media platforms.

Table 10. Longitudinal data characteristics.

SAMPLE YEAR	2008	2013	2018
KEYWORDS	Chernobyl 2008	Chernobyl 2013	Chernobyl 2018
NUMBER OF VISITS	5500*	17575*	72163*
UPLOADED PICTURES	5216	10233	9509
SAMPLE SIZE	n=200	n=200	n=200

* Data source: State Exclusion Zone Management Agency, 2020

Four broad semiotic changes emerged from the longitudinal sample:

1) *A decrease in the representation of the power plant (see Figure 28)*
2) *A move from exteriors to interiors in the pictures (see Figures 29 and 30)*
3) *Increased complexity in image composition (see Figures 31 and 32)*
4) *Heightened modality of the images (see Figure 33)*

To gain a deeper understanding of the identified semiotic patterns, I conducted qualitative interviews in the second phase of the study with 18 members of the Flickr

platform who had visited the Zone in 2008, 2013, and 2018. The four observations from the content analysis were discussed from the participants' perspective. In analysing the interview data, the focus was on the specific ways in which the tours have evolved over the years, the development of representational technology, and the particular practices that the interviewees identified as participants in digital visual culture. From the interview-transcribed data, it was possible to identify clarifications for the initial observations (Table 11), and these structure the analytical discussion.

Table 11. Results of the socio-semiotic analysis.

SEMIOTIC RESOURCE	POWER PLANT	INTERIORS	ARTEFACTS	MODALITY
TEMPORAL SEMIOTIC CHANGE	Loss of significance	Interior domination	Complexity increases	Increase
SEMIOTIC FUNCTION	Informative	Personal/ expressive	Imaginative	Pleasure
PRACTICE OF PHOTOGRAPHING	Documentation	Creativity	Distinction	Reality of experience

Figure 28. The nuclear power plant covered by a Soviet built sarcophagus in 2008. Source: Jim Hart, reproduced with the author's permission.

The first observed semiotic change concerned the power plant as a communicative representation. The Soviet-built sarcophagus was constructed by the liquidators in the aftermath of the disasters to cover the exploded reactor. In 2008, the power plant and the sarcophagus emerged as dominant photographic motifs, serving as semiotic anchors through which the CEZ was visually and culturally articulated. Symbolical objects, such as the old power plant, sarcophagus, and chimney (Figure 28), lost their attributes of originality and visual significance along with the development of tourism, gradual marketisation, and the establishment of the New Safe Confinement (NSC). As a consequence, the informative value of the NPP and the original sarcophagus shifted. A respondent described:

> *"I was fortunate because I went ten years ago. I managed to see the chimney and the funnel before it got demolished because it was demolished before they moved the NSC over."*
>
> — [7]

The activity of urban exploration and the appreciation of ruins influenced the way the CNPP was evaluated in the later years of tourism. A respondent [5] who visited CEZ in 2018 elaborated on their experience at the NPP:

> *"It's almost, yeah, a modern building. With the shiny cap on it. So yeah, not really... Urbex beneath, yes, but not on the outside."*
>
> — [5]

The excerpt illustrated a semiotic shift; as the site's touristic infrastructure and interpretive narratives matured, the focus of visual attention dispersed toward landscapes in Pripyat and abandoned interiors. The urban exploration aesthetic added an influential visual discourse on the Zone as photographic imagination, showing the transformation of expectations and engagements with the site. Photography shifted from a *documentary to an interpretive and affective register*, less about proving the event and more about performing one's relation to the spectral remains of the disaster. In this transformation, the semiotics of representation gave way to the semiotics of expressing the experience, with the act of photographing becoming a means of participating in, rather than merely depicting, the ongoing production of the nuclear landscape.

Figure 29. The Pripyat amusement park in 2008. Source: Jim Hart, reproduced with the author's permission.

The second semiotic shift concerned the interior domination in the visual representations. In the sample year 2008, pictures taken on exterior surfaces comprised the majority, whereas in the sample of 2018, interior pictures were dominant. Figure 29 is a representative picture from 2008. The image shows the practice of documenting the exterior scenes in the Zone, depicting the amusement park in Pripyat, with the Ferris Wheel and a broken wagon from one of the attractions. In 2008, respondents repeatedly expressed that not only did the tours move more to the exteriors, but the camera devices also placed restrictions on what was possible to capture.

As tourism grew, material resources became embedded in the value systems of touristic and non-touristic routes, leading to the amusement park's classification as a "touristic category" and a corresponding decline in its photographic significance. The emergence of private tours as a material-discursive practice further conditioned opportunities for site exploration, photography, and the negotiation of exploratory freedom. Technological advancements also enabled the interiors of buildings to facilitate greater opportunities for *personal meaning-making*, as described by an interviewee [1] who visited Chornobyl in 2018:

> *"So, I think inside you're not limited; you want to have a shallow depth of field close up of something, or you want to have like a room that has, let's say, a mural and then stuff on the ground. So, I think your creative freedom inside is wider and bigger than if it comes down to the exterior of a building. "*
>
> — [1]

Figure 30. Interior semiotic shit captures the Pripyat hospital waiting room in 2018. Source: Fenja Verhagen, reproduced with the author's permission.

The excerpt illustrated the merging of technology and spatial possibilities, as access to the interiors has been prohibited since 2011, yet often negotiated through the visitors' requirement for personalised experiences. In combination with the affordances of digital technology, the use of the interior materiality found new expressions through shallow depth of field (DOF) to create a dreamy, focused effect in the images (Figure 30). Particularly enhancing the storytelling elements in a picture, these affordances have shaped interior aesthetics as a semiotic resource.

Figure 30 depicts a waiting room in Pripyat Hospital in 2018. The photographer draws on familiar interior semiotic cues: peeling wallpaper, decaying furniture, moss growing on the floor, and the recognisably familiar object, a plant in a flower pot amid a deteriorating scene. Photography has become a key way of *creatively* engaging with such material remains. It affords experimental freedom and space for personal meaning-making, encouraging an interactive, attentive relationship with the material world itself (DeSilvey 2017; Pétursdóttir and Olsen 2014).

The third semiotic change concerned the compositional complexity; from 2008 to 2018, this semiotic pattern of communication became pronounced. Photography has always had a storytelling capacity, with photographs embodying the tension between the objective neutrality and the subjective engagement of the photographer (Becker 2015). The staging of artifacts in pictures has been an integral part of photography since its inception, also in the Zone. A respondent [17] who visited the CEZ in 2008 described the placement of certain artifacts encountered during the tour.

Figure 31. A toy bear left on the booth of the Ferris Wheel in Pripyat in 2008. Source: Pedro Moura Pinheiro, reproduced with the author's permission.

> *"This was manipulated for emotional value. Someone put this saying: See, now you think of the children who have used this amusement park. So, you create something like a link. But it's not real because, you know, this wouldn't be; it was clearly placed after the glass was broken, so it wasn't left there."*
>
> — [17]

The act of forging connections, aligning one's experience with site narratives through meaningful semiotic symbols, must be understood within the context of photography as a medium of communication. For instance, in Figure 31, a toy bear placed on a Ferris Wheel booth in Pripyat serves as a reminder of the abrupt disruption of daily life during the evacuation. Certain visual connections to past narratives have acquired cultural resonance in representations of the nuclear disaster and its aftermath, becoming recognisable symbols that visitors consciously or unconsciously carry into their visit. These elements function as signs within communicative systems that extend into the afterlives of images and their circulation

(Dewdney and Sluis 2023; Thouki and Skrede 2025), while the selective mobilisation of traces associated with former residents operates as a curatorial rhetoric through which visitors assert truth claims.

The contribution of Article III was to elaborate these marking activities through the Zone as a *photographic imagination*, and through the image as a translational device that synchronises broader representational discourse, material experience, and visitor rhetoric to renew the storytelling of the site.

Figure 32. Composition of toys in Pripyat in 2018. Source: Frank C. Grace, reproduced with the author's permission.

In Figure 32, an assortment of toys is arranged on a bench in a kindergarten in Pripyat, creating an impression of the scene frozen in time, utilising the narrative familiar from Figure 31, which emphasises the loss of everyday lives due to the evacuation in Pripyat. The photographer incorporates familiar objects that evoke nostalgia while also displaying a complex compositional style; the objects used for storytelling have multiplied. In 2018, many visitors to the site were aware of others who had also journeyed there, and they had encountered numerous photographs captured within the surrounding area. A respondent described:

> *"If you can't go there, you know, maybe by looking at the photo, the way it's processed and edited, and everything else, you'll get the same feeling that I did. So, I want you to. You know, see the place. Look around the place. Smell the place through just looking at it, and yeah, I wanted to get my own, to put my own take on."*
>
> — [3]

As more visitors flow through the spaces, they leave their traces on the materiality. The organisation of the artefacts, supported by the affordances of the tour and freedom for personal exploration, has enabled complex visual framing, where the semiotic resources are utilised through their *imaginative* function. Instead of favouring the *documentary and informative* reading of the landscape, the pictures seen earlier became the reference point, allowing the participants of visual culture to create connections to the past in a qualitatively different manner.

Figure 33. The utilisation of editorial techniques exemplifies the reality of feeling. The picture was taken at the hospital in Pripyat in 2018. Source: Frank C. Grace, reproduced with the author's permission.

As a result, visitors expressed a desire to craft their unique photographic narratives, creating visual representations with their individual imprints. Thus, the practice of photographing and the knowledge retrieved from the heritage resources were based on *distinction.*

The fourth observation concerned the increase of modality in the visual representations. In 2008, Photoshop techniques were marginal. The shades in the pictures started to tone darker in 2013, and modified pictures became a dominant mode of representation in 2018. Whereas in the early years of tourism, the visitor's photography worked for documentation purposes, in the later years, *the reality of*

experience became the dominant mode of representation. As such, there is a noticeable departure in the manner in which semiotic resources are being employed, almost as if they are being fashioned into imaginative constructs, fantasies, and caricatures (Kress and van Leeuwen 2021). This also marks a shift in the understanding of the photograph as a simple documentation of reality.

In Figure 27, the viewer is presented with a room in the maternity ward of Pripyat Hospital. The maximum representation of detail through saturation brings forth the peeling wallpaper and the figures on the floor. Saturation changes the intensity of the picture, emphasizing the materiality of the things, the cracking, grounding, and splintering of all matter. The development of representational devices has contributed to "the new concerns for the material and how we present and mediate things and our encounter with them" (Pétursdóttir and Olsen 2014, 13). This approach aims to break the confines of mundanity and create a compelling visual experience. One participant [2] explained the rationale behind using modality as an effect in photography:

> *"Yeah, I edited the pictures. I think I made them a bit more intense, like adding more contrast. And some pictures, I used a filter to make it a bit darker or a bit more mysterious in a way, just to really express the feeling that I got there. So, the pictures—yeah, I really want to show my feelings in the pictures that I took. So that's what I tried to transfer into the pictures."*
>
> — [2]

The semiotic function is based on the effect of *visual pleasure* (van Leeuwen 2005), and it should be understood as a representation of jointly curated rhetorical truth-claims in participatory culture. The evolution of the Zone's visual representations must be understood within the framework of wider definitional dynamics, image ecologies, and communicative statements through the networked image (Dewdney and Sluis 2022; Uricchio 2011). Article III alleviates the connection between experience, materiality, and digital circulation, showing how these translate into semiotic patterns that become pictorial conventions that mediate the memory.

This article sought to answer the third partial research question: "*What visual distinctions can be observed in visitors' photographs of the Chornobyl nuclear disaster Zone from 2008, 2013, and 2018, and how have these representations temporally evolved?"*

Article III broadened the understanding of photography and heritage by indicating its peculiarities and goals as a tool of communication, not merely understanding the staging of the pictures as a tourist act (Duda 2023). The utilisation of semiotic resources through photographic practices forms discursive spaces where

their semiotic function is *informative, expressive, imaginative*, or based on *pleasure*. Article III elaborated on the photographic practices of *documentation, creativity, distinction,* and the *reality of experience,* and how they communicate engagements with the heritage and produce discursive knowledge on the significance of the Zone. The emerging informal knowledge regarding the visits, the separation of the actual place and the place as experience and imagination, and the possibility to engage with the materiality of the Zone creatively have been those parameters that have influenced perceptions and knowledge of the Zone's heritage. The results of the article are clear indicators of semiosis (Rose 2023); the interpretation is inserting a sign with new meanings, which in turn then becomes interpreted again, a constant reformation of material resources at the heritage sites through its semiotic elements and their subjective interpretation.

As Bareither (2021) indicates, the affordances of digital media and cultural interactions are a fruitful basis for the analysis. This is important to acknowledge in the realm of nuclear visual culture, which in many ways is a symbolically and culturally layered text. New digital technologies have opened up novel points of access to this symbolic production (Ojala forthcoming). The main purpose of Article III was to indicate how visitors' visual participation shapes the meanings, atmospheres, and ethics of nuclear heritage, instead of just representing them, reframing the Zone not as a static site of memory but as a dynamic, co-created visual landscape, shaped by evolving technologies, aesthetic sensibilities, and visitor subjectivities.

The work challenges traditional heritage paradigms by foregrounding the agency of the amateur photographer and the fluidity of meaning in post-disaster spaces. Thus, Article III provided a clearer understanding of the practices of the Zone's visual culture and the utilisation of communicative and persuasive strategies concerning the accident and its visual manifestation. In the article, I am suggesting that the Zone as a photographic imagination and the possibility to participate in the creation of images and imaginaries have been a significant appeal behind the motivation to visit the site. Thus, *the photograph* must be acknowledged also in the public sphere as a distinct analytical, imaginative layer.

The article's research also deserves critical remarks. The sample was collected solely on Flickr, which may not reflect broader visual trends on platforms like Instagram. On the other hand, the Flickr platform supplemented the data collected for Articles I and II from the Facebook platform. There is a demographic bias in the interview sample, which is predominantly male and Western, potentially limiting the generalisability of the findings. Although the sample is demographically representative of the practitioners of the CEZ's visual culture. The invisibility, complexity, and uncertainty of many toxins, combined with an image-fixated Western audience, make constructing a compelling and potentially transformative visual frame an ongoing challenge (Peeples 2010, 388). Future studies could address

the present bias by sampling data from female visitors and extending the analysis to visual heritage discourses in other continents and cultural contexts.

4.4 Chornobyl and Fukushima Visual Archives: Visitors' Practices of Curatorship of the Nuclear Accident Sites

The fourth research Article IV sought to answer the final partial research question: *"4) In what ways do the visual narratives of the Chornobyl and Fukushima disaster sites diverge concerning post-nuclear imaginaries?"*

Article IV offers a comparative analysis of how visitors' photographic practices shape the imaginaries and cultural memory of two of the world's most well-known nuclear disaster sites in Japan and Ukraine. This analysis builds on the datasets collected for Articles I and III, foregrounding visitors as active participants in the construction of site archives and collective memory.

As shown in the previous articles (Article I; Article III), the participatory visual culture introduces new forms of nuclear heritage-making in which the public plays an active role in shaping memory through their images. For the Zone, the mobilisation of photography as a mediating tool at the intersection of meaning-making and heritage construction has generated novel insights into the site's cultural significance, as evidenced by Articles I and III and corroborated by scholarship from Goatcher and Brunsden (2011), Bürkner (2014), and Richardsson (2026). The role of visitor photography in shaping perceptions of Fukushima, however, has been comparatively neglected. Article IV addresses this gap by examining how visitors' photographs from Chornobyl and Fukushima co-create responses to radioactively altered landscapes.

The two accidents in Chornobyl and Fukushima are classified as "major" nuclear accidents, according to the International Nuclear and Radiological Event Scale (INES). As Pareniuk and Yasuda (2021) note, Chornobyl and Fukushima offer contrasting laboratories for studying the social and cultural consequences of nuclear accidents. While the Zone has been maintained in a state of pending disaster with a recognisable visual representation, the recovery efforts in Japan are progressing dynamically and remain an active ongoing process (Kawasaki 2023).

As discussed, different labels, *dark and hope tourism,* characterise the influx of visitors to these areas. The concepts should not be seen as forming opposite continuums; *dark tourism* operates as a broad academic concept, one that encompasses *hope tourism* within it, whereas hope tourism was developed specifically as a marketing tool for Fukushima's revitalisation, alongside other recovery-oriented initiatives in the Tohoku region such as BOSAI Tourism and Recovery Tourism (Gerster et al. 2021). In the article, I am contrasting these two

concepts and discussing the way they enable visitors to interpret the disasters' temporalities through photographs. The activity of photography is seen as an approach to the past and future that mediates between the co-created temporalities (Marila and Andreoletti 2025). I argue that the visual representations of participatory culture contribute to the overall socio-cultural understandings of these sites and the techno-social imaginaries surrounding the relationships between civilisation and technology, and the forms of hope these toxic landscapes enable to express.

The socio-semiotic analysis revealed the material-discursive co-creations of the visual heritage frames of the two disaster sites (Kress and van Leeuwen 2021; Rose 2023; van Leeuwen 2005). The analytical focus of the Article IV is placed on the imaginative horizon, the possibilities of evoking and imagining the landscapes as part of heritage practices, and the possibilities of expressing these narratives through semiotics (Waterton and Watson 2014). The identified visual discourses translate into negotiations of risk, remediation, and the relationship between societies and conditions of life in post-radioactive spaces. The results of the analysis are condensed in Table 12 below.

Table 12. Results of the socio-semiotic analysis. The elements of imaginative horizons.

Site	**Chornobyl**	**Fukushima**
Visitation framing	Dark tourism	Hope tourism
Landscape	Time capsule	Transformation
Semiotic tool	Sensory coding	Abstract coding
Photographic interpretation	Temporal curatorship	Normalisation

The policies implemented in the aftermath of the FDNPP accident are in stark contrast to those introduced after the Chornobyl accident (Kawasaki 2021). These socio-political contexts have established radically different imaginative horizons around nuclear technology, risk, and the cultural significance of each area. By exceeding human perception and understanding at multiple levels, the Zone became a powerful vehicle for cultural projection, serving as a metaphor for a post-industrial condition in which nature reclaims what civilisation has left behind (Bürkner 2014). When nuclear technology becomes the focus in such a context, visitation extends beyond memorialising past disasters; it reconfigures how nuclear phenomena are perceived, experienced, and envisioned, in both the present and in potential futures (Sukhenko and Pál 2021). Nuclear dark tourism thus centres less on witnessing death and more on confronting the unrepresentable dimensions of modern technological risk (Martini and Sharma 2022; Storm 2018), while simultaneously opening a space in which visitors negotiate what that risk means for the future.

In Fukushima, the recovery efforts since 2016 onward have focused on decontamination, demolition, and reconstruction, yet returnee numbers remain low, as farms and businesses continue to suffer from material damage and the enduring stigma of contamination (Kawasaki 2023; Martini and Sharma 2022). Rehabilitation is promoted within the discourse of hope tourism; the technological defeat and risks are supplemented with narratives and imaginaries that alleviate innovation, recovery, and transformation (Kawasaki 2023). These divergent orientations, one toward an unresolved past and unknown consequences, the other toward an imagined future of closure, produce fundamentally different semiotic landscapes and photographic possibilities to interpret the significance of these sites. This contrast is not merely one of tourism policy but of underlying temporal orientation and, with it, the semiotic resources available to express each site photographically.

Figure 34. Pripyat cityscape in 2013. Photographed by Mike Flew and reproduced with the author's permission.

The characteristics of Chornobyl discourse are well facilitated through signs, meanings, symbols, and associations connected to the object (Hundorova 2019). The symbolically charged landscape of the Zone has enabled the formation of imaginative narratives through semiotic resources that operate via *sensory coding,* privileging *affective and embodied responses over conceptual meaning*. Images are not detached representations but are entangled with bodily movement and perception, both arising from and actively shaping the production of place (Pink 2011).

For instance, Figure 34, a photograph of a respondent taken in Pripyat in 2013, exemplifies the sensory coding that dominates Zone's visual culture. Enhanced through the photographer's post-processing decisions that deepen its atmospheric darkness, the image renders the abandoned cityscape as a dystopian testament to

technological catastrophe, a place emptied of life, with the moment of evacuation seemingly etched into the landscape itself. The looming, ominous atmosphere works directly on the viewer's senses: it is felt before it is interpreted. Sensory coding through the discourse of technological sublime performs exactly this operation; it translates the scale and incomprehensibility of nuclear disaster into an experiential register, producing the mental state Peeples (2011, 379) associates with the inability to grasp the power, vastness, and magnitude of what one witnesses.

The Zone is a layered and dense narrative template, drawing on elements of both reality and fiction to sustain its significance as an apocalyptic wasteland, a site of transgression and escapism (Article I; Article II). Photographs of decaying Pripyat or a rusted Ferris Wheel reactivates the collective memory of civilisation's fragility in the face of *an uncontrollable atom*. Through their repetition, these visual codes crystallise into recognisable iconographic patterns that anchor meaning within digital ecologies (Sluis 2023; Uricchio 2011), collectively constructing the Zone as a site defined by mystery and mythological resonance. Such fantasies of extinction and confrontation between technology and civilisation co-create imaginaries of *post-apocalyptic hope*, peace that can only come when mankind has vanished (Horn 2018, 2). A respondent reflected on how these narratives structure the experience of visiting:

> *"I think it is very powerful, and maybe this would be the case even without zombie films or apocalyptic films, but that's in the imagination. Imagining a world without us or imagining us again in a kind of narcissistic way, being the last human being alive. So that's sort of a bit like fantasies of being at your funeral, of a kind."*
>
> — Respondent 8

Figure 35. A corridor in Pripyat school, picture taken in 2019, photographed by Peter Costello and reproduced with the author's permission.

Figure 35 condenses the narrative expressed in the interview excerpt. The photograph depicts the Pripyat elementary school corridor, marked by peeling wallpaper and rusted ceiling lights. The Zone's abandonment has been a successful visual representation precisely because its elements, decay, arrested time, and the sudden absence of human life, map onto culturally available narratives of myth, enabling photographic storytelling that is immediately legible across different audiences and platforms as a communicative event (Sterling 2016). Within this symbolic framework, the landscape is evoked in mythological terms to posit a counter-reality (Bürkner 2014). The success and persistence are supported by the sensory experience it evokes, which can be attached to elements that structure existential questions and ancient fantasies of a world without humans (Horn 2018), and comfort provided through melancholic hopes.

The myth-making capacities of the Zone were amplified and stabilised through the emergence of digital participatory culture. The imbalance in the volume of visual content between the two disaster sites is itself analytically significant, as it illuminates the different visual and spatial practices, online platforms, and semiotic resources available for expressing the relationship with technological failure at each site.

For instance, Figure 36, taken in a Pripyat hospital waiting room, elaborates the practice of temporal curatorship. The flower pot and benches are indicators of a past social life; the play of light and shadow introduces aesthetic contrast; the post-processing amplifies the visual appeal and simultaneously deepens the sense of arrested time. The photograph does not simply record decay; it curates it, imposing a particular temporal reading onto the landscape. The storytelling functions to emphasise the attributes that created recognisable communicative links to the understanding of the disaster as an interplay between discourse and materiality (Germundsson and Sanglert 2024). Through such practices, visitors participated in reproducing the Zone's imaginative horizon through myth, but also as a *future of things*, which is not simply about technological accidents per se, but about what those accidents reveal, the fragility of modern infrastructures, the limits of human control, and how the material world always exceeds our attempts to manage and predict it (Horn 2018).

Figure 36. A Pripyat hospital waiting room, pictured in 2019. Photographed by Dylan Pukall, reproduced with the author's permission.

The Zone's temporal horizon remains unknown, and it is this irresolution curated, reproduced, and circulated through participatory digital culture that keeps the imaginative horizon of technological defeat open and endlessly generative. Such fantastical creation of technological defeat function also as a lens through which to imagine the hopes and futures of the Anthropocene; the post-apocalyptic peace in a world after humans and latent imaginaries of hope, the transient nature of things, order, and infrastructure.

Figure 37. A parking area and a convenience store in Namie town in 2013. Photographed by Dylan Pukall, reproduced with the author's permission.

Fukushima demands a different semiotic mode: *abstract coding*, in which meaning is produced through conceptual and interpretive attention to transformation, process, and temporal change rather than through *frozen-in-time* sensory response. This distinction is structural: it follows directly from the nature of the landscape itself, which is not frozen but actively changing, and from the framing of visitation as hope tourism rather than dark tourism (Gerster et al. 2021).

Figure 37, taken in Namie City in 2013, illustrates the opposite ephemerality. The elements that signal the disaster are present, familiar infrastructure disclosed from its usual purpose, the abrupt interruption of everyday life, yet the image also carries an awareness of its own temporality: by now, the supermarket depicted has been demolished. The photograph thus captures not a frozen moment but a moment in transition, one that requires contextual knowledge to be fully read, and which also alleviates the shifting imaginative horizons in Fukushima.

The expert and artist visitors who comprised the majority of the Fukushima sample were those most attuned to navigating this shifting semiotic system. Their position, well-connected with local stakeholders, returning multiple times, often engaged in specific thematic or artistic projects, enabled them to read the transformation not as an absence of meaningful imagery but as a distinct photographic challenge; how to document hope, recovery, and the resumption of life in post–radioactive landscapes that resist the established visual grammar of disaster. The purpose of the transformation in Fukushima is to provide a closure for the disaster as an open-ended narrative and experience, and thus to deem the temporality of the triple disaster area as known, in opposition to the Zone's unknown attributes (Peeples 2011). This shifting imaginative horizon was described by an interviewee:

> *"And so, it's very fascinating that this is also kind of a blueprint for what it means to kind of reclaim and reopen areas in Fukushima."*
>
> — Respondent 13

Figure 38. A shopping centre parking area in Namie in 2019, photographed by Benjamin Kis, reproduced with the author's permission.

The notion of a "blueprint" is indicative of the imaginaries of hope. Where Chornobyl's visual discourse is oriented toward the past, toward what was lost, as a future warning, Fukushima's emerging visual discourse is oriented toward the future, what is being rebuilt, reclaimed, and reimagined. The absence of frozen-in-time imagery is a consequence of the landscape's semiotic condition: a site transforming cannot easily be fixed in a recognisable visual narrative.

Figure 39. The photograph depicts the same, yet transformed, shopping centre parking area in Namie in 2023. Photographed by Benjamin Kis, reproduced with the author's permission.

Figures 38 and 39 together demonstrate this. Figure 38, taken in 2019 in a shopping center parking area in Namie, signals the disaster through multiple cues and temporal stillness: abandoned vehicles, grass growing at the doors, objects blocked in place, the familiar rendered strange. The picture captures the moment when objects and infrastructure were still in place, waiting to be removed. Figure 39 returns to the same location in 2023: the pre-disaster infrastructure has vanished, and the space is now empty, signaling reconstruction yet offering no expressive elements through which either the disaster or its memory can be narrated. The landscape has been emptied of the semiotic resources needed to express the incidents and history. In these ongoing negotiations of memory and space, photographers engage in the sociocultural work of making sense of the disaster (Geilhorn and Iwata-Weickgenannt 2018), co-creating vocabularies and imaginaries which, through reflection and contestation, become possible.

The described temporality rejects the fixed visual iconography of the Zone in favour of a conceptual reading that acknowledges transformation, ambiguity, and the coexistence of entangled, reversed temporalties. A respondent articulated the experiential stakes of this shift:

> *"You know someone who's hoping to see ruins, right? Is not going to be rewarded in the same way. Going to an area where the Japanese government has invested billions of euros in redeveloping it, compared to the Chornobyl experience, right? It's just a transformed landscape."*
>
> — Respondent 3

The phrase "transformed landscape" captures both the challenge and the opportunity. Fukushima's visual culture of translation of ambiguous hope of transformed landscapes does not have the participatory momentum of the Zone's digital heritage communities, exactly due to the semiotically challenging environment, yet it is actively being constructed through the practices of expert visitors, artists, and researchers who are developing new semiotic resources to express what it means to live in, return to, and reimagine a post-nuclear landscape.

The tension between the institutionally projected optimistic future, collective disaster representations, and the complex lived realities of residents and visitors is the central dissonance of Fukushima's semiotic landscape. The discourse of normalisation and its effect on the landscape veiled the previous cityscapes, as the demolition and reconstruction have erased the former architectural styles and the meanings of these spaces for the community. As the reconstruction activities advance, the landscapes are being imposed with a new architectural hegemony.

> *"And so, there's also, you know, a real kind of disconnect between present imaginary around those spaces and what reopening means versus having gone through, so far, over a decade of trauma, of nuclear disaster, and before that, multiple decades of what it means to live in and around what the Japanese call 'the Nuclear Village'."*
>
> — Respondent 13

This points to a tension between official and experiential temporalities and disasters as constructs (Geilhorn and Iwata-Weickgenannt 2018; Horn 2018). The state-managed remediation sequence has its own timeline, but for former residents, temporality is saturated with loss, memory, and an ongoing present of displacement. These two temporal experiences and competing narratives reflect the dominant national discourse, which seeks to downplay issues related to disasters, and the other narrative is represented by people's views (Figueroa 2018b), signifying the tensions for conditions of hope in the area.

Article IV sought an answer to the question: *"In what ways do the visual narratives of the Chornobyl and Fukushima disaster sites diverge concerning post-nuclear imaginaries?"*

The comparative analysis of these two sites reveals not a simple opposition between hope and despair, recovery and ruin, but a field of *contested hopes*, plural, site-specific, and shaped by the particular socio-political conditions, imaginative horizons, and semiotic resources each landscape makes available. The article attached these processes belonging to the domain of vernacular nuclear visual culture and its long tradition, where the photographers have constructed images that document human-altered landscapes (Peeples 2011, 375).

The Zone's opening and the rise of digital technologies together enabled new forms of myth-making, crystallising widespread imaginaries of modern technological failure. In Hundorova's (2019) view, Chornobyl extends beyond its immediate geographical context to engage fundamental questions of post-apocalyptic existence, positioning it as a distinctly global phenomenon. The temporal curatorship of disaster, the sensory coding of the technological sublime, and the participatory momentum of digital heritage communities all work to reproduce the Zone as a site of unresolved catastrophe. Yet even in the Zone, the act of witnessing and photographing constitutes a form of melancholic hope embedded in imaginaries of nuclear wilderness after humans and broader responses of distrust concerning universal progress (Hundorova 2019; Zhukova 2016). Chornobyl's visual culture sustains this hope precisely by refusing closure; its openness keeps the question of nuclear risk alive, circulating, and culturally productive.

At Fukushima, hope is the explicitly stated orientation of tourism policy and recovery discourse, yet the visual expression of hope is contested and negotiated. The

transformation of the landscape progressively erases the semiotic resources, ruins, artefacts, and former cityscapes, through which the site's past and present can be narrated, while the new landscape of reconstruction has not yet generated a comparable visual grammar of recovery. The visitors who are most engaged with the transformation process are developing the grammar; assessing the projections of hope in a landscape that is actively becoming, rather than one that is fixed in a moment of catastrophe.

These two imaginative horizons, the *Zone's sensory, myth-saturated, temporally suspended visual culture*, and Fukushima's *abstract, conceptual, future-oriented one,* do not merely describe two different sites. They represent two different relationships between photography, memory, and hope in the aftermath of nuclear disaster: one in which hope persists through the refusal to forget, and another in which hope is expressed through the insistence on moving forward. As Article IV indicates, the comparative exploration between these two sites revealed the significance of *the disaster temporalities as heritage practices* that are not merely interpreting the past, but are future-oriented and can stimulate actions and imaginaries towards hopeful futures (Wollentz 2026) *as visions of hope and imaginative possibilities* in these altered landscapes.

By placing contrasting nuclear landscapes in dialogue, these images expose how dominant discourses have historically masked their own constructed nature and suppressed alternative representations of collective experience of the nuclear age; their open-endedness provokes viewers into a heightened sense of engagement with, and responsibility for, how narratives of the nuclear future are shaped and foreclosed (Taylor 1997).

As the two sites differ in the techno-social relationships by being imagined through the defeat and conditions of recovery with or without humans, the Fukushima area offers a critical lens for the examination of post-radioactive discourses:

> *"Fukushima is a site of human environmental trauma, but in many cases, places still contain low levels of radiation. And, there are multiple reasons to undertake this remediation. But what does post-radiation mean? And what does it mean to normalise these areas? Within that question of normalisation, there are all of these unspoken expectations around what it means to live there."*
>
> — Respondent 13

The excerpt reveals a fundamental tension between administrative definitions of recovery and the lived experience of those expected to return, exposing normalisation as a politically and socially constructed benchmark rather than an objective measure of safety. The notion alleviates the necessity to investigate the complex lived realities of post-nuclear landscapes and the types of interpretations given on these sites through photography.

While the analysis draws on extensive interviews and participant-generated images, an imbalance remains in the empirical material: Chornobyl is supported by a strong and well-established digital heritage community, whereas Fukushima lacks such platforms, resulting in smaller datasets and a greater dependence on expert and artistic interpretations. This asymmetry, though acknowledged, raises questions about comparability. It may also obscure how ordinary visitors to Fukushima, whose access is limited by property rights and reconstruction efforts, engage in forms of visual storytelling outside social media or in less visible, private ways. Moreover, the heavy focus on socio-semiotic analysis could be complemented by a closer examination of the political economy of tourism industries, government agendas, and the geopolitics of memory, particularly in light of the article's recognition of how top-down state narratives in Japan actively influence perceptions of recovery.

By adding a further insight into the research of Articles I, II, and III, Article IV opens up avenues for rethinking the role of non-institutional actors in heritage-making in differing socio-political contexts. The comparative move highlights the distributed, contested, and participatory nature of nuclear memory cultures. At the same time, it underscores the fragility of such archives, which are contingent on digital platforms, shifting cultural imaginaries, and evolving political contexts.

The four articles of this dissertation form a framework in which I have elaborated on the nuclear heritage from a participatory perspective and also through the conceptual lens of nuclear visual culture. The key finding, which is highlighted in all of the Articles I, II, III, and IV, is the role of the digital participatory culture as an agent that negotiates, contests, and transforms what becomes acknowledged as nuclear cultural heritage. As I located this research into the domain of nuclear visual culture, I showed how the novel digital technologies have opened access to the general public to its symbolic production. In addition, under the concept of nuclear visual culture, Articles I, II, III, and IV provided insights into the co-creation of unauthorised visual representations of altered landscapes, as well as the micro-dynamics of spatial performances, which, through the significance of the radioactive sites, are negotiated and contested. These investigations also provided a nuanced understanding of the visitors' behaviours, which reflect informal heritage creation in spaces that are not yet fully institutionalised, fluctuating between the extraordinary and the ordinary, the sublime and the everyday, and engaging with discourses of risk, hope, and uncertainty, negotiating not only the past but the futures of these sites.

The research I conducted for the Articles I, II, III, and IV also reflects the progressive sequence of this dissertation work, from data collection to further elaborative work concerning the afterlives of participant-generated images and the work of images as cultural agents. These articles show that vernacular nuclear visual culture is a vital part of the dynamics that constitute nuclear cultural heritage.

5 Conclusions

5.1 Participatory Nuclear Visual Culture Re-Evaluated

Figure 40. Namie city in transition. A former private elementary school is currently being demolished. The statue of two pupils still stands at the former entrance. Photograph taken in May 2025 by Veera Ojala.

In this dissertation, I posed a central research question: *"How do participatory practices of nuclear visual culture contribute to the co-creation of nuclear cultural heritage?"* Followed by sub-questions aligned with the themes of each article:

1) *In what ways do different visitor groups perform Chornobyl's heritage through narrative and visual representation?*
2) *How do visitors' spatial strategies perform and communicate the inherited significance of the Chornobyl Exclusion Zone?*

3) *What visual distinctions can be observed in visitors' photographs of the Chornobyl nuclear disaster Zone from 2008, 2013, and 2018, and how have these representations temporally evolved?*

4) *In what ways do the visual narratives of the Chornobyl and Fukushima disaster sites diverge concerning post-nuclear imaginaries?*

This question was analysed through the investigations of four original research articles, *I) Chernobyl Dreams: Investigating Visitors' Storytelling in the Chernobyl Exclusion Zone, II) Co-Constructing Chernobyl: Investigating Visitors' Heritage Meaning-Making through Performativity in the Chernobyl Exclusion Zone, III) Chornobyl Visual Lexicon: Exploring the Visual Framing of Toxic Heritage,* and *IV) Chornobyl and Fukushima Visual Archives: Visitors' Practices of Curatorship of the Nuclear Accident Sites.*

The main research question positions nuclear cultural heritage not as a fixed institutional category but as something continuously produced through the visual and participatory practices of visitors. Across the four articles, the dissertation demonstrates that co-creation operates simultaneously at multiple levels, through narrative engagement, spatial practice, photographic representation, and the circulation of images in digital platforms, and that each of these levels contributes to the ongoing constitution of what nuclear disaster sites mean for contemporary societies. The four sub-questions each illuminate a distinct dimension of this co-creative process, and together they build a cumulative argument about the nature, mechanisms, and cultural significance of participatory nuclear heritage-making.

At the beginning of the dissertation, I posed a question following Mitchell (2005): "What do the images do and want from us in the context of nuclear cultural heritage?" I sought to elevate the participatory picture to analytical depth, enhancing its agency as a device for creating imaginaries, narratives, entangled engagements, and values within the context of nuclear visual culture. These interactive and entangled image practices were brought into analytical attention through indicating and reflecting the medium-specific ways of speaking (Volkmar, 2022). There is an analytical level this dissertation sought to capture, the allure of images and how these imaginaries invite individuals to participate in the making of nuclear cultural heritage in its *visual context.*

Thus, as the title of this dissertation also encourages us to think: *Chornobyl and Fukushima Dreams: Visual Participatory Culture and the Co-creation of Nuclear Disaster Heritage***,** there is a profound participatory and imaginative dimension at play when considering the nuclear heritage-making.

In this dissertation, I applied a generous use of participatory pictures in addition to my own pictures to highlight the main analytical insight: the pictures cannot be reduced to mere objects or representations; instead, they are social artefacts and

communicative devices. Mitchell (1996) would answer the question he posed: *"Pictures want to be seen as complex individuals occupying multiple subject positions and identities*." I sought to valorise the practice of nuclear cultural heritage-making within the domain of nuclear visual culture by utilising this statement as a backdrop and images as cultural agents. Next, I will conclude the findings that answer each of the sub-questions and implications of the findings for the field of nuclear cultural heritage. and visual heritage studies.

Sub-question 1: In what ways do different visitor groups perform Chornobyl's heritage through narrative and visual representation? (Article I)

Article I establishes the foundational argument that heritage at nuclear disaster sites is performed rather than merely consumed. By identifying three distinct visitor categories, spectators on group tours, explorers on private tours, and adventurers on unofficial Stalker tours, the study demonstrates that the Zone does not produce a single, unified heritage narrative but a field of competing and mutually reinforcing storytelling forms. Group tour visitors construct what the article calls *the Tale of Mighty Nature*, engaging with the Zone's exterior surfaces and narrating the disaster through the resilience of the natural world reclaiming abandoned infrastructure. Private tour visitors produce the *Tale of Apocalyptic Afterness*, seeking intimate sensory and material engagement with the interiors of decaying buildings and the artefacts left behind by evacuated residents. Unofficial visitors construct *the Tale of the Mythical Zone*, drawing on cultural references to Tarkovsky, the Strugatsky brothers, and urban exploration subcultures to frame their experience as transgressive, embodied, and transformative.

The significance of these findings for the main research question lies in their demonstration that participatory heritage-making is not a uniform process. Different visitor groups bring different cultural resources, motivations, and spatial strategies to the site, and as a result, they produce different versions of nuclear cultural heritage. None of these versions is simply derivative of institutional or authorised narratives; each represents an active, creative engagement with the Zone's imaginative resources. *The Tale of the Mythical Zone*, in particular, reveals how popular cultural imaginaries circulating far beyond the site itself become incorporated into visitors' heritage performances, demonstrating that nuclear cultural heritage is produced not only at the site but in the wider cultural field through which visitors approach it.

Sub-question 2: How do visitors' spatial strategies perform and communicate the inherited significance of the Chornobyl Exclusion Zone? (Article II)

Article II advances the argument developed in Article I by demonstrating that heritage performance is not only narrative but deeply spatial. The three performative patterns identified, *conformity, enactment, and contestation*, correspond to the three visitor categories and reveal how the physical movement of bodies through the Zone's landscape constitutes a form of heritage meaning-making in its own right.

Spectators practise conformity, following pre-determined routes, maintaining safe distances, and conforming to the authorised spatial logic of the official tour. Explorers practise enactment, negotiating between official frameworks and personal desires for deeper material engagement, entering buildings, photographing artefacts, and shaping their own sensory choreographies. Adventurers practise contestation, physically transgressing the Zone's official boundaries, moving at night, and producing an alternative spatial experience that challenges both the safety regulations and the interpretive authority of official tourism.

The contribution of this finding to the main research question is twofold. First, it demonstrates that spatial practice is itself a form of participatory heritage production, and that how visitors move through the Zone is as constitutive of its cultural significance as what they narrate or photograph. Second, it reveals that the spectrum from conformity to contestation is not simply a matter of individual preference but reflects broader tensions between authorised and unauthorised heritage discourse, between institutional and vernacular understandings of what the Zone is and what it means. The tourismscape of the Zone is collectively produced through the interplay of all three spatial patterns, meaning that even the most transgressive unofficial visitor practices contribute, through their influence on visual culture, social media, and the expectations of subsequent visitors, to the co-creation of nuclear cultural heritage.

Sub-question 3: What visual distinctions can be observed in visitors' photographs from 2008, 2013, and 2018, and how have these representations temporally evolved? (Article III)

Article III provides the longitudinal empirical foundation for understanding how participatory visual culture at the CEZ has developed over time, and in doing so, it reveals the mechanisms through which a shared visual lexicon of nuclear heritage is collectively produced and stabilised. The four major semiotic shifts identified, the declining symbolic significance of the nuclear power plant, the shift from exterior to interior photography, increasing compositional complexity, and heightened image modality, are not merely aesthetic changes but reflect the evolving interplay between technological development, tourism developments, urban exploration subcultures, and the emergence of digital participatory culture as the primary arena of nuclear heritage circulation.

The decline of the power plant as a dominant motif reflects the transformation of the Zone from a site of documentary witness to one of creative and imaginative engagement, as the establishment of the NSC physically altered the landscape and removed one of its most symbolically charged elements. The shift toward interiors reflects both technological advancement, cameras capable of capturing low-light conditions, and the influence of urban exploration communities whose aesthetic priorities favour *personal, expressive engagement with decay and materiality over*

informational documentation. The increase in compositional complexity and image modality reveals that by 2018, visitors were no longer primarily recording the Zone but curating it, staging artefacts, manipulating images through post-processing, and producing photographs designed to communicate *subjective experience and emotional truth rather than objective reality.*

For the main research question, Article III makes a contribution by demonstrating that participatory visual culture at the Zone operates as a self-reinforcing system of signification. Successive waves of visitor-generated imagery function as intertextual reference points, consolidating visual conventions, circulating recognisable motifs, and progressively refining the curatorial vocabulary through which the Zone's heritage is articulated and reproduced. This means that nuclear cultural heritage is not simply co-created by individual visitors acting independently, but through an ongoing collective visual conversation in which prior images shape present practices and present practices anticipate future circulation.

Sub-question 4: In what ways do the visual narratives of the Chornobyl and Fukushima disaster sites diverge concerning post-nuclear imaginaries? (Article IV)

Article IV extends the dissertation's argument to a comparative register, revealing that the relationship between participatory visual culture and nuclear cultural heritage is not universal but deeply shaped by the specific temporal, political, and semiotic conditions of each site. The central finding, that Chornobyl operates through *sensory coding and a temporally suspended imaginary of technological defeat,* while Fukushima operates through *abstract coding and a future-oriented imaginary of recovery and normalisation*, demonstrates that participatory nuclear heritage-making takes fundamentally different forms depending on the material-discursive conditions each landscape makes available.

At Chornobyl, the unresolved temporality of the disaster, its unknown consequences, its ongoing contamination, its refusal of institutional closure, is the condition that sustains its myth and enables its participatory visual culture to function as an endlessly generative system. The volume and momentum of digital heritage communities around the Zone reflect the cultural productivity of its open temporal horizon. At Fukushima, by contrast, the state-managed trajectory toward normalisation progressively erases the semiotic resources, ruins, artefacts, and abandoned infrastructure, through which disaster can be narrated photographically, producing a fundamentally different and more contested heritage landscape in which hope is simultaneously a genuine aspiration of displaced communities and a governmental narrative that works to domesticate and contain the memory of disaster.

The significance of this comparative finding for the main research question is that it reveals the limits as well as the possibilities of participatory nuclear heritage-making. Where the conditions of a site, its temporality, its visual environment, and

its institutional framing, enable rich participatory engagement, as at Chornobyl, a vernacular heritage culture emerges. Where those conditions are systematically constrained or erased, as at Fukushima, participatory culture struggles to develop the semiotic resources needed to sustain a comparable visual heritage discourse. These findings demonstrate that nuclear heritage management is context-dependent, shaped by socio-political factors. Decisions regarding decontamination, demolition, and framing of recovery directly shape the forms of participatory heritage-making that are possible, thereby influencing the cultural legacies that nuclear disaster sites contribute to collective memory.

Taken together, the four sub-questions and their corresponding articles build a cumulative answer to the main research question. Participatory practices of nuclear visual culture contribute to the co-creation of nuclear cultural heritage through four interconnected mechanisms. *First, through narrative performance*, visitors actively produce competing and complementary versions of what nuclear disaster sites mean, drawing on cultural resources that extend far beyond the sites themselves. *Second, through spatial practice*, the physical movement of bodies through nuclear landscapes constitutes a form of heritage meaning-making that both reflects and challenges the authority of institutional heritage discourse. *Third, through the longitudinal evolution of participatory visual culture*, a shared visual lexicon emerges that stabilises certain semiotic conventions while remaining open to transformation through technological change, subculture influence, and the changing demographics of visitation. *Fourth, through the comparative divergence of Chornobyl and Fukushima's visual cultures*, this dissertation demonstrates that co-creation is consistently influenced by the temporal and political conditions present at each site. Consequently, participatory nuclear heritage-making depends equally on the affordances of landscapes and the contributions of visitors. Prior to outlining suggestions for future research, the implications of these findings for the field of nuclear heritage research are summarised.

As I proposed in Articles I, III, and IV, the interpretation and engagement with *the materiality of the nuclear site cannot be reduced to mere visual representations.* Thus, the articles expand the concept of NCH beyond material remains. The imagery of the broader nuclear visual culture is the communicative domain where complex entanglements of the significance of the site and communication of experiences, belonging, and identities find their expression.

As Carpenter (2016) notes, techno-scientific accounts alone cannot fully grapple with nuclear culture. Art, visual culture, sound work, in addition to archival and curatorial practises, bring other registers: sensory, material, affective, and temporal (ibid.). Varied vernacular and high cultural responses assist in uncovering, representing, and critiquing the histories of radioactivity, nuclear technology, and their cultural afterlives. Adding to the discussion the co-creation of nuclear visual

culture by *establishing participatory culture as a constitutive force in nuclear heritage-making*, findings across Articles I-IV reveal that participatory digital culture is not merely a medium for communicating nuclear heritage but an active force in constituting it.

Outside official heritage frameworks, non-institutional actors continuously archive, curate, and transmit NCH. Digital tools and social media have accelerated the co-creation and circulation of nuclear imagery, and it is within these contingent spaces (Thouki and Skrede 2025) that nuclear objects are transformed from technological artefacts into cultural symbols. The Articles I-IV indicate that this vernacular heritage-making deserves critical attention in heritage studies, not as a supplement to AHD and authoritative representation, but as a parallel and equally powerful system of production of significance. Participatory photograph projects establish communicative discursive spaces, and *images are the catalysts* of broader nuclear heritage processes.

The analytical focus was on the *public's role* in performing, interpreting, and challenging heritage resources both imaginatively and materially, and the photograph as *emergent relationality*. As Sterling (2021, 125) indicates, heritage photography cannot be reduced to a specific genre or aesthetic, but as a constantly moving ecosystem of production, circulation, and signification, spatially distributed and inherently non-linear. I explored the digital participatory community through their image practices as actors that co-create the communicative public sphere, which is directly linked to the imagination of nuclear visual culture, and the signification of nuclear heritage, particularly in relation to the creation of visions around risk and recovery.

The third implication for NCH is *the identity work embedded in heritage visitation.* Throughout this dissertation, I adhered to the performative understanding of heritage as living, participatory, and contested, negotiated through both official and unofficial boundaries. In the works of Articles I-IV, the complexity and entanglement of the heritage (Gordon 2008; Koskinen-Koivisto et al. 2024; Smith 2021) reveal that visitors to nuclear heritage sites are not primarily engaged in learning about the past; they are engaged in constructing themselves as particular kinds of subjects. This decentralised authorship reveals how public performances actively shape nuclear cultural heritage, not as static memory, but as *a dynamic, networked process of meaning-making.*

In the paradigm change of cultural heritage, the significance of the cultural heritage community is elevated on a new level (Koskinen-Koivisto et al. 2024; Lähdesmäki et al. 2019; Sivula 2022; Smith 2021). Through their performative practices of co-creating the landscape, the practitioners of digital participatory culture exert an influence on the overall dynamics of what constitutes heritage (Immonen and Sivula 2025). Across the four articles in this research, I elaborated on the material-discursive practices of authorised and unauthorised heritage-making, providing a nuanced

understanding of the *practices of micro-politics* as a bottom-up heritage discourse and as dynamics that emerge at heritage sites and inform each other. The contribution of this dissertation was to focus on these dynamics co-created by the cultural heritage community, and to alleviate these dynamics as cultural heritage *per se*. As a result, it is cultural heritage as expressed as *agency through the dynamics of participants' co-creation*, which this dissertation could elaborate on further.

This contributes to the fourth implication for NCH by c*hallenging the distinction between authorised and unauthorised heritage.* The empirical context developed most explicitly in Articles I and II posits that legal and illegal tourism, as well as official and unofficial heritage practices, are better conceptualised as a spectrum of mutually constitutive behaviours rather than as opposing categories (Banaszkiewicz 2022). Individuals who enter the Zone without authorisation, urban explorers who document its interiors, and digital communities who disseminate these images all participate in the production of NCH. Heritage management frameworks that disregard these practices are analytically insufficient, as unofficial practices often generate the imaginaries and visual discourses that underpin the site's broader cultural significance and visitor appeal.

The fifth implication for the NCH is the *demonstration that nuclear heritage is temporally plural and politically contested.* Article IV indicates that nuclear heritage sites do not share a single temporal logic. Chornobyl's unresolved, open-ended temporality sustains a particular kind of cultural productivity, the myth of the uncontrollable atom, the post-apocalyptic imaginary, the melancholic hope embedded in ruin aesthetics, while Fukushima's administratively managed trajectory toward closure generates a fundamentally different and contested relationship between nuclear memory, recovery, and hope. These findings (Figure 41) highlight the dynamics of NCH and nuclear visual studies from the vernacular perspective.

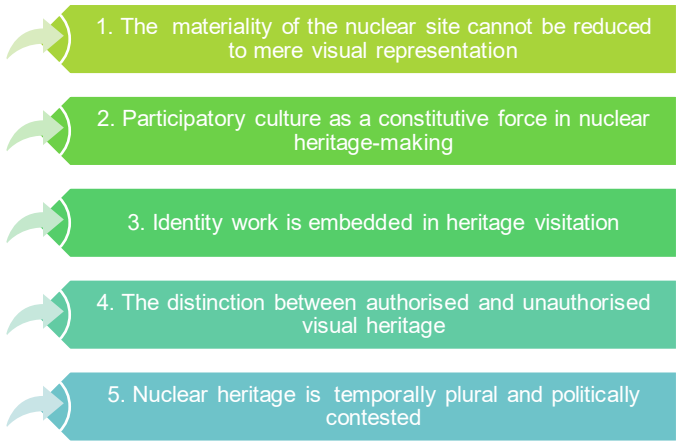


Figure 41. The significance of the findings for nuclear cultural heritage.

The interpretation of nuclear technology in its various material and immaterial forms through marking practices in nuclear visual cultures is not separate from the ongoing discussion of how to semiotically protect nuclear waste repositories, either (Holtorf and Högberg 2015; Keating and Storm 2023). Thus, these activities cannot be ignored when considering this system of communication in the broader field of techno-social decision-making and how these activities influence and translate into negotiations and understanding of current energy political horizons. The *nuclear as an imaginary and semiotic practice* is the crucial analytical point. The broader significance of this argument is that nuclear cultural heritage is inseparable from (nuclear) heritage futures (Harrison 2020; Holtorf and Högberg 2021). The images visitors produce and circulate, the stories they tell, and the spatial practices they enact are not merely records of the past but active contributions to how societies imagine, assess, and respond to nuclear risk in the present and future.

Ultimately, this dissertation argues that participatory visual culture is not a peripheral or supplementary dimension of nuclear cultural heritage; it is one of its primary constitutive forces, and one whose significance extends beyond the sites themselves into broader societal negotiations of nuclear risk, memory, and the imaginaries through which humanity continues to reckon with the atomic age, making participatory visual culture a matter of genuine public and political consequence.

5.2 Suggestions for Further Research

Future studies concerning visual nuclear heritage studies benefit from the comparative, cross-platform, and bottom-up approach sketched in this dissertation. A critical question remains: "What purposes are the representations being made, and what do they say about broader responses to the nuclear accidents?" Future research should develop ethical protocols for the elicitation, publication, and archiving of images from hazardous or politically sensitive sites.

As the dissertation already paved the way for future intersectional studies, these categories could be made explicit in future studies by extending participant inclusion via photo-elicitation and visuals produced by guides, residents, NGO advocates, and journalists to explore how situated practices intersect or conflict in the field. As the Zone remains a site of vulnerability in addition to other NPPs in Ukraine under Russian full-scale invasion, utilisation of the experiences of Ukrainian experts provides important possibilities for increasing understanding of how the discursive spaces around threats and risk are created and challenged (Ojala 2024).

Museological translation and participatory visuality could be developed further, co-production of exhibition modules or digital archives with displaying participatory images could be used as important media for the exploration of contemporary

nuclear visual culture. This would increase knowledge of how participatory visual heritage can be ethically and collaboratively curated, extending public engagement work.

Foremost, this dissertation has demonstrated the significance of understanding visual cultures and the demand for critical visual literacy as an assessment. There are possible future directions in this field as well, by strengthening the field's methodological base and building a comparative visual heritage dataset. Across these dimensions, nuclear heritage sites oscillate between abandonment, sublimity, and normalisation. Understanding how these visual registers circulate across platforms and publics is crucial for grasping how nuclear modernity is remembered, curated, and contested.

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