

Risk Assessments of Natural Hazards in Refugee Camp Planning in Greece. Challenges and Recommended Actions.

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Abstract

The rapid increase of asylum-seekers in 2015 overwhelmed the Greek reception system and led to the creation of numerous refugee camps throughout the country. The Sphere Minimum Standards provide globally acknowledged guidance to design and manage these facilities. They designate risk assessments as an essential tool to guarantee a safe environment for Persons of Concern. Yet, exposure to natural hazards is a prevalent issue in Greek refugee camps, and living conditions are widely criticized as precarious. No academic research previously explored how risks from natural hazards are assessed or managed in refugee camps in Greece, highlighting a major research gap, specifically in the field of disaster risk management. After confirming the existence of risk assessments in two case study sites, the thesis investigates which challenges impede the assessment process and identifies potential pathways to address them. An inductive research strategy is applied that uses a qualitative case study approach and triangulates semi-structured interviews with a literature scoping. The identified challenges are grouped into eight categories: awareness, political attitude, time, capacities, inflexibility, funding, lack of Standard Operating Procedures (SOPs), and information management. Five potential pathways are recommended to address these challenges: a Risk Management Focal Point, capacity development, flexible funding, SOPs, and information sharing mechanisms. The thesis highlights that power structures are the fundamental root cause shaping all aspects of humanitarian response operations in Greek refugee camps, and that efforts to address the identified challenges need to go beyond the operational level, short-term objectives, and fragmented modus operandi of all stakeholders involved in camp management. The thesis concludes with suggestions for future research for which it may act as a starting point.

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Summary

The number of forcibly displaced people due to conflict is increasing, reaching a record 100 million in the first half of 2022¹ (UNHCR, 2022a, 2022c). In Europe, this trend became particularly visible in 2015, when war in Syria and insecurity in Afghanistan and Iraq led to a rapid increase of asylum-seekers arriving in the Mediterranean countries, predominantly Greece (de Radigues & Gammarelli, 2016:8; European Commission, 2021; Weber, 2016:20). At the same time, the Greek administrative system still grappled with the effects of the 2008 economic crisis, resulting in significant resource and capacity gaps in the country's reception system (UNHCR, 2009:8-10; Weber, 2016:21). Despite support from the European Union, United Nations agencies, non-governmental organizations, and volunteer groups, the living conditions in Greek refugee camps were soon criticized as unsafe and disgraceful (IRC, 2020:7,21; Karagiannopoulou et al., 2020:41; Oxfam International & GCR, 2021:2).

Various humanitarian minimum standards provide globally acknowledged guidance on how to guarantee a safe and dignified environment in refugee camp planning. Risk assessments are an integral part of these standards with the objective to avoid further harm by reducing vulnerability and hazard exposure (CCCM Cluster, 2021:35-36; EASO, 2016:19,47; IOM et al., 2015:172; Sphere Association, 2018b:59,275; UNHCR, 2018b:4, 2021e:5). Yet, risk management practices in refugee camps, in particular relating to risk assessments and natural hazards, have not previously been covered by academic literature in a European context due to the recency of current camps (Paul, 2021:222), highlighting a major research gap for the field of disaster risk management (DRM). Moreover, as the majority of academic sources informing the results and discussion originate from sociology, political science, or migration studies that do not consider technical DRM frameworks, the thesis found that a transdisciplinary approach to exploring risk management practices is lacking. To address these gaps, the thesis combines knowledge from the respective academic fields to explore the implementation of risk assessments in the dynamic and complex context of contemporary humanitarian response operations in Greek refugee camps. More specifically, the thesis identified challenges that currently impede risk assessments, focusing on natural hazards. Subsequently, pathways with the potential to address these challenges were recommended. Due to the lack of previous studies, an inductive research strategy was selected that examined two qualitative case studies. To enhance the credibility of the findings, 12 semi-structured interviews were triangulated with

¹ Including eight million due to the conflict in Ukraine (UNHCR, 2022c).

a literature scoping. Grey literature sources had to be included due to the gap in academic publications.

The thesis identified numerous challenges that can be grouped into eight categories: awareness, political attitude, time, capacities, inflexibility, funding, lack of Standard Operating Procedures (SOPs), and information management. Based on these challenges, five potential pathways were recommended: the creation of a Risk Management Focal Point, capacity development, flexible funding, the development of SOPs, and information sharing mechanisms. The findings highlight that the majority of challenges and recommended pathways are applicable to the wider humanitarian context. Moreover, the findings indicate that the Pressure and Release model by Wisner et al. (2004:51) is applicable to the case study context. The model describes risk as emerging from the combination of natural hazards and vulnerability, with the latter following the trajectory of root causes > dynamic pressures > unsafe conditions (ibid). In this context, unsafe conditions refer to the inadequate living conditions that result in exposure to natural hazards in the case study sites. While the suggestions brought forth in the interviews and literature primarily address the more tangible middle stage of dynamic pressures (e.g., lacking capacities), the findings highlight that power structures and the low priority conceded to refugees and asylum-seekers are the fundamental root causes that need to be addressed to facilitate sustainable change. Moreover, the thesis emphasizes that a short-term and fragmented planning approach by Greek authorities and donor agencies is a major challenge that undermines risk management in the examined refugee camps. Eventually, the thesis concluded with suggestions for future research, highlighting (i) the need to confirm and expand the findings by exploring additional case studies throughout Europe, (ii) incorporating the perspectives of more diverse stakeholders, (iii) interrelating the findings with power structures and humanitarian operating principles on a strategic level, and (iv) exploring the utility and adaptability of risk assessment frameworks to dynamic refugee camp contexts.

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List of Abbreviations

AFP	-	Agence France-Presse
ALARP	-	As low as reasonably practicable
ANSA	-	Agenzia Nazionale Stampa Associata
CADRI	-	Capacity for Disaster Reduction Initiative
CCCM	-	Camp Coordination and Camp Management
CMT	-	Camp Management Toolkit
DG ECHO	-	Directorate-General for European Civil Protection and Humanitarian Aid Operations
DPAS	-	Directorate for the Protection of Asylum Seekers
DW	-	Deutsche Welle
DRM	-	Disaster risk management
EASO	-	European Asylum Support Office
ECRE	-	European Council on Refugees and Exiles
EIA	-	Environmental Impact Assessment
EPC	-	European Parliament and Council
EPRS	-	European Parliamentary Research Service
EU	-	European Union
EUAA	-	European Union Agency for Asylum
FRA	-	European Union Agency for Fundamental Rights
GCR	-	Greek Council for Refugees
GSCP	-	General Secretariat for Civil Protection
HLP	-	High-Level Panel on Humanitarian Financing Report to the Secretary-General
HMSs	-	Humanitarian minimum standards
HRW	-	Human Rights Watch
IASC	-	Inter-Agency Standing Committee
IGO	-	Intergovernmental organization
IOM	-	International Organization for Migration
IPCC	-	Intergovernmental Panel on Climate

		Change
IRC	-	International Rescue Committee
ISM	-	Information sharing mechanism
ISO	-	International Organization for Standardization
ISWG	-	Inter-Sector Working Group
LCL	-	Legal Centre Lesbos
M&E	-	Monitoring and evaluation
MEAL	-	Monitoring, evaluation and learning
MSF	-	Médecins sans Frontières
MoH	-	Ministry of Health
Nat-CHAMM	-	National Crisis and Hazard Management Mechanism
NCCBCIA	-	National Coordination Center for Border Control, Immigration and Asylum
NCEH	-	National Center for Environmental Health
NGO	-	Non-governmental organization
NRC	-	Norwegian Refugee Council
PAR	-	Pressure and Release
PoC	-	Person of Concern
RIC	-	Reception and Identification Center
RIS	-	Reception and Identification Service
RMFP	-	Risk Management Focal Point
RQ	-	Research question
RRE	-	Refugee Rights Europe
RSA	-	Refugee Support Aegean
SOP	-	Standard operating procedure
SSCP	-	Safety & Security Community of Practice
SVR	-	Sachverständigenrat für Integration und Migration
SWG	-	Sector Working Group
UDHR	-	Universal Declaration of Human Rights
UN	-	United Nations
UNDRR	-	United Nations Office for Disaster Risk

Reduction

UNHCR	-	United Nations High Commissioner for Refugees
UNICEF	-	United Nations Children's Fund
WASH	-	Water, Sanitation and Hygiene
WFP	-	World Food Programme
WHO	-	World Health Organization

1. Introduction

In 2015, the Syrian Civil War and the unstable security situation in Afghanistan and Iraq resulted in a rapid increase of refugees arriving in Europe. As the European Union (EU) member state that borders Turkey, Greece received the majority. More than 1 million people entered the country between January 2015 and February 2016 (de Radigues & Gammarelli, 2016:8; European Commission, 2021; Weber, 2016:20). Overwhelmed by the number of arrivals and restrained by capacity gaps in the reception system, Greece established a response strategy that is primarily based on refugee camps (European Commission, 2020; Fossvik, 2016; SVR, 2021:15; UNHCR, 2009:8-10; Weber, 2016:20). The largest are the “hotspots” established in cooperation with the EU on the islands bordering Turkey (EPC, 2019; EPRS, 2018:1; Karagiannopoulou et al., 2020:40-41). The vulnerable living conditions in these camps have been criticized by politicians, United Nations (UN) agencies, human rights organizations, and humanitarian organizations (Mavrikos-Adamou, 2019; NRC, 2020; Oxfam International & GCR, 2021:14; RRE, 2018:4; UNHCR, 2017:1).

The protection principle underlying humanitarian minimum standards (HMSs) for refugee camps prescribes that refugees should not be exposed to further harm. Therefore, camp managers are required to consider risks and vulnerabilities in camp planning (Sphere Association, 2018b:11,34). This necessitates multi-hazard risk assessments to inform construction and contingency plans (Ignatova et al., 2020:24,32; UNHCR, 2020c:13) because “*vulnerability and risk assessments are key strategic activities that inform [...] disaster risk management*” (Cardona et al., 2012:91). Addressing risks from natural hazards is a vital aspect of risk assessments, as exposure to them commonly endangers safety in refugee camps (DG ECHO, 2017:7; IOM et al., 2015:99,170; UNHCR, 2015).

The thesis inductively explores how risk assessments account for natural hazards in Greek refugee camps; investigates which challenges impede the assessment process; and which potential pathways could address these challenges. Two case studies are researched through semi-structured interviews. The results are triangulated with a literature scoping to allow for limited generalizations (Blaikie, 2010:83). As “*refugee camps are still a relatively new phenomenon and barely covered by the literature*” (Paul, 2021:222) in a European context, no scientific publication that examines these topics was discovered. This knowledge gap is relevant for academia and practitioners in disaster risk management (DRM) and the humanitarian sector to discover why HMSs are frequently not met in refugee camps, and how efficiently theoretical

frameworks from risk management are put into practice. From an ethical perspective, failing to comply with HMSs endangers the life and health of refugees and asylum-seekers, and risks to displace them again (UNHCR, 2021e:1).

1.1. Purpose & Research Questions

HMSs stipulate refugee camp planning to incorporate risk assessments (cf. chapter 5.3). Yet, the dynamic and unpredictable nature of refugee camps challenges conventional risk assessment frameworks that fail to account for complexity (Wassénus & Crona, 2022:40-41). The thesis aims to identify challenges that are currently impeding risk assessments in Greek refugee camps, and to explore how these challenges could be addressed. To limit the scope, the research focuses on risks emerging from natural hazards, as the literature scoping failed to identify studies that examine them in Greek refugee camps, indicating a striking gap in academic research for this area. The subsequent research questions were developed to address this gap and identify the potential for further research:

RQ1: What are the challenges to carrying out risk assessments for natural hazards in refugee camps in Greece?

RQ2: What are potential pathways to address these challenges?

2. Methodology

2.1. Ontology & Epistemology

Understanding the ontological and epistemological assumptions of the author is vital for interpreting the findings. Ontology describes an individual's perception of reality; epistemology defines how knowledge is created (Creswell, 2013:20,40). The author approaches the thesis from the ontological perspective of cautious realism which states that reality exists independently but is interpreted subjectively (Blaikie, 2010:93). Epistemologically, the author uses a constructionist lens which specifies that knowledge emerges from everyday interpretations of the world. From this perspective, science conceptualizes this knowledge, but the subjectivity of society and scientists determines that findings only represent one possible interpretation of reality (ibid:95). Thus, the author and respondents have their own interpretations of the studied cases, challenges, and potential pathways (Creswell, 2013:25). While the number of interviews and triangulation with literature can analytically reduce the respondent's biases, the author's perspective inevitably influences the results.

2.2. Research Strategy

The thesis applied an inductive approach by identifying and evaluating challenges and potential facilitating pathways for natural hazard risk assessments. From a constructivist perspective, the aim of inductive research is to develop *patterns of meaning* (Creswell, 2013:25). Eventually, these patterns are limitedly generalized. Case study research was chosen as a suitable methodology because Blaikie (2010:83) suggests bounding the data collection method to a specific case. As the research questions also explore and evaluate a practice, evaluation research complements the methodology.

2.2.1. Case Study Research

Case study research examines a spatially and temporally bounded case through detailed description and in-depth data collection. This strategy facilitates deeper understanding of the characteristics and patterns identified in that case (Creswell, 2013:97; Swanborn, 2018). Two case studies were selected to identify trans-contextual patterns and context-specific particularities. This strategy allows for limited generalization which is common in inductive research (Blaikie, 2010:83).

2.2.2. Evaluation Research

The thesis applies evaluation research because it systematically assesses and evaluates a practice which generates information for decision-making (Kellaghan, 2010:150-151) and provides recommendations for improvement (Rubin & Rubin, 2005). In this context, risk assessments for natural hazards are the practice that guide decisions in camp planning, while the research questions address challenges and recommendations.

3. Methods

The thesis utilized primary and secondary data collection methods to increase the credibility of the findings. Initially, literature scoping is applied as a secondary data collection method to identify the relevant concepts and context. Subsequently, semi-structured interviews were conducted as a primary data collection method to provide information for the research questions. The literature scoping informed the development of the interview guide and was used to triangulate the findings from the interviews.

3.1. Literature scoping

A literature scoping precedes case study research to identify available information, adjust the research questions, and establish the most suitable data collection method (Ostrom & Wilhelmsen, 2012:237). The scoping searched Lund University Library search, Google Scholar, ReliefWeb, ResearchGate, and Scopus to identify relevant concepts based on the keywords “risk assessment”, “natural hazard” and “refugee camp planning”. The context and information on risk assessments in Greek refugee camps was established by using the keyword combinations “risk assessment/natural hazard/contingency planning² + refugee camp/Moria/Mavrovouni + Greece”. Additionally, international and Greek legislations were thematically scanned for emergency preparedness and contingency planning in refugee camps. This strategy further identified seven relevant guideline documents prescribing standards in humanitarian operations (cf. chapter 5.3). For all sources, reference tracing was used until no new sources were discovered. When specific themes emerged, a targeted search was conducted.

The literature scoping did not identify scientific articles examining natural hazards, risk assessments for natural hazards, or contingency plans for Greek refugee camps. Instead, academia focuses on mental health, epidemiological risks³, violence, and gender-based violence. Thus, the thesis addresses a significant research gap concerning the management of risks from natural hazards. To bridge this gap, grey literature⁴ was included, and Google added to the search engines. This is in accordance with Benzies et al. (2006:57-58) who point out that grey literature should be included in research when the volume of evidence is low and the contemporary context important. Moreover, grey literature is more up-to-date than academic

² The keyword was chosen because risk assessments are an integral aspect of contingency planning (EASO, 2018:12; Rausand, 2011:540-541) (cf. chapter 4.1.8).

³ In particular relating to Covid-19.

⁴ Commonly defined as sources not published in peer-reviewed academic journals (Rothstein & Hopewell, 2009:104).

research due to the delay until publication of the latter (Pappas & Williams, 2011:229; Rothstein & Hopewell, 2009:104) which is vital given the recency of the context. Thus, grey literature is particularly significant for current case studies and assessing a practice in evaluation research. Transparency and credibility were addressed by only selecting sources from internationally acknowledged organizations/institutions that state author(s) and data collection method.

3.2. Semi-Structured Interviews

In case study research, literature scoping needs to be triangulated with an additional data collection method (Blaikie, 2010:189). Interviews provide in-depth insights into contextual expertise and experiences and are thus a suitable strategy when academic sources are insufficient (Magnusson & Marecek, 2015:35,50). Semi-structured interviews were selected due to their flexibility to explore relevant topics in depth through a mixture of focused and open-ended questions (Adams, 2015:493; Magnusson & Marecek, 2015:62).

Respondents were selected through non-probability sampling (Blaikie, 2010:176; Creswell, 2013:156) and had to fulfill at least one of the following criteria in either case study site: (i) involvement in camp design/construction/management; (ii) participation in an Intersectoral or Sectoral Working Group⁵ (cf. chapter 6.1); or (iii) contribution to the risk assessment and/or contingency planning processes. Potential respondents were identified during the literature scoping, in UNHCR working group documents, on LinkedIn, and through snowball sampling. Out of 60 people, eleven agreed to an interview. One additional respondent agreed to answering the questions via email due to time constraints. The interviews were conducted on Zoom and recorded (if approved). Prior to the interview, the respondents received a consent form and participant information sheet explaining the thesis scope and confidentiality⁶. Evidently, anonymity was a crucial precondition for the thesis. After the establishment of Mavrovouni, Greek authorities passed a ministerial decision that forbids the disclosure of information from inside refugee camps, prohibiting organizations which do not adhere to these rules from entering⁷ (Gordon & Larsen, 2021:432-433). Some potential candidates declined the invitation, citing this reason. Thus, the policy limited the number of interviews.

⁵ See chapter 6.2 for more information. No list of working groups could be found for Mavrovouni; however, the interviews confirmed the preservation of the working group structure after the transition.

⁶ This included confidentiality, anonymity, as well as the rights to refuse any answer, pull back from the interview, and withdraw consent to use the information provided during the interview at any time (based on Magnusson & Marecek, 2015:43).

⁷ To address any ethical concerns, the thesis objectives were explained to each respondent before the interview, informed consent was obtained, and the respondents have the option to withdraw their consent at any time. Moreover, the Directorate of Support for the Reception and Identification Service of the Ministry of Migration

The interview guide (cf. appendix 1) consists of three sections as outlined in Magnusson & Marecek (2015:55-57). The opening section introduces the interviewer and thesis, explains the interview objectives, and clarifies rights, consent, and anonymity. The main section includes three sub-sections: The first clarifies concepts, the second uses focused questions to fathom the respondent's context, and the third uses open-ended questions to explore the respondent's experiences about risk assessments, associated challenges, and improvement suggestions. The closing section provides opportunities for reflecting on the interview and adding information. Questions tailored to the respondents were included if deemed appropriate (Adams, 2015:496; Magnusson & Marecek, 2015:61). Interview recordings were transcribed on Otter.ai. Despite the small number of interviews, their depth produced an information richness that resulted in data saturation.

3.3. Data Analysis

Coding as described by Creswell (2013:180-191) facilitates the identification of patterns and trends by organizing, sorting, and interpreting the data attained during the data collection. It commenced by re-reading the transcribed interviews several times to take memos and inductively identify relevant themes. Interview sections were then ascribed to thematic codes using the NVIVO 12 software. The sources identified during the literature scoping were re-read and targeted searches conducted to complement information derived from the interviews. In accordance with an inductive approach, coding was repeated at the end of the first coding cycle to adjust the information to themes that emerged retrospectively.

and Asylum was approached to describe the nature and scope of the thesis and request participation in an interview. Although they did not participate, they approved of the topic on the grounds that it remains academic. Nonetheless, the identity of the participants remains strictly confidential.

4. Conceptual Framework

4.1. Basic Terminology

The thesis employs various key concepts which have diverging definitions within and between areas of research. This chapter defines the applied concepts to facilitate a clear understanding.

4.1.1. Asylum seeker, refugee, and Person of Concern

Greek authorities differentiate between asylum-seekers and refugees (Bordignon et al., 2016:76; Hellenic Parliament, 2016:24). While refugees are officially recognized to have fled their country of origin because of threats to their safety and human rights (Bordignon et al., 2016:76; UN General Assembly, 1951:6), the request for protection of asylum-seekers has not yet been approved by authorities (UNHCR, n.d.b). As both groups are present in Greek refugee camps, they are referred to as Persons of Concern (PoC) because the term comprises them (ibid).

4.1.2. Refugee camp

The UNHCR (2018a:1) defines camps as “*a form of settlement in which [PoCs] reside and can receive centralised protection, humanitarian assistance, and other services from host governments and other humanitarian actors*”. There are various camp types⁸ (IOM et al., 2015:9). The thesis examines two planned reception centers⁹. Planned camps are purposefully built and provide access to services. Reception centers are temporary facilities hosting PoCs before transferring or deporting them (CCCM Cluster, 2021:5-6; IOM et al., 2015:18).

4.1.3. Hazard

A hazard is a temporally and geographically bounded dormant event with the potential to result in undesired consequences for valuable assets (Rausand, 2011:66; Wisner et al., 2004:103).

⁸ Such as planned and self-settled camps, collective centers, reception/transit centers, and evacuation centers (IOM et al., 2015:9).

⁹ Based on the case study selection in chapter 5.1/appendix 5/6.

4.1.4. Risk

Risk is a debated concept between and within research areas. In risk engineering, it is typically defined as a combination of probabilities/uncertainty¹⁰ and consequences (Aven & Renn, 2009:2; Kaplan & Garrick, 1981:12; Wassénus & Crona, 2022:35-36). DRM adds exposure and vulnerability to the definition (ibid:36-37). What is considered a risk depends on subjective values ascribed to assets (Aven & Renn, 2009:6; Poljanšek et al., 2021:14; Slovic, 2001:19,23). This definition is congruent with the ontological and epistemological assumptions outlined in chapter 2.1.

4.1.5. Complexity

Complexity is an inherent component of risk and uncertainty, as the interactions and interdependencies between individuals and the social/political/technological/natural environment are largely unpredictable (Hill et al., 2013:4). The combination of these factors creates complex systems from which risks emerge (ISO, 2009b:19).

4.1.6. Vulnerability

Vulnerability has varying definitions (Douglas, 2007:285). In this thesis, it refers to “*the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard*” (Wisner et al., 2004:11). Thus, vulnerability needs to be assessed in conjunction with capacity and exposure (Cardona et al., 2012:69,72). The root causes emerge from social, economic, and political processes that interact with natural hazards (Wisner et al., 2004:7). For the vulnerability definition applied by Greek authorities, see appendix 2.

4.1.7. Safety

Safety refers to an acceptable level of risk from an unconscious risk source. In contrast, security refers to an acceptable level of intentional risk (Rausand, 2011:61). Thus, only safety is relevant in the context of natural hazards.

¹⁰ Uncertainty refers to a lack of information or comprehension about events, consequences, or likelihood (ISO, 2009a:2; Karimi & Hüllermeier, 2007:988). There are different types of uncertainty that are relevant for risk assessments (cf. Rausand, 2011:58-59). For natural hazards, uncertainty mostly arises from irregular space-time behavior of natural phenomena and lack or subjectivity of data, particularly for rare events (Hill et al., 2013:4).

4.1.8. Contingency Planning

Contingency planning refers to “a process, in anticipation of potential crises, of developing strategies, arrangements and procedures to address the humanitarian needs of those adversely affected by crises” (Choularton, 2007:3). The development of contingency plans is informed by a preceding risk assessment (EASO, 2018:12; IFRC, 2012:17; Rausand, 2011:540-541). Thus, the literature scoping and interviews included contingency planning to ensure a more holistic coverage of the research topic.

Application of the Conceptual Framework

Understanding the concepts in this chapter is crucial for understanding risk assessments and for framing the results on a wider conceptual level. Equipped with this knowledge, the reader is invited to reflect on the context, findings, and discussion.

4.2. Risk Management

Risk management is a cyclical process that includes hazard identification, risk analysis, and risk treatment¹¹ to protect valuable assets¹² (ISO, 2009a:7; Rausand, 2011:10). Consultation with stakeholders and dissemination of the results are crucial elements throughout the process (ISO, 2009a:vii; United Nations, 2015:15). In refugee camps, natural hazard risk assessments should inform decisions on site suitability, layout, infrastructure development, shelter type/material, and contingency plans (EASO, 2018:12-13; IFRC, 2012:13; IOM et al., 2015:103-104; Sphere Association, 2018b:256-257).

There is no uniformly accepted framework for risk assessment and management, as they are applied in different sectors (cf. Ostrom & Wilhelmsen, 2012). The International Organization for Standardization (ISO) (2009a; 2009b) provides the risk management framework for the thesis (cf. figure 1) as it is commonly cited by both academic and grey literature. Moreover, EU agencies utilize this framework (Poljanšek et al., 2021:29).

¹¹ Also named risk reduction or risk control.

¹² Which may be anything deemed valuable, the most common being life, health, the environment, economic assets, or services (Aven & Wiley, 2015:29; Rausand, 2011:41).

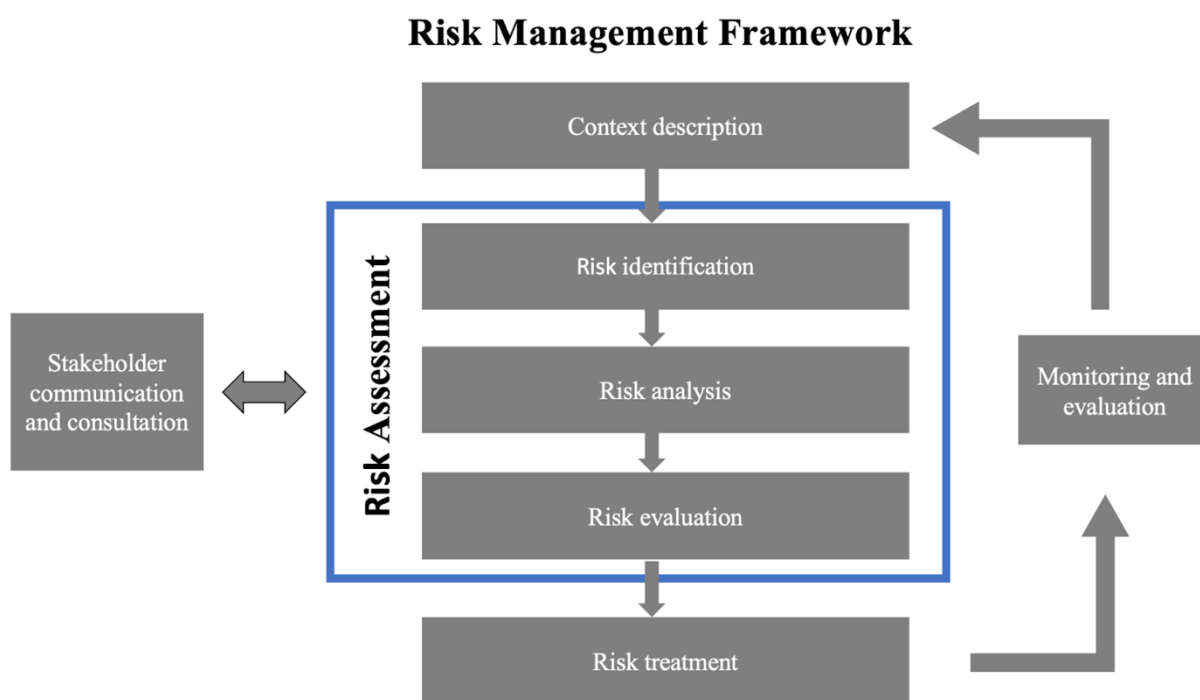


Figure 1: Risk Management Framework as outlined in ISO (2009a:vii).

4.2.1. Risk Assessment

Proactive risk management is enabled through risk assessments (Poljanšek et al., 2021:17,19,39). According to the selected framework, risk assessments comprise risk identification, analysis, and evaluation of potential consequences to inform risk treatment options (Aven & Renn, 2009:9; ISO, 2009a:vii,4; Johansen & Rausand, 2014:388). To account for complexity, risk assessments should be multi-hazard and multi-sectoral. Valuable assets need to be identified prior to the assessment (Cardona et al., 2012:91; Poljanšek et al., 2021:27). As complexity and uncertainty can make risk assessments unrealistically extensive, it requires analytical boundaries (Aven & Wiley, 2015:29,34-35). As individuals decide on these boundaries, they are intrinsically subjective (Cornell & Jackson, 2013:514). This chapter briefly summarizes each step of the risk assessment process. For more detailed information, see appendix 3.

Context Description

Although not officially part of the risk assessment, the context description is a vital precondition (ISO, 2009a:vii; UNHCR, n.d.a:7). It produces substantial data (cf. appendix 4) that is used for the identification of valuable assets, relevant hazards¹³ and their root causes, exposure,

¹³ Also referred to as risk sources or initiating events (Aven & Wiley, 2015:38; ISO, 2009a:4).

population needs and vulnerabilities, potential consequences, and applicable evaluation criteria (Aven & Wiley, 2015:39; IOM et al., 2015:125; Poljanšek et al., 2021:29).

Risk Identification

This step establishes a risk catalog by combining vulnerabilities and capacities of assets with the exposure to hazards (Cedergren & Hassel, 2020:26; Douglas, 2007:283; SSCP, 2014:4). The catalog should also consider potential risks emerging from cascading effects, cumulation, interdependency, and camp activities (Howden, 2020b:64; ISO, 2009a:17-18; Sphere Association, 2018b:39). Then, relevant risks are identified to generate scenarios¹⁴ (ISO, 2009b:13; Rausand, 2011:32,540).

Risk analysis

Risk analyses identify risk levels¹⁵ based on the potential consequences, likelihoods/frequencies, and uncertainties (ISO, 2009a:18; Ostrom & Wilhelmsen, 2012:240; Poljanšek et al., 2021:27,29; Rausand, 2011:8,118,135). There are various analysis methods (cf. Aven & Wiley, 2015:55-83)¹⁶, however, discussing them goes beyond the thesis scope.

Risk Evaluation

This step compares the analysis results with risk acceptance criteria to identify risks requiring treatment (ISO, 2009a:6,18; Rausand, 2011:133). The criteria typically take costs and benefits of risks and treatment options into account (Garrick & Kaplan, 1981:24).

¹⁴ A scenario is a “*set of informed assumptions about a situation that may require humanitarian action*” (Choularton, 2007:13). When disproportionately many risks emerge, representative scenarios can be developed (ISO, 2009b:13; Rausand, 2011:32,540)

¹⁵ Risk can be expressed through individual or societal risk. The former describes the exposure of a hypothetical individual to all risks over a period of time. The latter combines individual risk with the exposed number of people (Rausand, 2011:79).

¹⁶ The authors outline the following methods that can be applied for DRM in a refugee camp context: Coarse risk analysis, Structured What-If Technique (SWIFT), Fault tree analysis, Event tree analysis, Bayesian networks, Monte Carlo simulation.

5. Background

5.1. Case Study Selection

To identify challenges (RQ1) and potential pathways (RQ2), two case studies were selected, as this number was deemed realistic within a Master thesis scope. Following Creswell (2013:97), the thorough analysis of bounded cases allows for the inductive identification of applicable patterns and trends that can be used as a starting point for generalization through additional case studies. After compiling a list of existing refugee camps in Greece (cf. appendix 5), the two most suitable cases were selected based on three criteria: (1) unsafe housing conditions, (2) legal basis, and (3) exposure to natural hazards.

Unsafe Housing Conditions

Tents and makeshift shelters are categorized as unsafe housing conditions as they have a higher exposure rate to most natural hazards¹⁷ (IRC, 2020:21). Housing conditions in eleven camps meet this criterion (cf. appendix 5). Generally, conditions on the Aegean Islands are worse than in mainland camps (UNHCR, 2019a:1-2; 2021a:1) which is congruent to the high relative quantity of island camps on the list.

Legal Basis

The second criterion removed camps which had not received a legal confirmation from the Ministries of Economy and Migration Policy during construction, as such camps lacked official management for several months (Mouzourakis et al., 2019:20; RSA, 2018b). This makes them inadequate options for examining a planned implementation (i.e., risk assessments). After applying the criterion, the Reception and Identification Centers (RICs) Mavrovouni, Moria, Vathy, and Vial remained (Mouzourakis et al., 2019:20).

Exposure to Natural Hazards

For the final selection criterion, natural hazards were identified for the remaining sites which might result, or previously resulted, in harmful consequences for PoCs. The results are presented in appendix 6. The majority is congruent to the natural hazards of highest concern identified in the national risk assessment and listed in the General Civil Protection Plan *Xenokrates*¹⁸ (cf. appendix 7) (GSCP, n.d.; ΕΛΛΗΝΙΚΗΣ ΔΗΜΟΚΡΑΤΙΑΣ, 2003:20-22).

¹⁷ Particularly of meteorological nature (cf. table A3-A5).

¹⁸ Meteorological hazards, floods, landslides, earthquakes, volcanoes, and forest fires (GSCP, n.d.; ΕΛΛΗΝΙΚΗΣ ΔΗΜΟΚΡΑΤΙΑΣ, 2003:20-22).

As the information availability was significantly higher for Moria (18 sources) and Mavrovouni (27 sources) than for Vathy and Vial (nine sources each), the former two were selected as case study sites.



Figure 2: Location of Moria and Mavrovouni on Lesvos (Modified from Google Maps, 2022).

The destruction of Moria in September 2020 (cf. chapter 5.2.1) does not impact its suitability as a case study. The objective of case study research is to identify patterns and trends that may be generally applicable to the field (Blaikie, 2010:83; Creswell, 2013:97). It was assumed that the patterns and trends concerning risk assessments in camp planning are not altered by an unexpected closure or destruction of camps at a later stage, so that identified challenges and recommendations remain contemporary.

5.2. Case Study Description

5.2.1. Moria

Moria was an RIC on the Aegean Island of Lesbos¹⁹ that was destroyed by fire in September 2020 (Pallister-Wilkins et al., 2021:87). It was constructed on an abandoned military base as a regular registration center for asylum-seekers crossing over from Turkey in 2013 (McElvaney, 2018; Pallister-Wilkins et al., 2021:21,73; Pazianou, 2018). Due to the rapid increase of arrivals in 2015 (cf. chapter 1), it was transformed into an official RIC under the European hotspot policy (cf. appendix 7) between summer 2015 and March 2016 (Pallister-Wilkins et al., 2021:21; UNHCR, 2019b). The Ministry of Migration and Asylum is the national authority overseeing the RICs (ibid). In Moria, the Reception and Identification Service (RIS), military, police, and EU agencies managed the site in cooperation with NGOs and volunteer groups (Gisti, 2016:17; Jauhiainen, 2017:10; UNHCR, 2019b).

Moria was criticized for unsafe living conditions that violated HMSs and contributed to the vulnerability of PoCs (Oxfam International & GCR, 2021:14; Pallister-Wilkins et al., 2021:59). One frequently mentioned reason is overcrowding. The RIC initially provided space for 2,840 people, but in February 2020, it hosted 19,584²⁰ (NCCBCIA, 2020a). One reason was its original function as a transit center from which asylum seekers would depart after registration (Gordon & Larsen, 2021:423; Pallister-Wilkins, 2020:74). However, the geographic restrictions (cf. appendix 7) introduced under the EU-Turkey Statement in March 2016 prohibited asylum-seekers from leaving the island (Gordon & Larsen, 2021:423-424; Pallister-Wilkins, 2020:74), forcing some to remain for years (Gordon & Larsen, 2021:424) which gradually exacerbated overcrowding (GCR, 2020; IRC, 2020:5; Karagiannopoulou et al., 2020:24).

¹⁹ For a description of Lesbos, see appendix 8.

²⁰ 590% overcrowding



Figure 3: Moria in May 2020. The red outline shows the original RIC (Modified from Google Earth in Fettouche, 2020).

Therefore, the camp expanded into the adjacent olive groves (HRW, 2018; RRE, 2018:36; UNHCR, 2018a:2). This area is inadequate for shelter because the hills are mostly private property, the slope gradient is too steep for construction, and there are nearly no service facilities. NGOs were not permitted to enter the area, while police officers refused to patrol it (Pallister-Wilkins, 2020:72,74; Pallister-Wilkins et al., 2021:74).

Exposure to natural hazards was exacerbated by unsafe housing conditions. After the camp management ran out of prefabricated tents, arrivals bought camping tents or constructed shelter from makeshift materials²¹. Roughly 75% of PoCs lived in tents or makeshift shelters by January 2020 (Jauhiainen, 2017:31; Oxfam International, 2019:5,7-8; RSA, 2020).

²¹ Such as blankets, branches, or ponchos. At a later stage, the most vulnerable PoCs were accommodated in IKEA kit houses (walls, roof, door, window) (Jauhiainen, 2017:31; Oxfam International, 2019:5,7-8; Pallister-Wilkins, 2020:74-75; RSA, 2020).



Figure 4: Slope gradient in the olive grove, pluvial erosion channels, and open fire for heating (RSA, 2020).

Deteriorating living conditions in winter were especially challenging because tents did not provide sufficient protection from the weather (Oxfam International, 2019:7; Pazianou, 2018). Water flowing down the hill posed a flood risk, and a child reportedly drowned under a tent (RRE, 2018:10). In 2017, a cold spell resulted in the death of three camp residents (Papadopoulos, 2017; Rielly, 2020), and five people died of carbon monoxide poisoning in November 2016 due to makeshift heating implements (McElvaney, 2018; Oxfam International, 2019:8; Pallister-Wilkins, 2020:77). Reportedly, 6% of PoCs experienced the death of another resident due to cold weather (RRE, 2018:10).

The camp and parts of the olive groves were destroyed by fire on the 8th and 9th of September 2020, displacing more than 12,000 people (Oxfam International & GCR, 2020:1; Pallister-Wilkins et al., 2021:87; Papadimitriou, 2021).

5.2.2. Mavrovouni

Mavrovouni²² is an RIC that was constructed as a temporary emergency response measure in September and October 2020 after the destruction of Moria (LCL, 2021; Pallister-Wilkins et al., 2021:21,90). 8,000 PoCs were moved to Mavrovouni (Oxfam International & GCR, 2020:1; Papadimitriou, 2021) which has an accommodation capacity of 10,000 (Pallister-Wilkins et al., 2021:89). Authorities initially planned to relocate all residents by Easter 2021 (Oxfam International & GCR, 2020:3). However, around 1,550 remain as of April 2022²³.



Figure 5: Site layout of Mavrovouni (Maxar Technologies, Google Earth, 2020 in HRW, 2020)

The military and NGOs directed the construction at the behest of the Ministry of Migration and Asylum (Karagiannopoulou et al., 2020:41; Oxfam International & GCR, 2020:3; Pallister-Wilkins et al., 2021:89; UNHCR, 2020a). The RIS runs the camp in coordination with UNHCR, EU agencies, and NGOs (UNHCR, 2021a:1). Mavrovouni was constructed on a former military shooting range²⁴ on the coast (Karagiannopoulou et al., 2020:41; Oxfam International & GCR, 2020:3; Pallister-Wilkins et al., 2021:89).

²² Also known as Kara Tepe. However, the same name refers to a former municipality-run accommodation program (Pallister-Wilkins et al., 2021:22) and will not be used further to avoid confusion.

²³ Information provided during the interviews.

²⁴ Before construction, the army had to remove unexploded ammunition, grenades, and landmines (Karagiannopoulou et al., 2020:41; Oxfam International & GCR, 2020:1). Nonetheless, residents still discover

The camp is divided into four zones (cf. figure 5). Those considered outside of the official asylum procedure²⁵ are hosted in tents and Rubb Halls²⁶ in the green zone. This is the most remote area without escape routes. Those classified as vulnerable are accommodated in the blue zone in tents or ISO box containers. However, the zone is too small to host all residents classified as vulnerable (cf. appendix 2). Single men live in Rubb Halls in the yellow zone. The red zone is unspecified and hosts all types of PoCs (LCL, 2021).



Figure 6: Zones in Mavrovouni (LCL, 2021)

Like Moria, living conditions in Mavrovouni are reportedly below the Sphere Minimum Standards (InfoMigrants & dpa, 2021). Located between hills and the sea, the camp is regularly flooded²⁷ (HRW, 2020; INTERSOS, 2020; Pallister-Wilkins et al., 2021:91; Watershed e.V., 2020) and exposed to strong winds (IRC, 2020:9; LCL, 2022:9). Exposure to floods was only

unexploded shells (HRW, 2020). This is irreconcilable with HMSs outlined in the Camp Management Toolkit (cf. chapter 5.3) which specify that locations “close to risks of landmines and other explosives” are to be avoided (IOM et al., 2015:102).

²⁵ Rejected applicants and recognized refugees

²⁶ Marquee-like tents constructed with polyester fabric, accommodating 80 - 100 people in makeshift compartments. They are also used for single men and rejected families (LCL, 2022:9).

²⁷ Rainwater drains off the hills and accumulates in the plain below.

eliminated after the reduction of PoCs allowed the relocation of shelter from the beach to higher ground²⁸. Furthermore, Mavrovouni is criticized for lead contamination due to its location on a former military shooting range (UNHCR, 2021a:2). This is especially of concern during periods of high dust generation due to winds (HRW, 2020, 2021a; LCL, 2021)²⁹.

Although the Greek authorities transferred responsibility to winter-proof the camp to the UNHCR³⁰ (UNHCR, 2021b:1), freezing temperatures in combination with a lack of heating, rainfall, and strong winds remain problematic (Maud, 2021:1; Pallister-Wilkins et al., 2021:91; Rielly, 2021; UNHCR, 2021a:1).



Figure 7: Flooding of tents (InfoMigrants & dpa, 2021)

In January 2020, the government introduced the International Protection Act 4636/2019 (cf. appendix 8) which announced the restructuring of all hotspots into *Closed Controlled Structures*³¹. According to this plan, the current RICs would be replaced with new facilities (AFP News Agency & InfoMigrants, 2021). However, the project met resistance from local communities, prolonging the existence of Mavrovouni indefinitely (Pallister-Wilkins et al., 2021:21,24-25).

²⁸ Information retrieved during the interviews.

²⁹ Lead exposure can damage brain and nerve cells, stunt child growth, as well as impact learning, hearing, and speaking abilities (NCEH, 2021). Lead exposure is exacerbated by natural hazards (e.g., rainfall, flooding, strong winds) disturbing the soil (HRW, 2020). Medical and environmental experts have criticized the decision to construct a camp on this site because lead exposure is a familiar issue on firing ranges (ibid).

³⁰ The tents received wooden floors and insulation (UNHCR, 2020b:2).

³¹ Also called *Multi-Purpose Reception and Identification Center* (cf. Lesbos Solidarity, 2021b).

5.3. Humanitarian Standards and Guidelines

Refugee camp planning/management and humanitarian response operations are directed by various policies, standards, and guidelines. This chapter summarizes seven internationally acknowledged, non-binding guideline documents for refugee camp planning. While the documents are universally acknowledged by governments and humanitarian organizations, it is the responsibility of each state to adopt them into legislation, resulting in different interpretations in EU states (EASO, 2016:7). The international and national policies underlying the standards and their national implementation are outlined in appendix 7.

Sphere Association – Minimum Standards for Shelter and Settlement

The Sphere Association was founded in 1997 to improve quality and accountability in humanitarian operations and provides the principal global standards for refugee camp planning (IOM et al., 2015:15; Pallister-Wilkins et al., 2021:10; Sphere Association, 2018a; UNHCR, 2018b:4). Their legal foundation is based on the Universal Declaration of Human Rights and the 1951 Convention (cf. appendix 7) (IOM et al., 2015:16,118). Its values are based on the Protection Principle, the Humanitarian Charter, and the Core Humanitarian Standard (Sphere Association, 2018b:2) (cf. appendix 9).

Sphere defines minimum standards for (i) water supply, sanitation, and hygiene (WASH) promotion, (ii) food security and nutrition, (iii) shelter and settlement, and (iv) health (Sphere Association, 2018b:2). Under shelter and settlement, the standards stipulate that shelter design should minimize risks and vulnerabilities through, e.g., protection from natural hazards (ibid:59,275).

The category “shelter and settlement” comprises seven standards (cf. figure 8). Standard 1 recommends that shelter/settlement is planned in a way that enhances safety and well-being of residents. To achieve this, Standard 2 prescribes a safe location. One key indicator is the percentage of shelter in areas with no or minimized exposure to hazards. Unavoidable hazards need to be accounted for in planning. Meeting these objectives requires constant monitoring and updating of risk assessments (ibid:246,249-253). When shelters are damaged by natural hazards, lessons learned should be incorporated into reconstruction (ibid:262).

Sphere stresses the necessity to analyze the context. This is congruent to risk assessments which require a preceding context description (cf. chapter 4.2.1). Relevant for both objectives are the identification of: (i) those affected, (ii) their needs and vulnerabilities, (iii) their coping

strategies and capacities, (iv) protection threats and risks, (v) seasonal variations in hazards, (vi) involved stakeholders, (vii) response capacities, (viii) response plans, (ix) available goods and services, (x) supply chains, (xi) infrastructure capacity, and (xii) logistical capacity constraints (ibid:11).

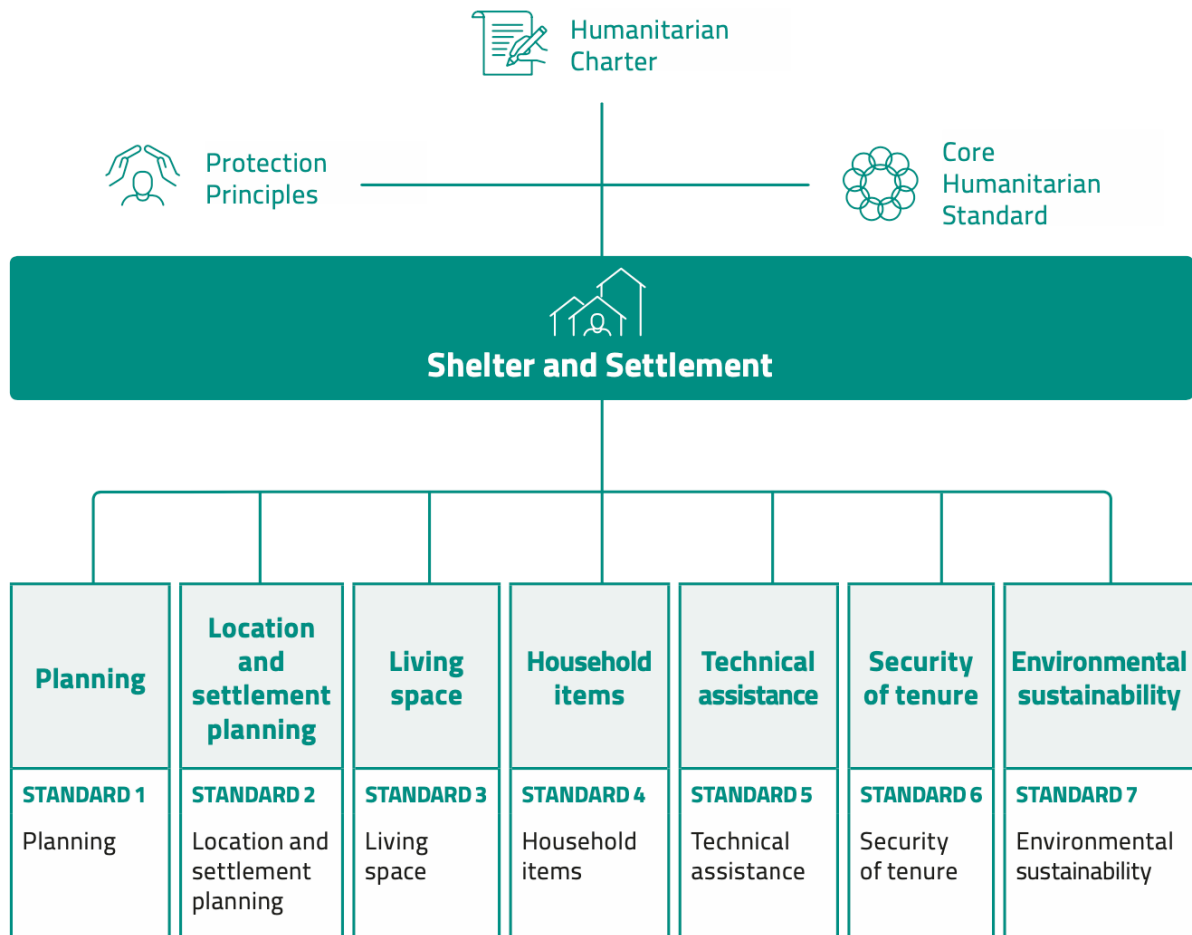


Figure 8: Sphere Standards for shelter and settlement planning (Sphere Association, 2018b:238).

UNHCR Emergency Handbook and the Global Strategy for Settlement and Shelter

Based on the Sphere Standards, the Emergency Handbook³² gives practical suggestions for incorporating natural hazards into site planning to mitigate disaster risks (UNHCR, 2018b:4, 2021e:5). The Global Strategy for Settlement and Shelter provides standards for settlement and shelter design and outlines strategies on how to include them in contingency planning (UNHCR, 2014:5).

³² UNHCR published different Emergency Handbook documents, each with their own focus. Thus, different sources are cited as the Emergency Handbook.

Settlement and shelter design are a crucial aspect of preparedness and contingency planning in camps (ibid:17). Failing to implement adequate standards during the planning process increases risks and may lead to secondary displacement (UNHCR, 2022b:5). However, standards are limited by the uniqueness of local geography³³, climate, cultural practices, demographic developments, skills, and availability of resources. Thus, planning needs to happen within these contexts to mitigate risks (UNHCR, 2014:22, 2018b:3-4, 2021e:5).

The Handbook stresses the relevance of camp lifetime. They state that tents and plastic sheeting are reasonable in emergency response but not for longer-term camps as their lifespan is limited (UNHCR, 2014:24, 2022b:1).

Camp Management Toolkit

Published in 2004 and updated in 2015, the Camp Management Toolkit (CMT) complements the Sphere Standards by providing standardized guidelines for roles and responsibilities of stakeholders in camp activities (IOM et al., 2015:9).

The CMT recommends to base camp design on the outcomes of risk assessments (ibid:172). When constructing a camp, the CMT stresses the importance of planning long-term, including unexpected events, and the avoidance of exposure to natural hazards (ibid:96). This requires a coordinated site plan (ibid:232) of which hazard mapping should be the first step. Additionally, it includes area size, resource availability, cultural/social aspects, local communities, public health issues, topography, geology, and vegetation (ibid:98-99). The information is also utilized for site-specific contingency plans (ibid:41).

Camp Coordination and Camp Management (CCCM) Cluster - Minimum Standards for Camp Management

The standards were developed as a supplement for the Sphere Standards and CMT because field practitioners criticized a lack of practical guidelines for camp management. By providing 17 standards under five management categories (cf. figure 9), they intend to enhance dignified housing and minimize hazard exposure (CCCM Cluster, 2021:iii,vii,9).

³³ E.g., topography is highly relevant for site selection. A slope of 2-4% ensures drainage. It should be <10% to mitigate erosion and enable better construction work. Soil should be permeable but not too sandy for stabilization. Furthermore, in camps prone to flooding or heavy rainfall, adequate drainage infrastructure needs to be in place. The site should have enough vegetation to protect shelters from heat, wind, erosion, and dust generation which can cause respiratory diseases (UNHCR, 2022b:3-7).

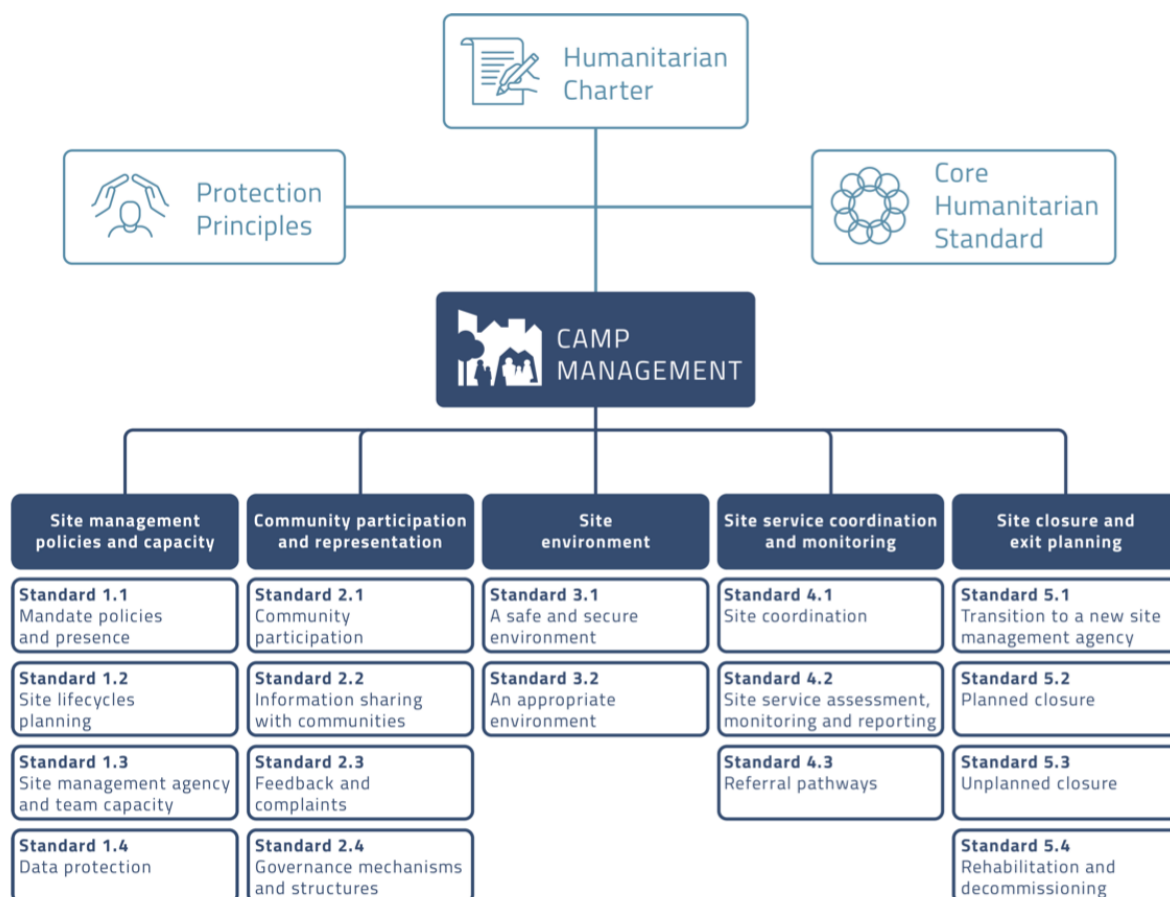


Figure 9: Standards³⁴ to include in refugee camp management (CCCM Cluster, 2021:11).

The standards are interconnected, thus, meeting one requires progress in others. This section briefly describes those relevant for natural hazard risk assessments.

Standard 1.2 recommends the development and regular review of contingency plans accounting for natural hazards, unplanned increases in refugee numbers, duration of camp existence, and needs of vulnerable people. This requires an assessment and monitoring of (cascading) risks (ibid:13,16,40). Meeting this objective requires fulfillment of Standard 1.3 prescribing availability of adequate operational and technical capacity (ibid:17).

Standard 3.1 determines that the camp environment must be safe. This requires the development of a site-specific and regularly updated safety plan with input from risk assessments, the formation of a safety committee, and communication of risks to the population (ibid:35-36).

³⁴ The guiding principles are the same as for the Sphere Handbook.

EASO Guidance on Reception Conditions and Contingency Planning in the Context of Reception

The Guidance on Reception Conditions is based on Directive 2013/33/EU (cf. appendix 7). Since the directive is ambiguous, the document clarifies standards, indicators, and good practices to facilitate the improvement of reception conditions on both the policy and operational level in the EU (EASO, 2016:7). The document on Contingency Planning in the Context of Reception was developed due to the overburdening of reception systems in EU member states. This situation highlighted the need for better preparedness of reception authorities to cope with natural hazards. Consequently, the document guides the development of contingency plans in reception contexts to assist long-term planning (EASO, 2018:9-10).

To ensure a safe living environment and housing for PoCs and field staff, the European Asylum Support Office (EASO) recommends using risk assessments. They should be based on local and national regulations and informed by feedback from staff and PoCs, housing conditions and location, demographic factors, and intersectional vulnerabilities (EASO, 2016:19,47).

To increase preparedness, the Contingency Planning document highlights the need to utilize risk assessments and scenario-based planning to identify hazards, risk mitigation measures, and develop response plans (EASO, 2018:12-14,17,53). The EASO specifically underlines the relevance of identifying gaps in resources and capacities for the scenarios identified in the risk assessment to prepare for emergencies (ibid:13,33). Additionally, contingency plans should be revised and updated regularly based on feedback from staff and PoCs (ibid:14-15).

6. Results

This chapter is divided into four parts: The first and second describe the stakeholders involved in the risk assessments, and the general risk assessment approach identified for both case study sites, as this is vital contextual information for the research questions. Ideally, this data would have been included in the *Background* chapter. But as the literature scoping did not yield respective results, the information was retrieved during the interviews and is thus more suited for the *Results* chapter. Building on this knowledge, the third and fourth sections identify the *challenges to carrying out risk assessments for natural hazards in refugee camps* (RQ 1), and *what potential pathways could address these challenges to facilitate the safety of refugees and asylum-seekers* (RQ 2) by triangulating the findings from the primary and secondary data collection. Unless specified further, the findings were identified by respondents from both case study sites.

Four interview respondents worked in Moria, four in Mavrovouni, and two in both sites. Two worked in Kara Tepe but occupied leading positions in the Working Groups managing the island-wide response, thus possessing relevant information about comprehensive risk management. The respondents worked for EU agencies, UN agencies, or NGOs. Some individuals switched between these organizations during their deployment. To protect the identity of the respondents, statements are not allocated to organization types or working groups. A major limitation is that neither the Reception and Identification Service (RIS) nor the Greek military, who are the highest-ranking stakeholders in both case study sites, agreed to be interviewed.

6.1 Stakeholders

As the highest-ranking national authority, the Ministry of Migration and Asylum³⁵ is responsible for directing the Greek refugee response (UNHCR, 2016a:1). They initiated the Reception and Identification Service (RIS) to manage the Reception and Identification Centers (RICs) (cf. appendix 7). Each RIC is headed by one RIS-appointed director (FRA, 2019:27; NRC, 2020). Five respondents confirmed that military personnel provide operational and managerial assistance (cf. WHO & MoH, 2020:5) as both case study sites are located on military facilities (Karagiannopoulou et al., 2020:41; McElvaney, 2018). The RIS relies on NGOs and inter-governmental organizations (IGOs) for providing most services (FRA,

³⁵ The Ministry of Migration Policy until July 2019 (Karagiannopoulou et al., 2020:152).

2019:27). To coordinate the organizations, they receive support from EU agencies and UNHCR³⁶ (UNHCR, 2016a:1).

The UNHCR established seven Sector Working Groups (SWGs)³⁷: (i) Protection (focus on child protection and gender-based violence), (ii) WASH, (iii) Shelter and Non-Food Items, (iv) Health and Nutrition, (v) Education, (vi) Site Management Support, and (vii) Food. Each group is managed by one coordinator and co-coordinator. The purpose of the SWGs is to develop sector-specific response plans, including contingency plans, and ensure the adherence to HMSs under their jurisdiction (ibid:2). They comprise members of the UNHCR, IGOs, and NGOs, each of which may coordinate or co-coordinate a group. Additionally, each SWG has a UNHCR focal point (UNHCR, 2016b). Three respondents reported that UNHCR mostly focuses on broader governance aspects and assigned NGOs as implementing partners.

The SWGs are headed by an Inter-Sector Working Group (ISWG) chaired by UNHCR and a municipality representative (UNHCR, 2016a:1, n.d.c). The ISWG ensures technical oversight and guidance for the SWGs, manages information, creates general contingency plans, and promotes consistent standards (UNHCR, 2016a:1). Additional subsidiary groups are the *Communication with Communities Working Group*, the *Cash Group*, and the *Information Management Unit*. The latter is relevant for risk assessments because it manages information systems and data collection; and produces statistics, maps, assessments, and reports (ibid:2-3).

The stakeholders identified as most relevant for risk assessments are the RIS and those involved in shelter and infrastructure development from the WASH and shelter SWGs. It is crucial to recall, however, that the multi-hazard and multi-sectoral nature of risk assessments (Cardona et al., 2012:91; Poljanšek et al., 2021:27) requires consultation with all stakeholders, including PoCs and the local population/authorities (IOM et al., 2015:38; Poljanšek et al., 2021:28).

After the destruction of Moria, two respondents confirmed that the SWG structure remained, but decision-making power was pulled out of the SWGs and centralized. According to three respondents, site development for Mavrovouni is now directed by a construction manager from an external company reporting directly to the RIS; shelter meetings involve the RIS, European

³⁶ The UN General Assembly mandated UNHCR to direct and coordinate organizations in refugee situations (IOM et al., 2015:122; UNHCR, 2015). Among its tasks are needs assessments, the development of response plans, and information management (IASC, 2012:10; UNHCR, n.d.:1).

³⁷ The Working Group structure is contextual. The presented groups are specific to Lesbos (UNHCR, 2016a:3).

Union Agency for Asylum³⁸ (EUAA), and construction company (but no UN agencies or NGOs); while the police ensure safety. Moreover, Mavrovouni has a vulnerability office to which protection issues can be referred.

Despite the centralization of power, two respondents emphasized that the RIS collaborated with other organizations to retrospectively improve site layout and infrastructure independent of the SWGs. Moreover, *Working Action Groups* were developed when required. For example, *Storm*, comprising NGOs and the RIS, was established to address flooding. Two respondents reported that such endeavors were usually initiated by NGOs.

6.2. Risk Assessment Process

To answer the research questions, it is crucial to understand how a theoretical risk assessment framework was applied in the case study sites. The literature scoping did not reveal whether a risk assessment was conducted for either site. While no assessment was published or mentioned in accessible documents, the possibility remains that assessments were not publicized. The interviews thus probed the knowledge respondents had of a potential risk assessment process. The interviews revealed that risk assessments for natural hazards were conducted in both sites, although through different approaches. Several decentralized and sectoral assessments informed risk management in Moria. In Mavrovouni, a single risk assessment was conducted by an external company. This chapter outlines the process for each case study site.

In Moria, the RIS delegated the responsibility for assessing risks to the UNHCR. According to three respondents, the RIS and military were not involved. They explained that the UNHCR brought site management and engineering experts to the camp but lacked expertise in various sectors. Consequently, the UNHCR applied a twofold strategy: Deploying their own engineers to assess the site, and assigning NGOs involved in the SWGs and infrastructure projects to carry out risk assessments for their area of expertise.

Two respondents recalled that the UNHCR provided funding for risk assessments in Moria under the category *preparedness*. This section contained risk categories such as winter, summer, blackouts, or WASH repercussions³⁹. Funding recipients were required to develop risk scenarios and mitigation strategies for their sector. Four respondents reported that their

³⁸ Formerly the European Asylum Support Office (EASO).

³⁹ No information was obtained on how these categories were created.

assessments were then discussed in the SWGs. Additionally, the UNHCR had a person in every ISWG and SWG meeting to observe whether risks were included in the agenda. During camp construction, the risk assessments were regularly updated. One respondent stated that risk identification was discontinued after more permanent infrastructure was established. The focus then switched to maintaining the Sphere Standards.

One respondent employed by an NGO shared their risk assessment. Around a year after Moria became an RIC, the organization identified key risks and mitigation measures for the infrastructure they had been assigned to construct and maintain. In accordance with traditional risk assessment frameworks⁴⁰ (Aven & Wiley, 2015:42), they assigned each risk a likelihood score from one (very unlikely) to five (very likely), and an impact score from one (negligible) to five (critical). These numbers were multiplied and the risks placed in a risk matrix. Risks scoring 1-7 were deemed acceptable, those scoring 8-14 fell into the ALARP⁴¹ region, while 15-25 was deemed unacceptable, requiring treatment. The respondent was unaware what the acceptance levels were based on. The assessment identified 19 risks of which two may be caused by natural hazards: one considered acceptable (flooding due to inadequate drainage) and one considered ALARP (fire⁴²). The results were shared with the respective SWG, which referred relevant information to the ISWG. Another respondent confirmed that the SWG and ISWG members could provide feedback and request for additional risks to be included. Information identified by UNHCR engineers and risk assessments conducted by the SWG were shared at weekly ISWG meetings comprising stakeholders from each SWG to facilitate a mutual understanding of all risks hitherto identified.

Management of Mavrovouni is more centralized than it was in Moria. As the RIS prioritized violence over natural hazards, it delegated the responsibility for safety to the police. While the risk assessment process for Moria was well-understood by most respondents due to their involvement, only one respondent from an NGO knew about the risk assessment process for Mavrovouni due to a personal inquiry. According to the respondent, an external agency was hired by camp management four to five months after establishing Mavrovouni to conduct a risk assessment within two to three days. A small delegation conducted the assessment once, and the results were not shared outside the RIS. The respondent was not provided with more detailed

⁴⁰ Focusing on probabilities/likelihood and expected values (Aven & Wiley, 2015:42). The UNHCR applies the same strategy (UNHCR, 2020c:20-21).

⁴¹ As low as reasonably practicable.

⁴² Although it was unclear whether the scenario referred to forest fires or arson.

information about the process. As no other respondent is aware of the risk assessment, it is unlikely that the agency consulted with other stakeholders in the camp.

Despite being unaware of a risk assessment, one respondent reported that preparedness for meteorological hazards was discussed during bi-weekly shelter meetings involving representatives from the Ministry of Migration and Asylum, the EUAA, and the infrastructure maintenance company, and that all organizations can make preparedness-related suggestions to the ministry or UNHCR. Nonetheless, five respondents reported that identification and mitigation of risks was mainly done by NGOs, occasionally in cooperation with PoCs, in both case study sites.

Concludingly, Moria and Mavrovouni have in common that risk assessments were carried out retrospectively as the most pressing matter was keeping people alive and providing shelter:

“Risk assessments came as more organizations started coming. In the early days of the Greek refugee response, it was very much just trying to keep people alive, trying to keep people safe.” – Respondent from Moria

No respondent could confirm whether the risk assessment process took the National Civil protection Plan Xenokrates, the Nat-CHAMM, or the Agnodiki project into account (cf. appendix 7).

6.3. Challenges

The documents prescribing HMSs (cf. chapter 5.3) clearly express the obligation to incorporate risk assessments into refugee camp management. As illustrated previously, Greek authorities meet this responsibility in its fundamentals, yet exposure to natural hazards and unsafe living conditions indicate the insufficiency of a purposeful assessment process. This section presents the challenges to carrying out risk assessments for natural hazards in refugee camps (RQ 1) by triangulating information from the interviews with findings from the literature scoping.

6.3.1. Awareness

Four respondents involved in the risk assessments or protection-related tasks prioritized violence or epidemiological risks and paid only marginal attention to natural hazards. The respondents mentioned a mixture of reasons: Investment into social hazard prevention

dominates because they are deemed more severe and immediate; there is a strong political focus on threats *from* PoCs instead of *to* them; lacking awareness of natural hazards which may affect the sites; and few experts on DRM. Moreover, the conclusion of the risk assessment process after the establishment of more permanent infrastructure indicates that awareness is lacking for the dynamic, emergent, and uncertain nature of risks from natural hazards.

Although no insights were achieved for the risk assessment process in Mavrovouni, it is reasonable to assume that these issues also affect the succeeding RIC:

“I don’t think any government so far has realized that this [natural hazards] is an aspect that should be taken into account.” – Respondent from both case study sites

“As if everybody was surprised that winter was coming [...]. So, then the winterization started. It was completed when it was spring, so much too late anticipated.” – Respondent from Mavrovouni

The quotes highlight that lacking awareness is an issue on both the camp and national level. The state government’s awareness plays a vital role as the Ministry of Migration and Asylum sets the agenda for camp planning (UNHCR, 2016a:1). When the ministry centralized the management in Mavrovouni and delegated the responsibility for safety to the police, the inherent experiences of this stakeholder inevitably influenced risk management in favor of social hazards.

6.3.2. Political Attitude

Three respondents emphasized the deliberation with which the safety of PoCs was put at risk by keeping the camps below minimum standards. One respondent explained:

“There were many instances where we had arguments with camp management [about their] ways. Well, how can we even have the conversation? This is a MINIMUM standard.” -Respondent from Mavrovouni (emphasis added)

The objective, they argued, was deterrence. This indicates that state authorities lack commitment to address hazard exposure and vulnerability. While political opinions likely biased the respondent’s statements, various literature sources support this finding (Fili, 2018;

Gisti, 2016:15; Gordon & Larsen, 2021:425; Howden, 2020a; Pallister-Wilkins, 2020:72; Papadatos-Anagostopoulos, 2020). Some authors ascribe this strategy to a general hostile perception of PoCs within the EU (Almustafa, 2021:13; Cunniffe et al., 2019:8; DeLargy, 2016:5; Fili, 2018; Howden, 2020a; IRC, 2020:9; Pallister-Wilkins, 2020:75).

To some extent, international media pressure provided a counterpoise to the policy of deterrence. Five respondents reported that it shaped how Greek authorities acted. In Moria, risk assessment results were considered when they overlapped with areas of media attention, indicating that reputation may have played a larger role in risk management than exposure or vulnerability. This trend recurred in the transition from Moria to Mavrovouni. While UN agencies and NGOs were actively involved in risk management in Moria, the international attention coerced Greek authorities to assume tighter control, as the event highlighted the unsafe conditions PoCs were exposed to in the old RIC. Consequently, both the public and the EU demanded better conditions to avoid a repetition of old mistakes which resulted in the centralization of decision-making power (Pitchers & Murray, 2020).

Unsafe living conditions partly result from a reluctance of authorities to apply a long-term planning perspective as suggested by humanitarian guideline documents (EASO, 2018:9-10; IOM et al., 2015:96). This undermines proactive risk management. Five respondents reported that the Ministry of Migration and Asylum emphasizes the temporary nature of refugee camps as the government fears public discontent should they acknowledge a need for more permanent planning. Instead, their focus is on maintaining order and providing temporary shelter, even when it is unsuitable over longer periods. Thus, any long-term investments into risk management activities are reportedly rejected.

6.3.3. Time

The HMSs recommend that natural hazards are assessed during the planning phase (IOM et al., 2015:98-99,172; Sphere Association, 2018b:59). Six respondents criticized that planning in neither case study site adhered to this, resulting in the retrospective assessment implementation. Howden (2020b:58-63) and Fossvik (2016) confirm the lack of an appropriate design phase for Moria due to its gradual transition from military facility to small reception center to RIC, and because local authorities were already overwhelmed by the arrival of asylum-seekers before the hotspot policy (cf. appendix 7). Three respondents similarly argued that the primary objective in 2015 was to provide shelter to as many people as possible in a minimal timeframe, conceding

exposure to natural hazards and HMSs a secondary priority. Both were addressed when more humanitarian organizations arrived, but six respondents stated that overcrowding ultimately made these efforts futile.

For Mavrovouni, proactive planning was challenged by the pressure to rapidly provide shelter for those displaced by the Moria fire⁴³. Three respondents argued that the site was selected due to its proximity to Moria and the availability of space. Exposure to natural hazards only received attention retrospectively, hence the postponement of the risk assessment. Pallister-Wilkins et al. (2021:90) confirm this argument.

6.3.4. Capacities

Capacities exist on three levels: The enabling environment (laws, power relations, social norms), the organizational level (organizational resources, structures, policies), and the individual level (individual skills/experiences). They may be functional (planning/leadership, resource management, monitoring/evaluation) or technical (skills/knowledge) (UNDRR, 2019:20-21). Capacity gaps on all levels were identified as relevant challenges for risk assessments. This chapter explores which capacities are lacking for Greek authorities and NGOs, as these key stakeholders were repeatedly mentioned during the interviews.

Greek authorities

When the RICs were initiated in 2015, Greek authorities were unprepared to receive the mounting numbers of asylum-seekers. According to two respondents, they lacked the necessary planning and financial capacities, including expertise regarding vulnerability and risk assessments. Further, a request for international support was delayed. As one respondent put it:

“[...] In terms of doing professional risk assessments, and having feedback loops, having a system that holds accountable, that was just not there.” -Respondent from both case study sites

The literature scoping confirmed these findings (European Commission, 2020; Fossvik, 2016; MSF, 2017:13; Oxfam International, 2019:2-3; SVR, 2021:15). A report by the UNHCR (2009:8-10) shows that this mixture of functional and technical capacity gaps on the

⁴³ Although it can be argued that authorities should have provided an evacuation site, this goes beyond the scope of the thesis.

organizational level was already prevalent prior to 2015. Moreover, one respondent reported that stakeholders were not aware of the General Secretariat for Civil Protection (GSCP) prior to Covid-19, despite the preparedness-related expertise of the authority (cf. appendix 7).

On the individual level, five respondents reported that management personnel had little work experience in humanitarian contexts and lacked knowledge about HMSs. Kalir & Rozaku (2016) confirm this finding. They interviewed a former director of Moria, who indicated that the root causes for these capacity gaps emerged through power structures originating in the enabling environment (cf. chapter 7.1). Reportedly, the Ministry of Migration and Asylum ignored his requests for support, resulting in strong reliance on NGOs and a lack of resources, training, and guidance. He called it a “*state of abandonment*” that undermined the response.

NGOs

NGOs were/are a crucial support for risk management activities in both case study sites. However, four respondents reported that their organizational capacities are impacted by high staff turnover, a lack of DRM experts, and scarce funding, all of which led to the fragmented sectoral risk assessments in Moria. Moreover, two respondents criticized that the employment of foreign nationals without knowledge about the local context or lacking local language skills exacerbated data collection activities.

The sectoral risk assessment shared by one respondent shows how insufficient technical capacities are translated into practice. The document only includes a risk evaluation⁴⁴, lacking information on the context, risk identification, and risk analysis. These steps may not have been recorded in the same document. However, the consequences are not sorted according to hazard source or presented through different risk metrics, no potential number of affected people is embedded into a temporal perspective⁴⁵, and data is not interpreted in terms of uncertainty and sensitivity. Thus, the organization likely did not apply a professional risk assessment framework. Accordingly, the insufficiency of technical expertise for risk management activities appears to be a crucial challenge in Moria.

⁴⁴ A catalog of potential consequences, their anticipated severity, and possible mitigation activities.

⁴⁵ The assessment focused on possible disruptions to infrastructure services and epidemiological hazards resulting from inadequate infrastructure maintenance.

6.3.5. Inflexibility

The rapidly developing context in both case study sites calls for flexible and adaptable decision-making processes. However, the inability of stakeholders to sufficiently monitor the changing environment and incorporate the new data is a recurring theme throughout most interviews.

Rapid contextual developments complicated risk management activities. Four respondents mentioned the speed at which the physical environment⁴⁶ changed, while two respondents pointed out that the currency of risk assessment data was challenged by the rapidly changing demographic environment⁴⁷. In total, six respondents reported that any planning efforts failed to account for the speed with which Moria expanded:

“Make the first assessments for [...] 100-200 people per day. Then, when you have three or four or five consecutive days, and receive 500 people, you realize that you cannot predict this. So additional plans or revisions had to be made. [...] When the numbers started to be exceeded, reaching [a total of] 6000, 7000, at some point, it was 15,000... I’m sorry to say that, but all plans were going down the drain.” – Respondent from Moria

The ability to adapt strategies and methods to a dynamic environment was severely undermined by bureaucracy. Eight respondents stated that requests on the operational level are frequently delayed by the strategic-level modus operandi of the ministry or UNHCR; and that decisions made on the strategic level occasionally lack a transition strategy to reach the operational level. As one respondent from Mavrovouni put it:

“There were always these two levels, the meta-level discussion and what will happen on the ground, and there was a big gap between those two. You know, [...] sometimes in office meetings, something was decided. It’s going to happen in two weeks. But it didn’t happen after three months, so it never happened.”

When organizations involved in the risk assessments got entangled in bureaucracy, the protracted work environment prevented an efficient process that accounts for rapid contextual changes. For example, one respondent reported that the UNHCR’s strategy meant that field

⁴⁶ Primarily infrastructure and shelter.

⁴⁷ Particularly due to high mobility of PoCs in initial months (DeLargy, 2016:6), and the gradual overcrowding in Moria after the implementation of the geographic restrictions (GCR, 2020; IRC, 2020:5).

visits were followed by several weeks in the office to acquire approvals. Thus, the UNHCR had to rely on information provided by NGOs on-site. According to one respondent, the bureaucracy increased in Mavrovouni due to the centralization of power:

“Bureaucracy-wise, [...] everything took much longer than it did in Moria. [...] it was now very much based on rules, based on restrictions, especially when it comes to building things, [...] you had to hand in a proposal that would go through Athens [...]. It just slowed the whole process down tremendously. Because they had to get more involved because they had more attention.” -Respondent from both case study sites

According to the Commissioner for Human Rights from the Council of Europe (2019), bureaucracy is a general challenge in Greece.

6.3.6. Funding

This section focuses on Moria, as no funding-related information was obtained for Mavrovouni. Inflexible and insufficient funding were identified as major limitations for risk management. Two respondents explained that funding applications had to be based on needs assessments, but due to the dynamic context, information was outdated when grants arrived. Additionally, five respondents criticized that funding could not be reallocated, as most funding is earmarked, and obtaining donor approval takes time during which the context changes further. Thus, resources could not be redirected to risk management activities when risks were identified retrospectively. Strict funding rules from donor agencies aggravated this challenge. According to four respondents, hazards for which no organization received a mandate could not be addressed. Lastly, one respondent emphasized that natural hazards *may* have consequences *in the future*, but their uncertainty and insignificance for needs-based short-term objectives conceded them lower priority and insufficient funding.

The literature scoping identified increasing earmarking⁴⁸ as the principal reason for the inflexible, short-term focused, and time-consuming funding procedures (Poole, 2014:21,24,34). This issue is exacerbated by an increasing demand for humanitarian funding, as this results in a prioritization of immediate needs over preparedness activities (ibid). While the short-term nature of funding (ibid) was not mentioned by the respondents, they criticized the lack of long-

⁴⁸ The HLP reports an increase of earmarked funding for all UN agencies from 15% – 81% between 2003 and 2013 (2016:20), while Poole reports an increase from 52% in 1992 to 92% in 2012 (only WFP/UNICEF/UNHCR) (2014:38).

term planning (cf. chapter 6.3.3). Further research should clarify to what extent short-term funding affects risk management in refugee camps.

6.3.7. Lack of Standard Operating Procedures

The following arguments were only identified by respondents from Moria. Four respondents mentioned the lack of Standard Operating Procedures (SOPs) as a crucial challenge for risk assessments. The lack of SOPs, they argued, resulted in a lack of documentation (cf. chapter 6.3.8), and thus, loss of information. Moreover, without a guiding framework, the profoundness of the sectoral assessments was left to the judgement of organizations. The challenge of insufficient SOPs is confirmed by the literature scoping (European Commission, 2016:4; Howden, 2020b:61; IASC, 2012a:4; NRC, 2020; UNHCR, 2014:5) and appears to be a prevalent challenge in emergency planning for decades (Alexander, 2005:159).

6.3.8. Information Management

A primary reason for not finding proof of risk assessments during the literature scoping is likely linked to the lack of documenting risk-related information, as reported by two respondents:

“And we didn’t have any protocol, there was no standardized documentation for risk assessments. [...] So, there wasn’t really a checklist or a sheet or something that we used. [...] So, I bet 5% of everything was written down.” – Respondent from SWG

This strategy resulted in the loss of valuable risk information that could have helped future decisions. This challenge is exacerbated by a lack of information sharing mechanisms between stakeholders. As risk assessments were not done participatorily in either case study site, and the results were not shared, only those involved in risk management or actively inquiring⁴⁹ about the topic were aware of their existence. Six respondents stated that this situation is the result of inadequate information sharing mechanisms in both sites. This is a common issue in humanitarian operations (HLP, 2016:22; IASC, 2012a:4) which significantly reduces the potential to achieve a multi-hazard/multi-sectoral response (Sphere Association, 2018b:16). According to six respondents, the principal outcome of inadequate information sharing is uncoordinated camp planning/management and unclear/overlapping mandates. Additionally, five respondents reported that it wasted resources, as organizations collected the same data. The

⁴⁹ In the case of Mavrovouni (cf. chapter 6.2).

literature scoping supports these findings (Gordon & Larsen, 2021:434; HLP, 2016:3; Howden, 2020b:63; Mavrikos-Adamou, 2019; Sphere Association, 2018b:16).

Two respondents reported that a central reason for the inadequacy of information sharing is competition for funding. Poole (2014:46) and the High-Level Panel on Humanitarian Financing Report to the Secretary-General (HLP) (2016:3) note that inter-agency competition is an increasing issue for collaboration and coordination throughout the humanitarian sector:

“While the need for joint planning is often talked about, in reality every organisation is an island. ‘Turf wars’ are a common occurrence, with each organisation trying to position itself as the best implementer—and therefore most deserving of donor funds. This duplicates efforts and saps energy which humanitarian aid can ill afford to lose.”
(HLP, 2016:3)

This situation undermines transparency and trust, both fundamental for collaboration and coordination (IOM et al., 2015:61), and may partly explain the lack of publicly available risk assessment information. There are unofficial attempts to address this issue, as described by one respondent from Moria:

“[Our SWG was] very pushing into finding solutions, not overlapping, and having good coordination. We were having coordination meetings where we kept half of the time out of the officially recorded minutes [...]. Because we were not formally allowed to talk about all the internal strategies, what proposals we are submitting to different donors.”

The respondent described how this strategy resolved overlapping responsibilities and competition, despite being prohibited by donor agencies. The respondent was aware that the strategy lacks transparency.

Lastly, risk assessments should be informed by feedback from all stakeholders (ibid:38; Poljanšek et al., 2021:28). Six respondents confirmed the lack of feedback mechanisms for risk assessments in both case study sites, although the absence of information sharing already indicated that no stakeholder outside of the assessment process was consulted with.

6.4. Recommended Actions

While risk assessments were conducted in both case study sites, the findings outlined in the previous chapter reveal that numerous vital prerequisites, both functional and technical, are either inadequate or lacking. The primary data collection yielded five *potential pathways to addressing these challenges* (RQ 2) presented below. As potential pathways applicable to risk assessments in refugee camps were not previously addressed in academic literature, the findings contribute to closing a research gap that is particularly relevant for the field of DRM.

6.4.1. Risk Management Focal Point

Addresses:

*Awareness
Capacities
Inflexibility*

Risk assessments should be multi-hazard and multi-sectoral to account for the complexity of risk (Cardona et al., 2012:91; Poljanšek et al., 2021:27).

The fragmented operating principle, lacking awareness of natural hazards, insufficient technical and functional capacities, and unclear mandates were identified as limitations for achieving this objective. Five respondents

recommended the creation of a risk management focal point (RMFP) to mitigate these challenges:

“The risk assessment process would have been better if there were people with the only goal of focusing on this. Basically, a unit that will be multi-sectorial, not only focused on what my department has to do, having a broader view on this topic.” – Respondent from Moria

“Have one person on the ground whose sole responsibility is risk assessments and natural hazards. [They] could be from an organization, a Greek authority, the security focal point. There should be one sector which only focuses on natural hazards, especially because their likelihood increases under climate change.” -Respondent from Mavrovouni

Congruently, the Camp Management Toolkit states that camp management should employ risk assessment experts to ensure protection of PoCs (IOM et al., 2015:183). The General Secretariat for Civil Protection, which is responsible for DRM and national risk assessments, possesses the functional and technical capacities to provide such experts (Politou et al., 2015:820-821). The respondents emphasized that this strategy has the potential to evade bureaucratic procedures (cf. chapter 6.3.5) if the functions of the RMFP were clearly defined *ab initio* and the position received adequate resources and mandates. To serve the purpose, the RMFP needs to have the

capacities to manage data collection and monitoring/evaluation (M&E) responsibilities that involve stakeholders from other organizations, conduct iterative multi-hazard risk assessments, and convincingly communicate risk assessment results to decision-makers to facilitate action. As each risk metric has a unique focus, the RMFP ideally knows how to present risk through various metrics (Johansen & Rausand, 2014:397). The sectoral assessment shared by one respondent from Moria only showed a risk matrix, thus, the necessary technical capacities were seemingly lacking. Nonetheless, a RMFP should not simply assume roles previously covered by other organizations. To combat the fragmentation of sector-specific knowledge and utilize existing structures, the RMFP should involve the SWGs for data collection, feedback, and M&E. The assessment results and mitigation suggestions could either be presented to camp management directly or conveyed through the ISWG and UNHCR as management’s closest implementing partner. Preferably, the RMFP would apply an acknowledged risk management framework to facilitate transparency, comparability, and transferability of the process and results. The ISO (2009a:vii) (cf. figure 1) is a suitable option, as the framework is already applied by EU agencies (Poljanšek et al., 2021:29). Since the EU supports the Greek response, it is reasonable to assume that they have pre-established connections through which technical and functional guidance can be channeled.

6.4.2. Capacity Development

Addresses:
Awareness
Capacities
Inflexibility
Funding

As outlined in chapter 6.3.4, capacities exist on three levels⁵⁰. Six respondents provided suggestions on all three levels⁵¹ that can be categorized as capacity development. This chapter commences with recommendations on the individual level and gradually extends the scope to the enabling environment.

Individual level

Insufficient awareness of HMSs undermines the safety of PoCs (cf. chapter 6.3.4). Therefore, one respondent recommended protection mainstreaming into all activities to ensure actors are adequately educated about HMSs. This would improve risk awareness⁵² and provide risk managers with a value-based framework on which to base risk assessments and mitigation measures. Moreover, one respondent emphasized that enhanced risk awareness especially

⁵⁰ The enabling environment, the organizational level, and the individual level (UNDRR, 2019:21).

⁵¹ It should be noted that the suggestions overlap.

⁵² As Cornell & Jackson (2013:530) point out, risk awareness is insufficient to facilitate actions. Examining the relation of risk awareness and actions in refugee camps should be explored further, but this is beyond the scope of the thesis.

benefits local staff and their communities, yielding the secondary benefit of increased local resilience. Another approach could be to presuppose DRM capacities for newly recruited staff, thus avoiding costs for retrospective capacity development.

Organizational level

Three respondents emphasized the need to develop organizational capacities to increase the efficiency and flexibility of risk management activities and reduce bureaucracy (cf. chapter 6.3.5 and 6.3.6). They specifically identified the necessity to improve strategic and budgetary planning of organizations to target the funding gridlock, as NGOs commonly seek funding for areas in which they do not have expertise. Thus, developing functional capacities of organizations should support a strategic redirection of temporal, monetary, and human resources into areas where they can apply their expertise most effectively, improving the quality of services that contribute to safety. The HLP (2016:19) supports these findings. Moreover, the European Commission (2020) confirms the need for “*adequate staff training, capacity and planning, including risk assessment and contingency planning*” in Greek authorities responsible for refugee camp planning.

Oxfam International (2019:3) highlights that capacities on the organizational and individual level are crucial to translate the legislative tools of the enabling environment into action.

Enabling Environment

Sustainable capacity development occurs simultaneously on all levels, but the enabling environment is arguably the paramount one (UNDRR, 2019:99). CADRI (2011:23) points out that capacities are best utilized with ownership, commitment, and accountability at the highest political level. As changing power structures is ideal but presumably unfeasible, active capacity development for policymakers targeting “*strategic legislation, policies, procedures, budgeting, and strategic planning*” could present an alternative pathway (UNDRR, 2019:58). Three respondents pointed out the need for capacity development of RIS and ministry officials on DRM and coordination. Based on insights provided by the respondents and literature scoping (Crombleholme, 2020; NRC, 2020), there are several NGOs with the relevant functional and technical capacities that could support capacity development for government authorities. This might be more successful when facilitated by a mutually accepted stakeholder such as the UNHCR (suggested by UNDRR, 2019:61,65).

6.4.3. Flexible Funding

Addresses:

Inflexibility Funding

As outlined in chapter 6.3.6, the inflexibility of funding impedes the utilization of resources for risk management activities. Two respondents recommended less earmarking as a potential pathway to solving this challenge. The literature scoping mirrors this finding (HLP, 2016:20; Poole, 2014:34). Alternatively, another respondent suggested donor consultation and adaptation of funding objectives based on the risk assessment results to increase the flexibility and timeliness of risk management. Both suggestions may be exacerbated by what HLP call the “*chain of humanitarian financial transactions*”: Funds are frequently passed to NGOs via several intermediaries⁵³. Each link adds bureaucracy and usually earmarking (2016:17). Any alterations thus need to take the whole chain into consideration. The literature scoping provided two suggestions to bypass the traditional funding chain and increase flexibility: “*Rapid and specific emergency procedures for demanding additional resources*” (EASO, 2018:34), or the improvement of NGOs’ fund management capacities to directly receive higher-level funding (Poole, 2014:52). The latter is congruent with the recommendation of developing budgetary planning capacities outlined in chapter 6.4.2.

6.4.4. Standard Operating Procedures

Addresses:

Capacities Lack of SOPs

Chapter 6.4.3 recommends that capacity development targets *procedures* in the enabling environment to enhance organizational and individual capacities (cf. UNDRR, 2019:58). Four respondents indirectly referred to this recommendation, as they mentioned the lack of SOPs as a central challenge for risk assessments and management, and conversely suggested the development of SOPs to address this challenge. They pointed out that SOPs: (i) provide a starting point for new staff, (ii) ensure that stakeholders are “*on the same page*” and produce comparable assessments, (iii) accelerate the risk assessment process by providing clear guidance, (iv) facilitate coordination between stakeholders, and (v) possibly result in a more holistic assessment. Moreover, one respondent recommended to develop SOPs on how to incorporate risk assessment results into decision-making for the RIS, thus facilitating protection mainstreaming (cf. chapter 6.4.2). Various literature sources mirrored the demand for more SOPs in refugee camp planning (European Commission, 2016:4; IOM et al., 2015:183; NRC, 2020; UNHCR, 2014:5).

⁵³ It commonly follows the trajectory: government – intermediary – UN agency – NGO (HLP, 2016:17).

One respondent stated that the Sphere Standards functioned as the guideline document for risk assessments in Moria. However, while the standards provide a good framework for the values that underlie risk assessments, they do not demonstrate how to implement it. As the framework outlined by the ISO (2009a, 2009b) is a common risk assessment tool already applied by EU agencies (Poljanšek et al., 2021:29), it may provide a good starting point for developing SOPs adapted to the refugee camp context⁵⁴.

6.4.5. Information Sharing Mechanism

Addresses:

*Awareness
Capacities
Inflexibility
Funding
Information
Management*

A central challenge for risk assessments is the lack of information sharing mechanisms (ISMs) (cf. chapter 6.3.8). ISMs are essential to coordinate risk management activities (CCCM, 2021:43; Ignatova et al., 2020:9; IOM et al., 2015:60), and the transparent dissemination of risk assessments is crucial for improving assessment and mitigation measures (ibid:26). Correspondingly, four respondents emphasized the need for an ISM for facilitating risk assessments. They highlighted the potential of ISMs to enable a faster and more comprehensive response as well as preventing duplicated activities, thus saving resources for currently neglected issues such as preparedness for natural hazards. The IASC (2012a:4) generally reflects these arguments for the wider humanitarian sector, adding that ISMs facilitate monitoring, evaluation, and learning.

However, developing ISMs requires a change of donor practices (cf. chapter 6.3.8). Poole (2014:22,48,52) points out that the development of a transparent coordination and communication strategy between donor agencies will likely be the key pathway to facilitate information sharing on the operational level. If achieved, the author recommends the inclusion of ISMs and risk mapping into funding guidelines.

A good ISM has the potential to facilitate the work of the Risk Management Focal Point (cf. chapter 6.4.1), as six respondents pointed out that NGOs have valuable technical capacities that jointly provide a promising basis for a multi-hazard and multi-sector risk assessment. This is congruent to recommendations from the Camp Management Toolkit (IOM et al., 2015: 229). Moreover, one respondent indicated that volunteer groups have the potential to contribute to M&E, as they have a larger workforce than NGOs and are less restricted by donor regulations on how to deploy them. McConnell & Drennan (2006:66) provide a similar recommendation

⁵⁴ The drawbacks of SOPs are discussed in chapter 7.4.

for contingency planning in emergency preparedness. However, this requires sufficient technical capacities of volunteer groups.

Risk assessments should be participatory. When PoCs are already inside the camp, they should be involved in the process (IOM et al., 2015:38; Poljanšek et al., 2021:28). The failure to implement this in both case study sites is a major challenge for the identification of vulnerabilities/capacities and risks. To involve PoCs and facilitate ownership and monitoring, two respondents⁵⁵ established a PoC committee representing the different social groups and nationalities in Moria. The committee monitored risks and provided feedback which representatives shared in the SWG. The respondents recommended the expansion of this practice into all sectors. The Sphere Standards and Camp Management Toolkit propose the same strategy (IOM et al., 2015:50; Sphere Association, 2018b:39).

Generalizability of the Recommended Actions

While the focus of the thesis was on risk assessments for natural hazards in two specific case study sites, triangulation with literature showed that most pathways are generally applicable to humanitarian operations in displacement contexts. Thus, limited generalization in accordance with an inductive research strategy is possible (Blaikie, 2010:83). Nonetheless, further research should investigate the transferability to other case studies both within and outside of the Greek context.

⁵⁵ Members of the same SWG.

7. Discussion

7.1. The Fundamental Root Cause: Power

Challenges for risk assessments in the case study sites can be traced to a set of fundamental root causes. According to the Pressure and Release (PAR) model⁵⁶ (cf. appendix 10) by Wisner et al. (2004:52), “*root causes [...] are an interrelated set of widespread and general processes within a society and the world economy*”. They originate from ideologies, politics, the economy, and access to resources, all of which may be classified as *power structures*⁵⁷ (ibid:51). Yet, altering power structures usually results in opposition, with extensive and unpredictable cascading effects (ibid:7). Thus, root causes are challenging to mitigate. All pathways outlined in chapter 6.4 rather address *dynamic pressures*. These are “*processes and activities that ‘translate’ the effects of root causes both temporally and spatially into unsafe conditions*⁵⁸” (ibid:53). Combined with hazards, these unsafe conditions create risk (ibid:51). The unsafe living conditions and exposure to natural hazards in both sites demonstrate the transferability of the PAR onto a practical example.

The government’s priorities influence the legislative environment for response operations on Lesvos. Pallister-Wilkins et al. (2021:8,20) point out the deterioration of living conditions following the 2019 elections, as the new conservative government prioritized border security (WHO & MoH, 2020:13). However, the politics of deterrence were already criticized prior to 2019 (DeLargy, 2016:5; Fili, 2018; Gisti, 2016:15), indicating a more profound rooting in hostile societal and political attitudes that concede lower value to PoCs than Greek citizens (cf. chapter 6.3.2). This is a crucial determinant for risk management in refugee camps. As outlined in chapter 4.4, risk only emerges when something of value is threatened (Aven & Renn, 2009:6; Poljanšek et al., 2021:14; Slovic, 2001:19,23), and the authority controlling the risk definition ultimately determines resulting actions (ibid). When risks affect those without esteemed livelihoods, such actions tend to be marginal (Wisner et al., 2004:53). The low priority conceded to PoCs is also reflected in the government’s definition of vulnerability⁵⁹, as it

⁵⁶ As the research strategy was inductive, the applicability of the PAR model was not anticipated prior to developing the discussion section and was thus not introduced previously.

⁵⁷ Power can be defined as: (i) social relations, (ii) the power “to” achieve a goal, (iii) power “over” others, (iv) structures (e.g., social norms), or (v) agents (i.e., deliberate actions to achieve goals) (Djoudi et al., 2016:249-250; Hearn, 2012:4-9). This thesis focuses on power as structures.

⁵⁸ Includes “*dangerous locations, unprotected buildings and infrastructure, special groups at risk, and lack of disaster preparedness*” (Wisner et al., 2004:51), all of which are prevalent in both case study sites.

⁵⁹ As an integral aspect of risk assessments (Ostrom & Wilhelmsen, 2012:249).

excludes various vulnerable groups and disregards intersectionality⁶⁰ (GCR, 2020; Pallister-Wilkins et al., 2021:33).

Consequently, the low priority conceded to the safety of PoCs is a major root cause for the inadequacy of the examined risk assessments. This argument is supported by recent developments in Greek legislation. Currently, a new *Multi-Purpose Reception and Identification Center* for 5,000 people is being constructed on Lesbos. While an Environmental Impact Assessment⁶¹ (EIA) was a prerequisite for camps exceeding 750 places, a ministerial decision changed this threshold to 5,000 in March 2020 (Lesvos Solidarity, 2021b). Although EIAs and risk assessments are different tools, both proactively aim to ensure a safe environment. The government's choice thus highlights a disregard for safety concerns. An interview with Stavros Miroyiannis by Howden (2020a) confirms this argument: As a local army officer, he was commissioned to assess the suitability of Moria as an RIC in 2015. He concluded that the location is unsuitable, and if authorities selected the site, they should approach the planning process “*as they would [...] a village*”. Evidently, this advice was ignored. Facilitating risk assessments is thus primarily an issue of addressing political priorities, and only secondarily of lacking awareness (cf. chapter 6.3.1).

The challenges described in chapter 6.3.2 (*Political Attitude*) and 6.3.3 (*Time*) could not be covered by the recommended actions, as they emerge from the power-related root causes. Contrastingly, all other challenges largely stem from lacking institutions, training, skills, or standards that constitute dynamic pressures (Wisner et al., 2004:51). However, in accordance with the PAR model, these dynamic pressures also originate from the political and social structures that constitute root causes (ibid). The capacity gaps outlined in chapter 6.3.4 illustrate this relationship. A report published by the UNHCR (2009:8-10) criticized that functional and technical capacities were already insufficient in Greek authorities before the construction of RICs. According to Weber (2016:21), this originates from a weak public administration body that was further undermined by Europe's economic restrictions after the 2008 financial crisis. One consequence is inadequate human and monetary resources for the RICs which many

⁶⁰ Intersectionality assesses the qualitative interrelations of different power dimensions forming distinctive vulnerability patterns for each individual. These patterns influence one's capacity to cope with or adapt to hazards (Kuran et al., 2020:2,7). The most frequently mentioned dimensions are gender, age, ethnicity, class, religion, immigration status, disability, health status, occupation, income, and social networks (ibid:2; Sphere Association, 2018:56; Wisner et al., 2004:6,11).

⁶¹ Important differentiation: An EIA examines the social and environmental consequences of a project (Morgan, 2012:5), while a risk assessment examines hazards potentially affecting a project (Johansen & Rausand, 2014:388).

Greeks attribute to EU restrictions. In combination with the EU's refusal to assume responsibility for the hotspots (Cunniffe et al., 2019:11-12; Ziebritzki, 2020), this led to frustration especially on the islands hosting the RICs, increasing support for the conservative government elected in 2019 (IRC, 2020:9; NRC, 2020; Pallister-Wilkins et al., 2021:20; Weber, 2016:21).

Thus, lacking capacities exacerbate root causes that restrict risk management, while the longevity of capacity gaps indicates that they are influenced by an unsupportive enabling environment⁶² (CADRI, 2011:9-10). Concludingly, root causes and dynamic pressures can be interdependent, adding to the complexity of challenges impeding risk assessments.

While addressing power structures in the social and political system might be the most efficient pathway to facilitate risk assessments in refugee camps, such changes require time and effort on many societal levels, and the outcomes are unpredictable. This defies the limited timeframe during which the case study sites existed/presumably will exist. Moreover, it initiates a philosophical debate about political and societal priorities, and thus goes beyond the thesis scope. Chapter 6.4 therefore focused on more practical and less ambiguous pathways, even though they target symptoms rather than causes.

7.2. Short-term vs long-term perspective

Although camps are not a durable solution, the Camp Management Toolkit emphasizes that their uncertain lifetime necessitates long-term planning (IOM et al., 2015:19). All guideline documents concur that such an approach involves a proactive assessment of risks (CCCM Cluster, 2021:35-36; IOM et al., 2015:98-99; Sphere Association, 2018b:11; UNHCR, 2014:17;). However, risk assessments were conducted retrospectively in both case study sites, as the most pressing matter was to account for immediate needs (cf. chapter 6.2). It is not surprising that contemporary challenges have precedence over *possible* future scenarios when resources are scarce (cf. chapter 6.3.4). As McConnell & Drennan (2006:62) put it: "*Thinking the unthinkable [...] becomes more difficult when resources are tight*". Hence, risks are treated reactively. This also became apparent in the sectoral risk assessment shared by one respondent, which focused on immediate consequences of identified risks but did not illustrate possible long-term or cascading consequences. Such a reactive strategy undermines a long-term

⁶² As the enabling environment comprises "*rules, laws, policies, power relations and social norms*" (UNDRR, 2019:21), it resembles the definition of root causes.

planning approach which is needed to sustainably ensure a safe camp environment and develop practical contingency plans.

A short-term perspective also prevails on the national (González, 2021; WHO & MoH, 2020:14) and international/EU level (Mayer & Mehregani, 2016:9; Pascouau, 2016:24). Some authors indicate that the failure to apply a long-term planning approach emerges from inadequate functional capacities rather than lacking resources, as the EU invested 3.38 billion euros into the Greek response between 2016 and 2020 (Council of Europe, Commissioner for Human Rights, 2019; ECRE, 2022; SVR, 2021:21;). The same challenge affects the humanitarian sector, as a major drawback of donor-based funding is its short-term perspective (Poole, 2014:21,24,34). This is a severe challenge in a world in which disasters become increasingly complex and unpredictable (IPCC, 2012:50,492).

While the recommendation to apply long-term planning appears straightforward, its implementation needs to go beyond resources/capacities and take the enabling environment into account. As outlined in chapter 6.3.2, the Ministry of Migration and Asylum emphasized the temporariness of RICs, as local communities reject long-term planning due to the economic decline that followed their establishment (SVR, 2021:19). Thus, the transition to long-term planning can only be sustainable if done collaboratively with local communities.

7.3. Fragmentation

Risk assessments need to be multi-sectoral to account for the complexity of interconnected and cascading risks (Cardona et al., 2012:91; Poljanšek et al., 2021:27). In opposition to this, a sectoral approach was applied in Moria. Although no respondent directly mentioned this as a challenge for risk assessments, the lack of information sharing, competition, and the fact that stakeholders outside of the risk assessment process were unaware of its existence (cf. chapter 6.3.8), support the assumption⁶³ that fragmentation may be among the most central challenges. This severely undermines the: (i) holism of the assessment due to lacking collaboration and feedback mechanisms (EASO, 2018:14-15), (ii) ownership of assessment results for those excluded from the process (own assumption), (iii) risk awareness (Coppola, 2011:272), and (iv) monitoring, evaluation and learning opportunities (ISO, 2009a:vii; United Nations, 2015:15).

⁶³ Further research is needed to confirm or refute the assumption.

However, pathways for solving this challenge should not only address fragmentation between organizations and authorities. The Camp Management Toolkit emphasizes the need to consult with PoCs in the risk assessment process if they are present in the camp (IOM et al., 2015:38). The failure to implement community consultation in both case study sites is a major limitation for the identification of vulnerabilities/capacities and risks, and thus the relevance and application of risk assessments. If implemented, collaboration with PoCs has the potential to facilitate awareness, accountability, ownership of the assessment, M&E, and acceptance of mitigation measures (Cardona et al., 2012:91; Rausand, 2011:135). Access to information technology could provide a starting point for improving collaboration with PoCs given that illiteracy and language diversity are accounted for (EASO, 2018:23; HLP, 2016:21-23; UNHCR, 2021d:19). This strategy is increasingly shaping disaster response operations (HLP, 2016:22). Furthermore, local PoC committees (cf. chapter 6.3.8) might be a good strategy to target fragmentation. However, the approach requires strategies that ensure the inclusion of marginalized groups as they are less likely to be represented in committees (UNHCR, 2021d:7).

7.4. The Inflexibility of Standards

Emergencies are chaotic and unpredictable (McConnell & Drennan, 2006:67). While some respondents emphasized the utility of SOPs to improve risk assessments (cf. chapter 6.4.4), others cautioned that they may be too inflexible to account for complexity, uncertainty, and the rapidly changing context. Wassénus & Crona (2022:39) share this concern, stating that most risk assessment tools do not incorporate complexity. Thus, SOPs need to be flexible enough to adapt to new situations (Poljanšek et al., 2021:42; Rausand, 2011:135), as “*risk management [should be] dynamic, iterative, and responsive to change*” (ISO, 2009a:8). While the guideline documents (cf. chapter 5.3) can provide a starting point for developing SOPs, they are likewise criticized as inflexible to account for dynamic demographic and infrastructural developments (Chamma & Arroyo, 2016:80; Kennedy, 2005:46). Further research should inquire into the potential of SOPs for coordinating operations in refugee camps.

7.5. Interconnectedness

In Moria, risk assessments were based on thematic categories prescribed by UNHCR funding guidelines, resulting in the sectoral approach outlined in chapter 6.2. This strategy impedes a holistic perspective of risk that accounts for interdependencies and cascading effects between categories. Moreover, it may overlook risks that do not fall into any pre-established category. Combined with the fragmented working approach from chapter 7.3, this challenge is a barrier to making risk assessments multi-hazard and multi-sectoral.

It is insufficient to only assess natural hazards, as risk emerges within a complex system comprising both natural and social aspects (Cornell & Jackson, 2013:506). While the sectoral assessments in Moria did not exclusively focus on either, the assessment shared by one respondent indicated that the predominant focus was on human-induced actions that may impact infrastructure, while it failed to address interdependencies between hazards. This is a challenge to holistic assessments and their potential to provide adequate risk mitigation measures. The respondents shared various examples that highlight the interconnectedness between natural and social hazards: Cooking fires increased the risk of forest fire during drought; overcrowding increased exposure because PoCs were forced to sleep in self-made shacks or summer tents; and freezing temperatures combined with poor accommodation deteriorated health conditions and increased the risk of disease (WHO & MoH, 2020:13). Thus, it is vital that risk assessments account for such interdependencies to identify hazard causes, reduce vulnerabilities and/or exposure, and avoid maladaptation (Cardona et al., 2012:90; IOM et al., 2015:66; Wassénus & Crona, 2022:40-41; Wisner et al., 2004:5). Applying a multi-hazard and multi-sectoral approach, however, presupposes appropriate DRM capacities by practitioners (cf. chapter 6.3.4 and 6.4.2).

Finally, the findings illustrate that most challenges and pathways are not only applicable to risk assessments but the entire multi-hazard risk management cycle as they primarily emerge from the strategic, political, and societal enabling environment that affects the operational humanitarian level, further highlighting the interconnectedness of power and practices.

7.6. Limited Generalization

In accordance with the inductive research approach presented by Blaikie (2010:83), the triangulation with literature allowed for the identification of trends that interlink the contextual findings with the general enabling environment of the humanitarian and Greek/European governance systems. Nonetheless, the unique context of the cases, the small number of interviews, and the different risk assessment approaches limit the generalizability of the findings. They should be replicated by research in other case study sites to allow for overall generalizability. The recommended actions are thus only applicable to the Moria and Mavrovouni context. However, they provide indications which topics may be worth exploring in future research.

7.7. Integrity and Validity of the Results

The integrity and validity of the results is affected by several limitations. Most importantly, the small number of respondents with similar backgrounds in the humanitarian sector makes the research susceptible to biases stemming from their personal opinions (Adams, 2015:493; ISO, 2009b:29). In fact, answers frequently reflected frustration. This is particularly relevant as the challenges and recommended actions intersect with the concept of power. As one study on migration puts it: “*The migration topic has become highly controversial in recent years. There are many different interests, and not everyone might want to describe the actual situation, but instead follow a political agenda in order to accomplish specific goals*” (Paul, 2021:224). This does not entail that the results are wrong, but that the reader needs to apply a critical perspective, and that the research needs confirmation from studies involving additional stakeholder groups, e.g., from the strategic humanitarian level, national authorities, or PoCs. Moreover, the data availability was much higher for Moria due to the more inclusive risk assessment approach, highlighting the need for more in-depth research of the risk assessment process in Mavrovouni. This will likely be exacerbated by the reluctance of Greek authorities to provide access to and permit publishing of information which also reduced that availability of interview partners for the thesis.

Moreover, the author does not speak Greek. It is possible that relevant documents were not translated into English and were overlooked during the literature scoping. Furthermore, the individual keywords or keyword combinations are limited and may have excluded relevant sources, while databases not considered in the thesis may contain important information. Therefore, future research should be conducted in other languages, primarily Greek, and utilize additional databases and keywords, e.g., *disaster* and *risk management*.

7.8. Potential for Further Research

This thesis explored how a theoretical framework from DRM (i.e., risk assessment) is implemented in humanitarian practice, using the context of two Greek RICs as case study sites. It further identified challenges and potential pathways to address them, as neither has previously been assessed by academic literature with respect to refugee camp management in the EU: “*Refugee camps are still a relatively new phenomenon [in the European context] and are only barely covered by the literature*” (Paul, 2021:222). The author, who compared living conditions in Greek and Italian refugee camps, criticizes the lack of an interdisciplinary approach that utilizes a complexity perspective. Congruently, the thesis found that a transdisciplinary

approach to exploring risk management practices is lacking, as most academic sources that inform the background, results, and discussion sections originate from sociology, political science, or migration studies that do not incorporate technical DRM frameworks. Combining the expertise of these different fields has the potential to explore displacement contexts more holistically.

Moreover, the findings illustrate that academic literature barely covers experiences on the operational level in Greek refugee camps. The respective information was predominantly retrieved from the primary data collection, while the secondary data collection focused on the strategic humanitarian or political level. Thus, assessing operational realities on the ground is a crucial research gap identified during the thesis process. Furthermore, the thesis highlights a communication gap between academia and the strategic humanitarian level that provide theoretical risk assessment frameworks on one side, and the operational level that is supposed to translate these theoretical frameworks into practice on the other side. Further research should investigate why this gap emerged, and how to address it to ensure efficiency and timeliness of humanitarian response operations.

As triangulation informed the development of challenges and recommended actions, the results are expected to be credible. Nonetheless, more research is needed to confirm generalizability of the findings in a Greek and broader European context, and how they interrelate with power structures, societal values, and humanitarian operating principles on a strategic level. Finally, future research should explore the utility and adaptability of current risk management frameworks to dynamic emergency and displacement contexts.

8. Conclusion

The thesis explored how a theoretical risk assessment framework examining natural hazards is implemented in the dynamic humanitarian contexts of two RICs on the Greek island of Lesbos; which challenges impede the risk assessment process; and what pathways have the potential to address these challenges.

Eight challenges (RQ1) were identified that impede risk assessments in Moria and Mavrovouni: (i) lacking awareness of natural hazards, (ii) an unsupportive political environment, (iii) time constraints, (iv) capacity gaps in Greek authorities and NGOs, (v) inflexibility of administrative practices in a rapidly changing environment, (vi) inflexible and insufficient funding, (vii) lack of SOPs, and (viii) insufficient information sharing. The respondents recommended five potential pathways (RQ2) to mitigate these challenges namely, establishing a risk management focal point, capacity development, flexible funding mechanisms, developing SOPs, and better information sharing mechanisms.

As refugee camps are only marginally researched in the European context, no scientific publication was obtained that assesses how risk assessments are implemented in practice, and what impedes or facilitates the process. Thus, the research covers a critical knowledge gap that is particularly relevant for DRM and the humanitarian sector and has the potential to contribute to the academic fields of migration studies, political sciences, and sociology. The thesis addresses this gap and contributes to academia by demonstrating the relevance of the interrelated political and social environment, and particularly power structures and functional capacities, in shaping vulnerability and risk in European refugee camps. These results support the applicability of the Pressure and Release Model (PAR) in this context. Although the relationships outlined in the model are well known in social science, the thesis shows the applicability of the PAR model for the first time in the researched refugee camp environment. These findings are especially relevant because the number of displaced people is increasing, and it is likely that refugee camps will remain, or grow, as a strategy to address this issue. Making camps more resilient is a critical topic that should receive further attention by academic research in DRM.

More research is needed to explore the feasibility and utility of the recommended actions, as the fundamental root causes for the identified challenges demonstrably emerge from the enabling environment. Thus, using a natural hazard risk assessment to inform risk mitigation

measures supports the development of more resilient living conditions in refugee camps in the short-term. Sustainably reducing vulnerability, however, requires a shift in political and social power structures and values that initially caused the unsafe living conditions. No respondent provided a concrete recommendation on how to achieve this, highlighting the complex and challenging nature of shifting power. Instead, the identified recommended actions focus on more tangible interventions that primarily address technical and functional capacity development. Future research should explore how to facilitate change in the enabling environment that has the potential to sustainably solve the challenges outlined in the thesis. Additionally, further case studies including more diverse stakeholders are needed to expand and confirm the results, ideally from an interdisciplinary perspective. Future studies should also assess the interdependencies between natural, social, and technological hazards to provide holistic, credible, and generalizable findings.

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Appendices

A1. Interview Guide

<p><u>Opening Section</u></p>	<ul style="list-style-type: none"> ● Introduction of the interviewer ● Summary of the research project ● Clarification of interview objectives ● Clarification of the participant’s rights <ul style="list-style-type: none"> ○ Assurance of confidentiality ○ Right to refrain from answering questions and to withdraw from the interview at any time ○ Right to withdraw the consent for the interviewer to use any information obtained until this point ● Question for consent to participate and recording of the interview <ul style="list-style-type: none"> ○ <i>Note: If the consent for the interview is denied, it ends here. If consent for the recording is denied, the interviewer switches to manually taking notes.</i> ○ <i>Note: When the participant gives consent for recording, the recording process is initiated now.</i> ● Question regarding their preference for anonymity and quoting ● Any further questions before we begin?
<p><u>Main Section Part 1:</u> <i>Clarification of key concepts to ensure mutual understanding.</i></p>	<ol style="list-style-type: none"> 1. How would you define risk assessments? 2. How would you define natural hazards?
<p><u>Main Section Part 2:</u> <i>Focused questions to fathom the context of the organization’s responsibilities and background information relevant for exploring the research questions in Main</i></p>	<ol style="list-style-type: none"> 3. Which minimum standards for shelter and settlement in refugee camp planning does your organization consider? 4. Which regulations/guidelines does your organization adhere to when working in refugee camp planning/management? 5. What are the functions of your organization in the

<p><i>Section Part 3.</i></p>	<p>Moria and Mavrovouni RIC, and how do they relate to assessing risk from natural hazards?</p> <ol style="list-style-type: none"> 6. Which natural hazards are relevant for the Moria and Mavrovouni RIC? 7. Are contingency plans in place for the Moria and Mavrovouni RIC? <ol style="list-style-type: none"> 7.1. If yes, who developed the plans and which natural hazards do they include? 7.2. If yes, how efficient are the contingency plans in case of emergency? 8. Are the Moria and Mavrovouni RIC included in municipal or regional contingency/emergency response plans?⁶⁴ <ol style="list-style-type: none"> 8.1. If yes, to what extent compared to local municipalities? 8.2. If not, why? 9. Are risk assessments for natural hazards conducted during refugee camp planning? <ol style="list-style-type: none"> 9.1. If yes: Continue with question 13. 9.2. If not: Continue with question 10.
<p><u>Main Section Part 3:</u></p> <p><i>Open-ended questions to explore the participant's experiences and perspectives which provide information for the research questions.</i></p>	<p>If risk assessments are not conducted:</p> <ol style="list-style-type: none"> 10. Why are risk assessment for natural hazards not conducted during refugee camp planning? <ol style="list-style-type: none"> 10.1. Which internal factors need to change to support an adequate risk assessment process for natural hazards during refugee camp planning? 10.2. Which external factors need to change to support an adequate risk assessment process for natural hazards during refugee camp planning? <ol style="list-style-type: none"> 10.2.1. Is the funding adequate to allow for risk assessments in the planning phase?

⁶⁴ According to Law 2013/2002 and Xenokrates, municipalities, regions, and decentralized administration need to generate their own hazard and contingency plans.

	<p>10.2.2. Which funding mechanism can be used to finance risk assessments for natural hazards in refugee camp planning?</p> <p>11. What are the risks and consequences of not conducting a risk assessment for natural hazards during refugee camp planning?</p> <p>12. What are the benefits of conducting a risk assessment for natural hazards during refugee camp planning?</p> <p>If risk assessments are conducted:</p> <p>13. How would you describe the risk assessment process for natural hazards applied in camp planning?</p> <p>13.1. What is the data collection method for the risk assessment process?</p> <p>13.1.1. Are there any challenges concerning the data collection process?</p> <p>14. What was your organization's role in the risk assessment process for natural hazards?</p> <p>15. Which stakeholders are involved in the risk assessment process for natural hazards?</p> <p>16. How does the result of the risk assessment for natural hazards influence decision-making in camp planning and management?</p> <p>16.1. Can stakeholders and camp residents provide feedback regarding the risk assessment process and results?</p> <p>16.1.1. If yes, is this feedback considered and the process/results adapted?</p> <p>16.2. Are risks from natural hazards monitored?</p> <p>16.2.1. If yes, are the results incorporated into the risk assessment?</p> <p>17. To what extent were local climate and geography considered during the planning and construction of the Moria and Mavrovouni RIC?</p>
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	<p>18. Should the risk assessment process be improved?</p> <p>18.1. If yes: How should it be improved?</p> <p>18.1.1. Does the process itself require improvement?</p> <p>18.1.2. Do external factors need to change to facilitate an efficient risk assessment process?</p> <p>18.2. If not: Why should it not be improved?</p>
<p><u>Closing Section</u></p>	<ul style="list-style-type: none"> ● Would you like to add anything that did not come up during the interview? ● Do you have any questions about the interview or project? ● Do you know any other persons whom I could talk to about this topic? ● The session is closed by thanking the participant for the participation

A2. The Ministry’s Definition of Vulnerability

The Greek law 4375/2016 prescribes eight groups as vulnerable: (i) unaccompanied minors, (ii) people with a disability, an incurable or serious disease, (iii) pregnant women (iv) single parents with underaged children, (v) elderly, (vi) victims of torture, rape, sexual violence, or exploitation, (vii) relatives of shipwreck victims, and (viii) victims of human trafficking. Post-traumatic stress disorder, shipwreck survivors, and postnatal women have recently been removed from the list (Karagiannopoulou et al., 2020:109; Pallister-Wilkins et al., 2021:33).

A3. Risk Assessment Process – Additional Information

Authentic risk assessments should be conducted in cooperation with various stakeholders, including technical experts, relevant government authorities, the camp population (if already present), and other stakeholders involved in camp operations (IOM et al., 2015:38; Poljanšek et al., 2021:28). It is practical to establish a permanent working group for this task. It should develop a plan accounting for budgets, activities, responsibilities, time limits, work progress, achievements, and reports (Aven & Wiley, 2015:29). Moreover, the risk landscape in refugee camps is dynamic. As the seasons, camp layout, population number, demographics, shelter, or needs change, so does the exposure and vulnerability to risk. Consequently, good risk assessments are cyclic and apply constant monitoring and evaluation (M&E) (IOM et al., 2015:157; ISO, 2009a:7).

Risk Identification

Risk rating is a common method to select the most relevant scenarios. It illustrates risk based on severity of consequences and likelihood. Most organizations use a semi-quantitative five-tier scale ranging from very low/likely to very high/likely (SSCP, 2014:4). In some contexts, it may instead be advantageous to focus on worst-case scenarios (Rausand, 2011:32).

Risk Analyses

Risk analyses can be qualitative, semi-quantitative, or quantitative⁶⁵ (Rausand, 2011:8,121). A quantitative analysis should be complemented by qualitative descriptions to reflect complexity (Cardona et al., 2012:91). Additionally, uncertainty needs to be communicated. Common methods are uncertainty and sensitivity analyses. Uncertainty analyses examine the collective variation of the risk assessment results from all model parameters, while sensitivity analyses examine the influence of each parameter separately (ISO, 2009b:15).

Risk Evaluation

Risk evaluation commonly applies the ALARP (*as low as reasonably practicable*) principle. Based on likelihood and consequences, it divides risk levels into acceptable (no treatment required), tolerable (ALARP, costs and benefits of risk treatment options are contrasted), and unacceptable (risk must be reduced at any cost) (Aven & Wiley, 2015:31; ISO, 2009b:16; Rausand, 2011:98). It should be noted that acceptance is influenced by the political, cultural, economic, and geographical context (Cornell & Jackson, 2013:506; Edwards & Challenor, 2013:101). The risk evaluation results are shared with all stakeholders and provide input for decision-makers (Cardona et al., 2012:89; Rausand, 2011:118). This is facilitated through different risk metrics, such as risk maps, curves, or matrices (Johansen & Rausand, 2014:386; Poljanšek et al., 2021:29). Risk maps are the most common metric for natural hazards (Douglas, 2007:284). As each metric has a unique focus, risk is best presented with different metrics (Johansen & Rausand, 2014:397).

⁶⁵ A qualitative risk analysis is purely descriptive. A quantitative analysis is based on numerical estimates. A semi-quantitative analysis applies values to a qualitative scale (Rausand, 2011:8,121).

Limitations of Risk Assessments

Lack of information

Risk assessments are often simplified due to lacking or low-quality data, especially at local levels (Cardona et al., 2012:91; Edwards & Challenor, 2013:112; Karimi & Hüllermeier, 2007:987). For example, Eurostat does not gather statistics on reception systems. Greek data on camps is fragmentary due to most camps lacking a legal basis (Mouzourakis et al., 2019:12).

Resources

Refugee camps often have short planning timeframes, limited resources, and lacking human capacities. Therefore, it is a major challenge to balance the required level of detail, time, and resources for risk assessments (IASC, 2012a:12; ISO, 2009b:19; Poljanšek et al., 2021:27; Rausand, 2011:135;). Resource limitations need to be considered in the risk assessment objectives (Aven & Wiley, 2015:29).

Complexity

Risk assessments cover highly complex and ambiguous topics. Consequently, methods and models are simplified (Hill et al., 2013:8-9).

Competing interests

Apart from risk levels, decisions are influenced by other economic, operational, social, political, or environmental aspects. Which aspects are prioritized depends on the stakeholders with the strongest influence in camp planning (Rausand, 2011:23).

Uncertainties

It is impossible to eliminate the chance of unidentified risks because uncertainty is an inherent property of all risks and risk assessments (Rausand, 2011:59).

A4. Relevant Data for the Context Description

Table A1: Relevant data for the context description in risk assessments for refugee camp planning

Geographical	Natural hazards, including seasonal variations (cf. appendix 6) (IOM et al., 2015:101,172,232; Sphere Association, 2018b:274)
	Topography (IOM et al., 2015:100,104; Sphere Association, 2018b:275; UNHCR, 2021e:5)
	Climate, including seasonal variations (UNHCR, 2021e:5; 2022b:6, n.d.a:7)
	Soil conditions (IOM et al., 2015:100; UNHCR, 2021e:5)
	Geology (UNHCR, 2021e:5, n.d.a:7)
	Hydrology (IOM et al., 2015; 230; UNHCR, 2021e:5)
	Vegetation (Rausand, 2011:180; UNHCR, 2021e:5)
	Animals (Rausand, 2011:180)
	Available space. This should exclude all areas not suitable for shelter due to existing hazards or infrastructures (IOM et al., 2015:103; UNHCR, 2021e:5)
	Natural resources (DG ECHO, 2017:12; UNHCR, 2021e:5)
	Available emergency shelters and evacuation sites (IOM et al., 2015:177,229)
Demographic	Expected number of residents (Douglas, 2007:285; EASO, 2016:19; IOM et al., 2015:232; UNHCR, n.d.a:11)
	Average household size (IOM et al., 2015:232; Sphere Association, 2018b:274; UNHCR, n.d.a:11)
	Number of people not staying in typical households (IOM et al., 2015:232; Sphere Association, 2018:274)
	Intersectional data on camp residents to identify vulnerable groups and their needs (Sphere Association, 2018b:12,274; UNHCR, n.d.a:7,11)
Social	Stakeholder mapping (EASO, 2018:53; Rausand, 2011:180)
	Available and required services (CCCM Cluster, 2021:17)
	Accommodation plans for: Families, individuals, vulnerable persons (IOM et al., 2015:104)
	Risks of vulnerable people due to inadequate accommodation (IOM et al., 2015:232)
	Safety issues voiced by the residents (EASO, 2016:19)
	Cultural practices impacting settlement and shelter design (UNHCR, n.d.a:7)

	Capacities of the camp population (IOM et al., 2015:232)
	Typical household and livelihood activities of the camp population (IOM et al., 2015:232)
Political	Guidelines and standards (ISO, 2009a:3)
	Local and national building regulations (EASO, 2016:47)
	Land use on and around the potential site (Cardona et al., 2021:69; UNHCR, 2021e:5)
Operational	Policies, organizational structures, roles, and responsibilities (ISO, 2009a:3; UNHCR, n.d.a:7)
	Technical stakeholder capacities (knowledge, resources) (ISO, 2009a:3)
	Existing contingency plans that are relevant for the camp, and the availability of all resources mentioned in the plans (Rausand, 2011:540; Sphere Association, 2018b:274)
	Adaptive capacity of risk management on camp level and the potential influence of adaptations on vulnerabilities (Cardona et al., 2012:90)
	Emergency preparedness training of staff (Rausand, 2011:541)
	Emergency support from external sources (Rausand, 2011:541)
	Expected response time (Ostrom & Wilhelmsen, 2012:298)
	Information management systems (ISO, 2009a:3)
	Communication channels for emergencies (Rausand, 2011:541)
Technical	Available and required infrastructure, taking accessibility into account (CCCM Cluster, 2021:17; UNHCR, 2021e:5)
	Availability and capacity of external safety junctions (fire engines, hospitals, ambulances etc.) (Rausand, 2011:180)
	Type and conditions of shelter (EASO, 2016:19)
	Type and quality of shelter material (UNHCR, n.d.a:7)
	Availability and cost of resources; local/regional/national supply chains (UNHCR, n.d.a:11)
	Resources for emergency response (Cardona et al., 2012:90)
	Technical data for mechanical infrastructure components (Rausand, 2011:178)
	Maintenance data detailing repair times (Rausand, 2011:179)

The data presented in the table highlights the various aspects natural hazards interact with in refugee camps. Consequently, all aspects need to be considered in risk assessments, even when the focus is exclusively on natural hazards. The table does not claim completeness.

A5. Refugee camps and accommodation facilities in Greece

The literature scoping revealed the existence of 84 camps or accommodation facilities throughout Greece, although the “*myriad[s] of small and medium-scale unofficial initiatives in accommodation*” (Pallister-Wilkins et al., 2021:23,79) render it impossible to identify each. Moreover, different sources convey contradictory information. While the UNHCR (2017) lists 46 camps on the mainland, Pallister-Wilkins et al. (2021:81) name 32 (established 2016 - 2020), and RSA (2018b) 26. According to the GCR (2021a) and Krithari (2021), 32 mainland camps operated in 2021, excluding closed facilities.

The camps meeting selection criterion one (unsafe housing conditions) are marked in yellow.

Table A2: List of refugee camps in Greece

Camp name	Region/ City	Camp type	Housing type	Camp management	Status	Sources
Agia Eleni	Ioannina	UNHCR housing program	Rooms in hostel	UNHCR	n.d.	Dobbs & Tolis (2017), GeoCHOROS (2017)
Agios Andreas	Attica	TAF	n.d.	n.d.	Presumably closed	ANA-MPA (2019), GeoCHOROS (2017),
Alexandria	Central Macedonia	ERS	Containers	Hellenic Army, RIS, Municipality, UNHCR	Open	DW (2021), GeoCHOROS (2017), UNHCR (2017:22), UNHCR et al. (2018:2)
Andravida	Western Greece	ERS	Apartments	Municipality, UNHCR, IOM	n.d.	GeoCHOROS (2017), UNHCR (2017:42), UNHCR et al., (2018:3)
Attiko Alsos	Attica	OCAVRR	n.d.	MoMP	n.d.	Anastasopoulou et al. (2019:29-30), Mouzourakis et al. (2016:22);
Chalkero	Kavala	n.d.	n.d.	n.d.	n.d.	IOM (2016:15)
Derveni/ Alexil	Thessaloniki	ERS	Tents in industrial building	Hellenic Army, IOM	Closed	GeoCHOROS (2017), Owens (2017), UNHCR (2017:23)

Diavata	Central Macedonia	ERS	Containers	MoD, RIS, ASB	Open	GeoCHOROS (2017), Mouzourakis et al. (2019:20), UNHCR (2017:24), UNHCR et al. (2018:4)
Dion-ABETE	Thessaloniki	TAF	n.d.	n.d.	Presumably closed	GeoCHOROS (2017), UNHCR (2017:1)
Doliana-Ionnina	Epirus	Collective Shelter	Rooms in abandoned school	Hellenic Army, RIS, UNHCR, ASB	n.d.	GeoCHOROS (2017), UNHCR (2017:38), UNHCR et al. (2018:5), Youth Center of Epirus (2016)
Drama	Eastern Macedonia	Pre-removal detention centre	Apartments	Hellenic Army, RIS, municipality, IOM	n.d.	GeoCHOROS (2017), Global Detention Project (2020), UNHCR et al. (2018:6)
Elefsina Naval School	Attica	TAF	Rooms in building	Hellenic Army, RIS, IOM	n.d.	GeoCHOROS (2017), RSA (2018a), UNHCR (2017:1), UNHCR et al. (2018:7)
EKO Gas Station	Paionia	n.d.	Tents	None	n.d.	Fronista (2016), IOM (2016:15)
Eleonas	Attica	ERS	Containers	RIS, MoMP	Open	GeoCHOROS (2017), Pallister-Wilkins et al. (2021:83), UNHCR (2017:6), UNHCR et al. (2018:8)
Eleftheroupoli	Eastern Macedonia and Thrace	TAF	n.d.	n.d.	n.d.	Bayaner et al. (2016:86); Mouzourakis et al. (2016:22)
Elliniko I	Attica	ERS	Camping tents	MoMP, DRC	Presumably closed	GeoCHOROS (2017), UNHCR (2017:8)
Elliniko II	Attica	ERS	Camping tents	MoMP, DRC	Presumably closed	GeoCHOROS (2017), UNHCR (2017:9)
Elliniko III	Attica	ERS	Tents	MoMP, DRC	Presumably closed	GeoCHOROS (2017), UNHCR (2017:10)
ESTIA program	Across the country	TAF	Urban apartments	UNHCR	Closed	Pallister-Wilkins et al. (2021:22)
ESTIA II program	Across the country	TAF	Urban apartments	Ministry of Migration and Asylum	Open	UNHCR (2020c)

Filippiada	Epirus	ERS	Containers & pre-fabricated housing units	Hellenic Army, MoMP, RIS, municipality, UNHCR, ASB	Presumably open	GeoCHOROS (2017), RSA (2019a), UNHCR (2017:39), UNHCR et al. (2018:9)
Filoxenia program	Across the country	TAF	Hotels	IOM	Closed	ECRE (2021)
Fthiotida	Cephalonia	n.d.	n.d.	n.d.	n.d.	Mouzourakis et al. (2016:22)
Fylakio	Evros	RIC	Containers	FRS	Open	MacGregor (2022), UNHCR (2017:36)
Giannitsa	Giannitsa	TAF	Tents	Hellenic Army	Presumably closed	GeoCHOROS (2017), Moving Europe (2016b),
Grenava SMS Hotels	Western Macedonia	n.d.	n.d.	n.d.	Presumably open	Karagiannopoulou et al. (2020:164-165)
Idomeni-Evzoni	Paionia	n.d.	Tents	None	n.d.	Fronista (2016), IOM (2016:15)
Kalochori/Illiadi	Thessaloniki	ERC	Tents	Hellenic Army, NRC	Presumably closed	GeoCHOROS (2017), UNHCR (2017:33)
Kalymnos	Leros, Aegean Islands	n.d.	n.d.	None	n.d.	IOM (2016:14), UNHCR (2017:1)
Kara Tepe	Lesvos, Aegean Islands	ERS	Rub halls, refugee housing units, containers	Municipality	Closed	Oxfam International (2021), Pallister-Wilkins et al. (2021:22,75), UNHCR (2017:48),
Karpathos	Karpathos, Aegean Islands	n.d.	n.d.	n.d.	n.d.	IOM (2016:14)
Katsikas-Ionnina	Epirus	TAF	Containers	Hellenic Army, ASB	n.d.	Banks (2016), GeoCHOROS (2017), UNHCR (2017:1), UNHCR et al. (2018:11)
Kato Milia	Pieria	n.d.	Containers	ADRA	n.d.	ADRA (2017:4); Karagiannopoulou et al. (2020:164-165)
Kavala-Perigiali	Eastern Macedonia and Thrace	ERS	Containers	Hellenic Army, RIS, UNHCR, IOM	n.d.	GeoCHOROS (2017), UNHCR (2017:27), UNHCR et al. (2018:12)
Klidi Sintiki	Serres	n.d.	n.d.	n.d.	Presumably open	Karagiannopoulou et al. (2020:164-165)

Konitsa	Epirus	Collective Shelter	Rooms in building	MoLSA, UNHCR	n.d.	GeoCHOROS (2017), UNHCR (2017:40)
Kordelio/Softex	Thessaloniki	ERS	Containers and tents	Hellenic Army, IFRC	Presumably closed	GeoCHOROS (2017), UNHCR (2017:25)
Korinthos	Peloponnese	n.d.	n.d.	n.d.	Presumably open	Karagiannopoulou et al. (2020:164-165)
Kozani	Western Macedonia	TAF	Tents in sports stadium	n.d.	Closed	Mouzourakis et al. (2016:22); WordPress (2016)
Ktima Iraklis/Pieria	Central Macedonia	ERS	Rooms in building	Hellenic Army, RIS, IOM, ADRA	n.d.	GeoCHOROS (2017), UNHCR (2017:29), UNHCR et al. (2018:10)
Lagadikia	Thessaloniki	Relocation site	Containers	Hellenic Army, MoMP, DRC, UNHCR	Open	Jahre et al. (2017:333), Kokkinidis (2021), UNHCR (2017:26), UNHCR et al. (2018:13)
Larisa-Koutsuchero	Thessaly	TAF	Pre-fabricated housing units	Hellenic Army, RIS, DRC	Presumably open	GeoCHOROS (2017), RSA (2019b), UNHCR (2017:1), UNHCR et al. (2018:14)
Larisa-Kypselochori	Thessaly	n.d.	n.d.	n.d.	Presumably closed	GeoCHOROS (2017), IOM (2016:16)
Lavrio	Attica	ERS	Pre-fabricated wooden housing units	Hellenic Navy, MoMP, UNHCR, DRC	Closed	GeoCHOROS (2017), UNHCR (2017:11), UNHCR et al. (2018:15), Vlastou (2021)
Lepida	Leros, Aegean Islands	RIC, Hotspot	Containers, tents, makeshift shelters	Hellenic Army, MoMP, FRS, UNHCR	Closed	AFP News Agency & InfoMigrants (2021), GeoCHOROS (2017), RSA (2019c), UNHCR (2017:1,47)
Malakasa	Attica Region	ERS	Containers in 2017, also tents since June 2018	Hellenic Army, RIS, IOM	Open	GeoCHOROS (2017), Pallister-Wilkins et al. (2021:49), RSA (2018b), UNHCR (2017:12), UNHCR et al. (2018:16)
Mavrovouni	Lesvos, Aegean Islands	Temporary RIC, Hotspot	Tents	Hellenic Army, Ministry of Migration and	Open	Oxfam International & GCR (2020b:3),

				Asylum, UNHCR, IFRC		Pallister-Wilkins et al. (2021:89), UNHCR (2021a:1-2)
Mazaraki/ Cherso	Kilkis	TAF	n.d.	Hellenic Army	Presu- mably closed	GeoCHOROS (2017), New York Times (2016), UNHCR (2017:1)
Megistri	Kastel- lorizo, Aegean Islands	n.d.	n.d.	None	n.d.	IOM (2016:14), UNHCR (2017:1)
Moria	Lesvos, Aegean Islands	RIC, Hotspot	Tents, camping tents, makeshift shelters	Hellenic Army, Police, MoMP, UNHCR	Closed	Pallister-Wilkins et al. (2021:21,87), RSA (2020), UNHCR (2017:49)
Nea Apollonia	Thessa- loniki	n.d.	n.d.	n.d.	n.d.	GeoCHOROS (2017)
Nea Karvali	Eastern Mace- donia	n.d.	n.d.	n.d.	n.d.	Mouzourakis et al. (2016:22)
Nea Kavala	Central Mace- donia	ERS	Containers	Hellenic Army, RIS, UNHCR, DRC, IOM	Open	Boitiaux (2021), GeoCHOROS (2017), UNHCR (2017:27), UNHCR et al. (2018:17)
Oinofyta	Thessaly	ERS	Tents & old building	Hellenic Airforce, IOM	Open	GeoCHOROS (2017), HRW, (2021b), RSA (2018b), UNHCR (2017:17), UNHCR et al. (2018:18)
Old Sfageia	Rhodes, Aegean Islands	ERS	Buildings	Municipality, volunteers	n.d.	UNHCR (2017:50)
Oreokastro	Thessa- loniki	ERS	Tents in building	Hellenic Army, NRC	Presu- mably closed	Baker (2017), GeoCHOROS (2017), UNHCR (2017:28)
Orestiada	Evros	n.d.	n.d.	n.d.	n.d.	Mouzourakis et al. (2016:22)
Orfeas Hotal/Pieria	Pieria	n.d.	n.d.	n.d.	n.d.	IOM (2016:15)
Petra Olympou	Pieria	TAF	Tents	Hellenic Army	Presu- mably closed	GeoCHOROS (2017), Moving Europe (2016c), UNHCR (2017:1)
Pikpa	Lesvos, Aegean Islands	Private housing	Wooden houses, buildings, emergency shelters	Lesvos Solidarity (NGO)	Closed	Lesvos Solidarity (2021a), Pallister- Wilkins et al. (2021:22)

Piraeus Port	Piraeus	Informal settlement	Buildings, tents, trucks	Hellenic Army	n.d.	IOM (2016:15), Pierigh (2016), UNHCR (2017:1)
Pirgos SMS facilities	Peloponnese	n.d.	n.d.	n.d.	Presumably open	Karagiannopoulou et al. (2020:164-165)
Pyli	Kos, Aegean Islands	RIC, Hotspot	Containers and tents	FRS	Closed	AFP News Agency & InfoMigrants (2021), IRC (2020:7)
Rafina	Attica	ERS	Buildings	Hellenic Army, Municipality, DRC	n.d.	GeoCHOROS (2017), UNHCR (2017:13)
Ritsona	Thessaly	ERS	Tents (until November 2016), then containers	Hellenic Airforce, RIS, IOM	Open	GeoCHOROS (2017), Latonero et al. (2018:15-16), UNHCR (2017:18), UNHCR et al. (2018:19)
Schisto	Attica	ERS	Containers, tents	Hellenic Army, RIS, MoMP, UNHCR, DRC	Open	GeoCHOROS (2017), Pallister-Wilkins et al. (2021:84), UNHCR (2017:14), UNHCR et al. (2018:20),
Serres - KEGE	Central Macedonia	TAF	n.d.	Hellenic Army, RIS, IOM	n.d.	GeoCHOROS (2017), UNHCR (2017:1), UNHCR et al. (2018:21)
Sinatex/ Kavalari	Thessaloniki	ERS	Small wooden houses	Hellenic Army, DRC	Presumably closed	GeoCHOROS (2017), UNCHR (2017:30)
Sindos/ Frakaport	Thessaloniki	TAF	Tents	Hellenic Airforce	Presumably closed	GeoCHOROS (2017), UNHCR (2017:31)
Sindos/ Karamanlis	Thessaloniki	ERS	Tents	Hellenic Army, IOM	Presumably closed	GeoCHOROS (2017), UNHCR (2017:32)
Skaramagas Port	Attica	ERS	Containers	Hellenic Navy, MoMP, DRC	Open	GeoCHOROS (2017), O'Connor (2021), UNHCR (2017:15), UNHCR et al. (2018:22)
Souda	Chios, Aegean Islands	ERS	Tents & camping tents	Municipality (inofficial)	Closed	ANSA (2017), Karakoulaki & Tosidis (2017), UNHCR (2017:44)
Thermopiles	Thessaly	ERS	Hotel	Municipality, UNHCR, IOM	n.d.	GeoCHOROS (2017), UNHCR (2017:19),

						UNHCR et al. (2018:23)
Thessaloniki Port	Thessaloniki	TAF	n.d.	n.d.	n.d.	IOM (2016:15), UNHCR (2017:1)
Thiva/Sakiroglou	Central Greece	TAF	Containers and small apartments	Hellenic Army, IOM	n.d.	DW (2017), GeoCHOROS (2017), UNHCR (2017:1), UNHCR et al. (2018:24)
Tilos Military Camp	Tilos, Aegean Islands	ERS	Containers	Municipality	n.d.	UNHCR (2017:52)
Trikala Atlantic	Thessaly	ERS	Containers	Hellenic Army, UNHCR	n.d.	GeoCHOROS (2017), UNHCR (2017:290)
Tsepelovo	Ioannina	TAF	n.d.	n.d.	Presumably closed	GeoCHOROS (2017), UNHCR (2017:1)
Vagiochori	Thessaloniki	TAF	Tents	Hellenic Army, IOM	n.d.	GeoCHOROS (2017), RSA (2019d), UNHCR (2017:1),
Vasilika/Kordogianni estate	Thessaloniki	TAF	n.d.	n.d.	n.d.	GeoCHOROS (2017), UNHCR (2017:1)
Vathy	Samos, Aegean Islands	RIC, Hotspot	Tents and makeshift shelters	FRS	Closed	ANSA (2021), GCR & Oxfam International (2021a:2), IRC (2020:7), UNHCR (2017:51)
Veria/Armatolou Kokkinou	Central Macedonia	ERS	Rooms	Hellenic Army, DRC, MoMP	n.d.	GeoCHOROS (2017), Moving Europe (2016a), UNHCR (2017:34), UNHCR et al. (2018:25)
Vial	Chios, Aegean Islands	RIC, Hotspot	Containers, tents, camping tents, makeshift shelters	Hellenic Army, FRS, IOM	Open	Albertari et al. (2020:7), GCR & Oxfam International (2021a:2), GeoCHOROS (2017), UNHCR (2017:45)
Volos	Thessaly	TAF	Former car exhibition hall	Hellenic Army, MoMP, DRC	n.d.	Dandoulaki & Andriadi (n.d.), GeoCHOROS (2017), UNHCR (2017:1), UNHCR et al. (2018:26),

A6. Evidence of Exposure to Natural Hazards⁶⁶

Table A3: Exposure to natural hazards in Moria

Camp Name	Cold spell	Heatwave	Storm	Forest Fire	Earthquake	Tsunami
Moria	<p>-Freezing temperatures (Smith, 2017; Tagaris, 2017; Oxfam International, 2019:7)</p> <p>-No heating (Pazianou, 2018; Oxfam International, 2019:5; Gordon & Larsen, 2021:424)</p> <p>-Snowfall (Papadopoulos, 2017; Smith, 2017; Tagaris, 2017; Oxfam International, 2019:7; Rielly, 2020)</p> <p>-Deaths due to the cold (RRE, 2018:10; Rielly, 2020)</p> <p>-Dampness due to rainfall (Pazaianou, 2018; Oxfam International, 2019:7; Cordier, 2020)</p> <p>-Deaths due to dangerous heating devices in tents (Pallister-Wilkins, 2020:77)</p>	<p>-Extreme heat resulting in heat strokes and dehydration (MSF, 2017:9)</p>	<p>-Strong winds (Reidy, 2019)</p> <p>-Heavy rain during winter months (Oxfam International, 2019:7)</p> <p>-Increased risk of flooded tents in the olive grove due to insufficient drainage (RRE, 2018:36; Oxfam International, 2019:8; Reidy, 2019)</p> <p>-Destruction of tents due to heavy rain and wind (HRW, 2018; Oxfam International, 2019:7; Pallister-Wilkins, 2020:77)</p> <p>-One confirmed death from drowning under tent (RRE, 2018:10)</p>	<p>-11 fire ignition points within a 5km radius between 1970 - 2001 (Kalabokidis et al., 2005:147)</p> <p>-Forest fire risk classified as "extreme" (ERCC, 2020)</p>	<p>-Return period of 475 years for earthquake with intensity IX (violent shaking) on the Modified Mercalli Intensity Scale (Munich RE in EAEE, 2018:7)</p> <p>-6.3 earthquake in 2017 (TSUMAPS-NEAM, 2017)</p>	<p>-Low risk (not on the coast)</p>

⁶⁶ The content of the tables for Moria and Mavrovouni was confirmed by the interviews.

Table A4: Exposure to natural hazards in Mavrovouni

Camp Name	Cold spell	Heatwave	Storm	Forest Fire	Earthquake	Tsunami
Mavrovouni	<p>-Freezing temperatures (Rielly, 2021; UNHCR, 2021a:1)</p> <p>-No heating (Rielly, 2021)</p> <p>-Snowfall (UNHCR, 2021a:1)</p> <p>-More reported diseases (Wallis, 2021)</p> <p>-Sleeplessness (Cowles, 2020; Wallis, 2021)</p> <p>-No winter clothes (RSA, 2020)</p> <p>-Dampness after rainfall (RSA, 2020)</p>	<p>-Temperatures >40°C (GCR & Oxfam International, 2021a:1,4; González, 2021; LCL, 2021)</p> <p>-No shade to avoid heat (GCR & Oxfam International, 2021a:4; González, 2021; Le Lijour, 2021)</p> <p>-Dust development (Le Lijour, 2021)</p>	<p>-Winds up to 100km/h, especially during winter (Maud, 2021:1; Rielly, 2021)</p> <p>-Hail and strong winds resulting in power cuts (Mare Liberum e.V., 2021)</p> <p>-Flooding due to heavy rain and topography, especially in winter (Oxfam International, 2019:7; Cowles, 2020; UNHCR, 2020b; Watershed e.V., 2020; InfoMigrants & dpa, 2021; Pallister-Wilkins et al., 2021:91; Rielly, 2021; Wallis, 2021)</p> <p>-Collapsing tents due to wind, rain, and flooding (ANSA, 2020; HRW, 2020; INTERSOS, 2020; RSA, 2020; Wagner, 2020; InfoMigrants & dpa, 2021; UNHCR, 2021a:1; UNHCR, 2021c:2)</p> <p>-Inadequate flood protection and drainage infrastructure (Oxfam International & GCR, 2020:3; RSA, 2020; UNHCR, 2020b; Pallister-Wilkins et al., 2021:91; Rielly, 2021)</p> <p>-Sleeplessness due to wind (Cowles, 2020; Mare Liberum e.V., 2021)</p>	<p>-11 fire ignition points within a 5km radius between 1970 - 2001 (Kalabokidis et al., 2005:147)</p> <p>-Forest fire risk classified as "extreme" (ERCC, 2020)</p> <p>-Installations of highly flammable plastic containers without sufficient space in between (LCL, 2021)</p> <p>-No fire escape route for most remote camp area (LCL, 2021)</p>	<p>-Return period of 475 years for earthquake with intensity IX (violent shaking) on the Modified Mercalli Intensity Scale (Munich RE in EAEE, 2018:7)</p> <p>-5.0 earthquake in February 2021 (UNHCR, 2021c:2)</p>	<p>-Location on the coast. Risk from tsunamis as Lesvos has historically been affected (Karkani et al., 2022:5,11-12)</p>

Table A5: Exposure to natural hazards in Vathy and Vial

Camp Name	Cold spell	Heatwave	Storm	Forest Fire	Earthquake	Tsunami
Vathy	<p>-Freezing temperatures (Bird & Beattie, 2019:1; UNHCR, 2021c:1)</p> <p>-Higher infection rates (Samos Volunteers, 2021)</p>	<p>-Extreme heat >30°C (Bird & Beattie, 2019:1; IRC, 2020:28; Samos Volunteers, 2021)</p>	<p>-Strong winds and heavy rain, especially in winter (Bird & Beattie, 2019:1; Samos Volunteers, 2021; UNHCR, 2021c:1)</p> <p>-Destruction of tents due to heavy rain and wind (IRC, 2020:28; Samos Volunteers, 2021)</p> <p>-Hail (Bird & Beattie, 2019:2)</p> <p>-Constructed on steep hill turning muddy during heavy rain (Bird & Beattie, 2019:2)</p>	<p>-Forest fire risk classified as "extreme" (ERCC, 2020)</p>	<p>-Return period of 475 years for earthquake with intensity VII (very strong shaking) on the Modified Mercalli Intensity Scale (Munich RE in EAAE, 2018:7)</p> <p>-6.7 earthquake in October 2020 (Bathke, 2020; Sanderson, 2020; Volcano Discovery 2020)</p>	<p>-Low risk (not on the coast)</p>
Vial	<p>-Freezing temperatures (Cunniffe et al., 2019:30; UNHCR, 2021d:1)</p> <p>-Dampness due to rainfall (Cunniffe et al., 2019:37)</p>	<p>-Extreme heat (Cunniffe et al., 2019:30,34)</p>	<p>-Strong winds (UNHCR, 2021c:1)</p> <p>-Flooding of tents due to heavy rain (Cunniffe et al., 2019:37)</p>	<p>-Forest fire risk classified as "extreme" (ERCC, 2020)</p>	<p>-Return period of 475 years for earthquake with intensity VII (very strong shaking) on the Modified Mercalli Intensity Scale (Munich RE in EAAE, 2018:7)</p> <p>-6.3 earthquake in 2017 (TSUMAPS-NEAM, 2017)</p> <p>-Deadliest earthquake in Greek history (1881, 6.5) (Pavlidis et al., 2009:7)</p>	<p>-Low risk (not on the coast)</p>

A7. Policies Influencing Refugee Camp Planning

Table A6: International, European, and Greek policies

International	
<p>Universal Declaration of Human Rights (UDHR) (1948)</p>	<p>The UDHR constitutes the first standardized fundamental rights document (UN, 1948). In the context of risk assessments for natural hazards in refugee camp planning, the subsequent articles are especially relevant:</p> <p style="padding-left: 40px;"><i>Article 1: “All human beings are born free and equal in dignity and rights. [...]” (UN, 1948)</i></p> <p>Refugees and asylum seekers enjoy the same rights as Greek citizens and should be treated equally by authorities.</p> <p style="padding-left: 40px;"><i>Article 3: “Everyone has the right to life, liberty and security of person.” (UN, 1948)</i></p> <p>The lives of refugees and asylum seekers should be protected, and they should not deliberately be exposed to harm.</p> <p style="padding-left: 40px;"><i>Article 25: “Everyone has the right to a standard of living adequate for the health and well-being of himself and his family [...]” (UN, 1948)</i></p> <p>Shelter in refugee camps should provide protection from harmful events and support physical and mental health of residents. The thesis highlights the non-compliance with the declaration, and the respective need to assess risks during the process of refugee camp planning.</p>
<p>1951 Convention and 1967 Protocol Relating to the Status of Refugees</p>	<p>The 1951 Convention⁶⁷ defines refugees, their rights, and legal obligations of states (UN General Assembly, 1951). It is considered customary international law (UNHCR, n.d.d). While originally referring to those displaced by World War II, the 1967 Protocol generalized the regulations (UN General Assembly, 1967). The following articles are of relevance for the thesis:</p> <p style="padding-left: 40px;"><i>Article 3: “A refugee shall get fundamental rights and freedoms without discrimination.” (UN General Assembly, 1951:35)</i></p>

⁶⁷ Also referred to as the Geneva Convention.

	<p>The content is congruent to Article 1 in the UDHR.</p> <p>Article 21: <i>“As regards housing, the Contracting States, in so far as the matter is regulated by law or regulations or is subject to the control of public authorities, shall accord to refugees lawfully staying in their territory treatment as favourable as possible and, in any event, not less favourable than that accorded to aliens generally in the same circumstances.”</i> (UN General Assembly, 1951:115)</p> <p>Similar to Article 25 of the UDHR, this article determines the compliance with adequate standards of living for any displaced person by government authorities as states have the responsibility to protect everyone on their territory from harm. Humanitarian organizations support states in this process (CCCM Cluster, 2021:13).</p> <p>Article 35: <i>“The Contracting States undertake to cooperate with the Office of the United Nations High Commissioner for Refugees [UNHCR], or any other agency of the United Nations which may succeed it, in the exercise of its functions, and shall in particular facilitate its duty of supervising the application of the provisions of this Convention.”</i> (UN General Assembly, 1951:252)</p> <p>This article determines that states support the work of the UNHCR which supervises the compliance with the convention.</p>
Europe	
Convention for the Protection of Human Rights and Fundamental Freedoms (1950)	Translates the UDHR into European legislation (ECHR, 2021:5).
Charter of the Fundamental Rights of the European Union	Reaffirms the 1950 and 1951 Conventions (European Union, 2012:5,9).

(2012/C 326/02)	
Hotspot approach	<p>When numbers of asylum seekers surged in 2015, the EU inaugurated First Reception Centres, later renamed RICs, under the <i>hotspot</i> approach to support Italy and Greece. The objective was to process asylum applications in a manageable number of places and improve coordination of European and national stakeholders (EPC, 2019; EPRS, 2018:1; Karagiannopoulou et al., 2020:40-41; Oxfam International & GCR, 2020:1).</p> <p>In Greece, the RIS under the Ministry of Migration and Asylum, formerly the Ministry of Migration Policy, is legally responsible for the hotspot management, although the EU Commission, EASO/EUAA, Frontex, and Europol support them with funding and personnel (Cunniffe et al., 2019:11; SVR, 2021:19). The facilities consist of a refugee camp, an administrative compound, and, on some islands, a pre-removal detention facility (Ziebritzki, 2020). Design and management must comply with the Charter of the Fundamental Rights of the European Union (FRA, 2017a:3). After the EU-Turkey Statement in March 2016, Greece introduced geographic restrictions confining asylum seekers to RICs on the islands⁶⁸, shifting the focus to deportation (EPRS, 2018:4; Karagiannopoulou et al., 2020:42; Ziebritzki, 2020).</p> <p>A report from the European Court of Auditors in March 2017 criticized the absence of SOPs and a manager for each RIC, despite contrary commitments by the Hellenic Parliament (2016:30), resulting in ambiguous institutional responsibilities (Howden, 2020b:61). Moreover, the adoption</p>

⁶⁸ Exempt are admitted refugees, those eligible for family reunification under the *Dublin III* regulation, and asylum seekers classified as vulnerable (Karagiannopoulou et al., 2020:159).

		of the geographic restrictions gradually resulted in increasing overcrowding (GCR, 2020; IRC, 2020:5).
To enhance the Common European Asylum System, the subsequent directives were made as amendments to the 1951 Convention (Inter-Parliamentary Union & UNHCR, 2017:22).		
Council 2001/55/EC	Directive	<p>Prescribes “<i>minimum standards for giving temporary protection in the event of a mass influx of displaced persons and on measures promoting a balance of efforts between Member States in receiving such persons and bearing the consequences thereof</i>” (Council of Europe, 2001:1). Despite its applicability to the Greek response, the directive was not activated (Genç & Öner, 2019:2).</p> <p>Of specific relevance for the thesis are the following contents:</p> <ul style="list-style-type: none"> • Article 13: The obligation by member States to provide suitable accommodation (Council of Europe, 2001:5). “Suitable accommodation” is not clarified further. • The recognition of the UNHCR mandate regarding refugees and the requirement to consult with the UNHCR and other relevant international organizations on asylum policy issues (Council of Europe, 2001:2). • The requirement of a balance regarding costs and reception between member states (Council of Europe, 2001:2-3).
Directive 2013/33/EU of the European Parliament and of the Council (recast)		Also referred to as the Reception Conditions Directive. Defines “ <i>standards for the reception of applicants for international protection</i> ” (Council of the European Union, 2013:5; Mayer & Mehregani, 2016:36). The directive can be abrogated when Directive 2001/55/EC is applied during a mass influx (Council of the European Union, 2013:5). However, this was not implemented for Greece (Genç & Öner, 2019:2).

Regulation (EU) No 604/2013 of the European Parliament and of the Council (recast)	Also known as the Dublin III Regulation. Prescribes that the first country where an asylum application is lodged is responsible for processing it unless the asylum seeker entered from a safe third country, in which case they may be returned (Council of the European Union, 2013b:7).
Greece	
Law 4636/2019 on international protection and other provisions (succeeding law 4540/2018 ⁶⁹)	<p>Law 4636/2019 is also referred to as the <i>International Protection Act</i> (Pallister-Wilkins et al., 2021:65). The laws prescribe that reception conditions should ensure an adequate standard of living compliant with human dignity and the protection of physical/mental health (Ministry of Migration and Asylum, n.d.; Pallister-Wilkins et al., 2021:65).</p> <p>They determine the <i>Reception and Identification Service</i> (RIS) and <i>Directorate for the Protection of Asylum Seekers</i> (DPAS) under the <i>Ministry of Migration and Asylum</i>⁷⁰ as the responsible authorities for reception of asylum seekers (GCR, 2021b; Karagiannopoulou et al., 2020:152). The RIS decides about cooperation with EU bodies, international organizations, service providers, and civil society organizations. Moreover, it oversees the establishment and operation of reception facilities (Hellenic Parliament, 2016:24-27). The RIS has a separate budget from the Ministry of Interior. Funding may be used for studies. If necessary for the delivery of its services, the Ministers of Finance, Interior, and Administrative Reconstruction can decide to supply additional funding. Projects may also be financed by EU or national organizations (ibid:37).</p>

⁶⁹ This law, in turn, is an amendment to law 4375/2016 “*Organisation and functioning of the Asylum Service, Appeals Authority, Reception and Identification Service, establishment of General Secretariat for Reception, transposition of Directive 2013/32/EU of the European Parliament and of the Council ‘on common procedures for granting and withdrawing international protection (recast)’ (L180/29.6.2013), provisions on employment of beneficiaries of international protection*” (GCR, 2021b).

⁷⁰ Until July 2019, the RIS and DPAS were under the *Ministry of Migration Policy*. The ministry was closed after the July 2019 elections but reintroduced in January 2020 as the *Ministry of Migration and Asylum* (Karagiannopoulou et al., 2020:152).

		<p>According to the laws, vulnerable persons are supposed to receive particular attention and be accommodated in separate structures (Hellenic Parliament, 2016:29; Karagiannopoulou et al., 2020:154; Ministry of Migration and Asylum, n.d.).</p>
Ministerial 1299/2003	Decision	<p>Established the National Civil Protection Plan <i>Xenokrates</i> under the General Secretariat for Civil Protection (Politou et al., 2015:812). It prescribes guidelines for emergency management in Greece, defines operating procedures, and names the organizations responsible for prevention, preparedness, response, and recovery. Risk assessments are listed as a prevention tool (Xhelili et al., 2021:28; ΕΛΛΗΝΙΚΗΣ ΔΗΜΟΚΡΑΤΙΑΣ, 2003:3).</p> <p>According to <i>Xenokrates</i>, municipalities⁷¹, regions, and decentralized administration need to generate their own hazard and contingency plans. They are based on national hazard plans and require approval by the General Secretariat for Civil Protection. This is the responsible body for nationwide crisis management (Gimpelson et al., 2016:6-7; GSCP, 2015:8; Politou et al., 2015:810,813,821; Xhelili et al., 2021:28). In case of a local or regional emergency, the respective local or regional government authorities lead the response. The General Secretariat for Civil Protection manages national emergencies (GSCP, n.d.). Local disaster risk management is project-based and funded either by research projects or local authorities (Politou et al., 2015:818).</p>
Law 4662/2020 ⁷² on civil protection	(succeeding	<p>Formed the <i>National Crisis and Hazard Management Mechanism</i> (Nat-CHAMM) which makes risk assessments</p>

⁷¹ The Local Coordinating Body responsible for the implementation of *Xenokrates* consists of the mayor, two councilors, regional civil protection executives, a military commander, the police department commander, the head of the municipal police, the fire department commander, the head of the municipal and communal technical services, the head of forestry, and representatives of voluntary and social organizations (Politou et al., 2015:813).

⁷² “*National Crisis Management and Risk Management Mechanism, restructuring of the General Secretariat of Civil Protection, upgrading of Civil Protection Volunteering, reorganization of the Fire Brigade and other provisions.*” The law is specified in Government Gazette 27/A/7-2-2020 (Zacheilas & Papadakis, 2020:21).

Ministerial 1299/2020)	Decision	compulsory from the national to the local level (Gimpelson et al., 2016:6; Zacheilas & Papadakis, 2020:17,21-23). The Nat-CHAMM unites all civil protection organizations into one national system. Regional coordinating institutions were established to accelerate decision-making on regional and local levels. Context-specific risk assessments incorporating the Nat-CHAMM are now compulsory for emergency response plans and consequence management on the national, regional, and local levels. Both Xenokrates and the Nat-CHAMM prioritize the safety of human life from all potential hazards (Gimpelson et al., 2016:6; Zacheilas & Papadakis, 2020:17,21-23).
Agnodiki (2020)		To prevent “large” natural disasters in overcrowded reception facilities, the Ministry of Migration and Asylum developed the <i>Agnodiki</i> project. No additional information was found as it is classified (Papadatos-Anagostopoulos, 2020).

A8. Description of Lesvos

The Aegean Island is part of the Northern Aegean Islands Province (UrbiStat S.r.l., 2018) under the Decentralized Administration of the Aegean (Politou et al., 2015:804). It is located only 11km from the Turkish coast, making it a preferred destination for asylum seekers attempting to reach Europe (Jauhiainen, 2017:6-7; Kolasa-Sikiaridi, 2016).

Lesvos is characterized by a semiarid Mediterranean climate with warm, dry summers and mild, moderately rainy winters. The average precipitation is 670mm, and the average temperature 18°C. The topography of Lesvos is hilly (Kalabokidis et al., 2005:144-145). Common natural hazards are cyclical floods, flash floods, landslides, wildfires, and earthquakes (Kalabokidis et al., 2005:144; Repanelis et al., 2019).

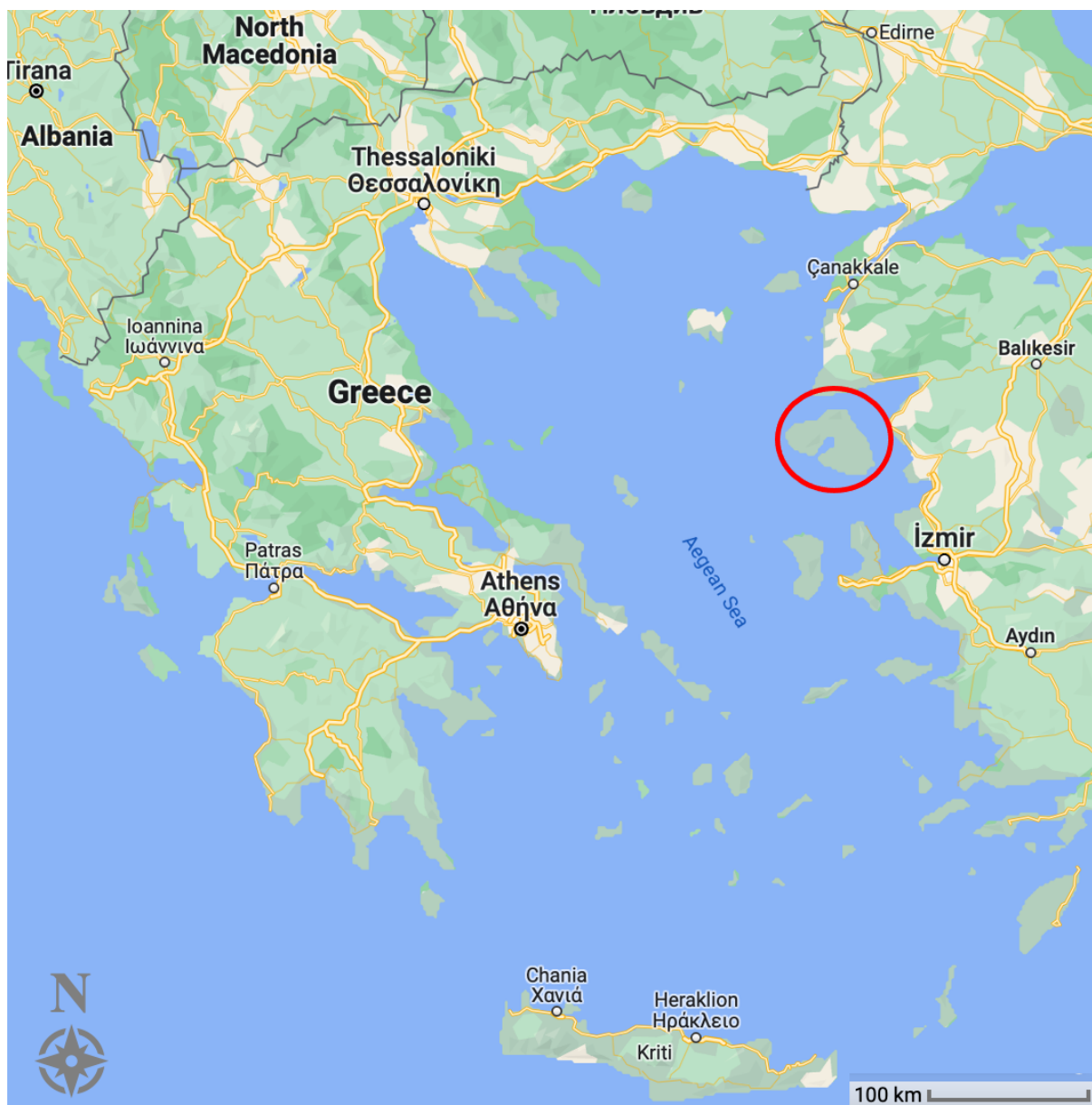


Figure A10: Map of Greece. The red circle shows the location of Lesvos (Modified from Google Maps, 2022).

A9. Humanitarian Charter, Protection Principles, and Core Humanitarian Standards

Humanitarian Charter

The Charter specifies the ethical and legal context for the Protection Principle, the Core Humanitarian Standard, and the HMSs in the Sphere Handbook (Sphere Association, 2018b:28). Its core values are based on the principles of humanity and the humanitarian imperative. In accordance with the Universal Declaration of Human Rights (cf. appendix 7), they stress the right to life, dignity, protection, and security by ensuring minimum standards, if necessary, through assistance, and the obligation to do everything possible to reduce suffering from disaster and conflict. It recognizes the leadership of nation states in emergency response and stresses the impartial involvement of international humanitarian actors only when national

capacities are overwhelmed. Moreover, it accepts the leadership roles of UN agencies and the International Committee of the Red Cross in humanitarian operations (ibid:28-29,32).

Protection Principles

The Sphere Handbook applies four protection principles based on the core values specified in the Humanitarian Charter (Sphere Handbook, 2018:34):

Principle 1: *Enhance people's safety, dignity and rights and avoid exposing them to further harm.*

Principle 2: *Ensure people's access to impartial assistance, according to need and without discrimination.*

Principle 3: *Assist people to recover from the physical and psychological effects of threatened or actual violence, coercion or deliberate deprivation.*

Principle 4: *Help people to claim their rights.*

Principle 1 is especially relevant for the thesis as it includes the notion of prevention by reducing risks, exposure, or vulnerability to threats. It stresses the imperative that people are not exposed to physical hazards during response operations. This requires iterative risk analyses with a focus on intersectionality to understand the risk context in a dynamic environment. When policies or official activities impede these objectives, humanitarian organizations should advocate for a change of practice (ibid:37-38).

Core Humanitarian Standards

The Standards include nine commitments (cf. figure A11) clarifying roles and responsibilities in humanitarian response operations (Sphere Association, 2018b:5). Each commitment is accompanied by a set of indicators examining its realization. Two aspects especially relevant for the thesis are:

Commitment 1, Indicator 2: *The assistance and protection provided correspond with assessed risks, vulnerabilities and needs.* (ibid:54)

Commitment 3, Key Action 3.2: *Use the results of any existing community hazard and risk assessments and preparedness plans to guide activities.* (ibid:60)

Achieving Key Action 3.2 additionally requires a vulnerability and needs assessment to identify high-risk groups. Moreover, Commitment 4 demands access to risk assessment results for camp residents (ibid:60,63-64).

In these commitments, the Humanitarian Standards specifically refer to risk assessments as a necessary basis for efficient response operations, and the responsibility of humanitarian organizations to assert risk assessment and management (ibid: 84A8). This is congruent to the identification of valuable assets in the context description of risk assessments.



Figure A11: The nine commitments of the Core Humanitarian Standards (Sphere Association, 2018b:50)

A10. Pressure-and-Release Model

According to the Pressure-and-Release (PAR) model, risk is created through the interaction of hazards and vulnerability. The latter emerges from the trajectory root causes > dynamic pressures > unsafe conditions (cf. figure A12). “Releasing” pressure on risk presupposes a reduction of vulnerable conditions in either of the three steps (Wisner et al., 2004:50-51).

Root causes refer to general social processes such as power, resources, structures, the political and economic system, culture, or ideologies. Of these, power is the most relevant, as it creates the basis for all other factors (ibid:51-52). The root causes result in dynamic pressures, such as lacking capacities, institutions, or investments; inadequate ethical standards; or population changes (ibid:51,53). Finally, they lead to unsafe conditions, such as unsafe physical environments or buildings, insecure livelihoods, discrimination against certain groups, or lacking disaster preparedness. All these factors shape vulnerability in the studied cases (ibid:51,53- 55).

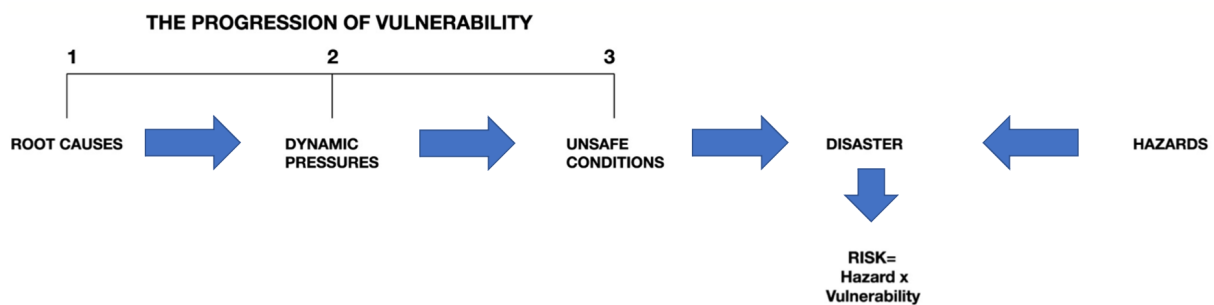


Figure A12: Pressure-and-Release Model (Modified after Wisner et al., 2004:51)