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The international legal framework
on nuclear energy for peaceful uses:
a human rights and environmental law perspective.

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Abstract

Il tema della produzione di energia nucleare per scopi civili è estremamente controverso. Essa è considerata un'attività ad alto rischio per i pericoli legati a incidenti e fughe di radiazioni che interessano tutte le fasi del cosiddetto *fuel cycle*, perciò necessita di un quadro normativo forte e puntuale che ne regoli i differenti aspetti. Questa necessità si concretizza nell'applicazione delle norme e principi appartenenti alla sfera del *International Disaster Response Law* (IDRL) e *International Nuclear Law* (INL).

International Disaster Response Law si può considerare come una branca a sé stante del diritto internazionale di recente sviluppo, malgrado la comunità internazionale si sia occupata degli effetti e delle conseguenze di disastri sin dall'inizio del ventesimo secolo. Essa ha a che fare con la definizione di norme concernenti la regolazione delle differenti fasi legate a disastri (dalla prevenzione e riduzione del rischio alla fase di ricostruzione) di qualsiasi origine e natura, come un incidente nucleare. Tuttavia, proprio il suo recente progresso, ha portato l'IDRL ad avere uno sviluppo frammentario, non coordinato e con molte aree grigie. Questa situazione dà luogo a due maggiori problemi che mettono a rischio il raggiungimento dell'obiettivo principale della branca dell'IDRL, cioè la prevenzione o minimizzazione delle conseguenze legate a disastri sulla popolazione e l'ambiente. Il primo problema fa riferimento alla mancanza di doveri e obblighi ben definiti a livello internazionale che causano l'impossibilità di delineare precise responsabilità, come nel caso della possibile presenza del dovere di richiedere o accettare assistenza internazionale in specifiche circostanze di bisogno; secondo, sempre per l'assenza di un quadro giuridico chiaro a livello internazionale che definisca obblighi e doveri, problemi di regolazione possono emergere a livello nazionale nella forma di una mancata preparazione ad affrontare situazioni di emergenza, adeguata coordinazione e controllo delle forze assistenziali in campo, facilitazione delle operazioni di soccorso e aiuto, e delineamento di piani emergenziali ben organizzati e sviluppati per la gestione e minimizzazione degli effetti di disastri. Questo carattere frammentario dell'IDRL è alla base del lavoro da parte della Commissione del Diritto Internazionale che ha redatto un progetto di articoli sulla protezione delle persone in caso di disastri con lo scopo di fornire un concreto punto di partenza per lo sviluppo di un trattato internazionale che definisca norme, principi, obblighi e doveri chiari.

Tuttavia, a causa delle peculiarità del settore della produzione di energia nucleare, che risulta essere estremamente tecnico, e degli specifici rischi e conseguenze legate alla fuga di radiazioni,

caratteristica che distingue gli incidenti nucleari dalle altre forme di emergenze, è emerso un quadro normativo completo e relativamente puntuale che definisce standard, principi, pratiche e regole per la regolazioni internazionale di tutte le fasi e operazioni legate alla produzione di energia nucleare per scopi civili. Questo insieme di strumenti ha dato vita al regime dell'*International Nuclear Law*. Questo, occupandosi anche della prevenzione e gestione di emergenze o incidenti nucleari può essere considerato come una sotto-branca specializzata dell'IDRL. L'INL e gli strumenti ad esso appartenenti si basano su alcuni principi cardine tra cui quelli di sviluppo sostenibile, indipendenza delle autorità regolatrici nazionali, trasparenza e cooperazione internazionale. Focalizzando l'attenzione sui principali trattati internazionali, essi si occupano di definire regole precise sulla sicurezza delle centrali nucleari (Convenzione sulla sicurezza nucleare), sicurezza e gestione delle scorie nucleari e combustibile esaurito (Convenzione congiunta sulla sicurezza della gestione del combustibile esaurito e sulla sicurezza della gestione dei rifiuti radioattivi), protezione da sabotaggio, accesso non autorizzato ai siti e centrali nucleari, furto, trasferimento illegale di materiale nucleare (Convenzione sulla protezione fisica delle materie nucleari e degli impianti nucleari), preparazione ad affrontare emergenze o incidenti nucleari e gestione di tali situazioni critiche (Convenzione sulla tempestiva notifica di un incidente nucleare e Convenzione relativa all'assistenza in caso di incidente nucleare e di situazioni di emergenza radiologica), e sulla responsabilità civile. Tutti questi trattati hanno portato a un notevole progresso in materia di sicurezza e gestione delle emergenze, ma riflettono ciò che è stato possibile raggiungere nell'ambito di un settore considerato come strategico dagli stati nazionali e per cui, di conseguenza sono riluttanti ad accettare una forte regolazione a livello internazionale. Per questo motivo, si possono individuare limiti e punti deboli. Ciò che si può affermare è che lo sviluppo e rafforzamento di tali strumenti è stato fortemente influenzato dagli incidenti nucleari di Fukushima e soprattutto di Chernobyl che ha drammaticamente dimostrato come il rafforzamento del regime di regolazione delle attività legate alla produzione di energia nucleare fosse indispensabile, dando così il via a negoziazioni internazionali che hanno poi portato alla ratifica della maggior parte dei trattati internazionali in materia.

Sia nel caso di Chernobyl che di Fukushima, all'origine del disastro può essere individuata un'importante responsabilità delle autorità sovietiche e giapponesi che in entrambi i casi si può riassumere con un la presenza di una condotta negligente che ha portato, *in primis*, alla violazione del principio consuetudinario di buon vicinato che essendo in principio di *due diligence* implica un'attenzione molto forte sulla prevenzione o minimizzazione di danni transfrontalieri. Come

affermato in precedenza, il disastro nucleare di Chernobyl è stato il punto di partenza per la definizione di trattati internazionali riguardo la sicurezza, gestione delle emergenze e assistenza, ma ha anche portato alla definizione del concetto di *safety culture* e ha contribuito fortemente alla costituzione del obbligo di notifica di possibili danni transfrontalieri come principio consuetudinario. L'incidente nucleare di Fukushima, che è avvenuto in un contesto giuridico completamente differente rispetto a quello di Chernobyl dato che nei venticinque anni che li separano è venuto a crearsi un complesso di norme e principi appartenenti alle sfere dell'IDRL e INL, ha immediatamente riaperto la questione della sicurezza nucleare, tema che è stato discusso durante varie conferenze che hanno avuto luogo nei mesi immediatamente successivi all'incidente. Inoltre, ciò che è accaduto a Fukushima ha avuto, in concorso con altri fattori, un forte considerevole sull'industria mondiale del nucleare.

I sopracitati disastri hanno anche tristemente evidenziato come il rispetto e la protezione di diritti umani fondamentali sia messa a repentaglio dalla mancanza di preparazione da parte delle autorità statali ad affrontare possibili situazioni critiche e dalla mancanza o non applicazione di un adeguato apparato di regolazione e sorveglianza delle attività, negligenze per le quali può essere invocata la responsabilità internazionale dello stato per il fallimento dell'obbligo di proteggere e rispettare i diritti umani fondamentali codificati nelle varie convenzioni sia a livello regionale che internazionale. La mancanza di preparazione ad affrontare un disastro nucleare, ha portato, nei casi degli incidenti di Chernobyl e, in particolare, di Fukushima, alla violazione del diritto alla vita, del diritto di godere del migliore stato di salute possibile (i quali nel caso di esposizione non dovuta ed eccessiva a radiazioni sono strettamente collegati), diritto a non essere sottoposti a trattamenti inumani o degradanti ed altri, incluso il diritto ad un ambiente sano, malgrado tale diritto non sia ancora riconosciuto come un diritto indipendente e riconosciuto a livello internazionale; tuttavia, esso risulta attualmente riconosciuto da numerose costituzioni nazionali, trattati regionali sull'ambiente e accordi regionali sui diritti umani.

Infine, il tema del nucleare risulta controverso anche dal punto di vista del dibattito sul cambiamento climatico. Infatti, malgrado si tratti di un tema su cui sono presenti pareri e analisi contrastanti soprattutto sulla valutazione di quanto l'energia nucleare possa essere considerata come una forma di energia pulita, ci sono valide argomentazioni, legate in particolare a fattori di costo, tempi di costruzione, sicurezza e affidabilità della continuità di fornitura di energia e rischi per popolazione e ambiente che portano a considerare il nucleare come un'arma poco utile nella lotta al cambiamento climatico: essa non assicurerebbe una riduzione rapida delle emissioni di CO₂,

come raccomandato anche dal Gruppo intergovernativo sul cambiamento climatico. In questo senso, con riferimento al caso Urgenda della Corte Suprema Olandese, se gli stati dovessero fare affidamento sullo sviluppo di centrali nucleari per la riduzione delle emissioni di CO2 provenienti dal settore energetico, le corti nazionali potrebbero ordinare allo stato di impegnarsi di più nella lotta al cambiamento climatico, in nome del rispetto e protezione dei diritti umani.

In ultimo luogo, la produzione di energia nucleare entra in una catena di relazioni negative con gli effetti del cambiamento climatico e la condizione femminile: le centrali nucleari sono sempre più vulnerabili agli effetti del cambiamento climatico che aumenta così il rischio di emergenze e situazioni problematiche che possono sfociare in incidenti; in secondo luogo, l'incidente di Fukushima ha messo in luce come le donne siano coloro che soffrono di più in caso di disastri nucleari, la cui probabilità aumenta all'aumentare di eventi atmosferici di eccezionale portata, sia a causa di negligenze nella gestione degli effetti di un incidente che per questioni biologiche; infine, dal momento che il nucleare non dà un apporto immediato e significativo alla riduzione delle emissioni, gli effetti del cambiamento climatico continuano ad aggravarsi anche a causa della presenza del meccanismo di inerzia climatica e le donne, soprattutto coloro che vivono nel cosiddetto *global south*, soffrono maggiormente le conseguenze che ne derivano per effetto della presenza di ruoli di genere che vedono la donna come colei che deve occuparsi della casa e della cura della famiglia, e fattori socio-culturali.

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Introduction

The production of nuclear energy, even for civil and peaceful uses, has always been an extremely controversial issue and has attracted the skepticism and criticisms of a wide portion of the international civil society. The inception of the nuclear era, in the field of energy production for non-military applications, can be traced back to 1953 when the US President Dwight D. Eisenhower addressed his landmark “Atoms for peace” speech to the United Nations General Assembly on the 8th December¹. The idea behind Eisenhower’s speech was that it was possible “to move out of the dark chamber of horrors into the light, to find a way by which the minds of men, the hopes of men, the souls of men everywhere, can move forward towards peace and happiness and well-being”²: nuclear energy could be a valuable resource instead of a threat. Two years later, the first nuclear power plant entered into operation in the US city of Arco (Idaho)³. However, nuclear energy has always been considered as a threat by many because of multiple reasons: first of all, it was perceived as an incumbent danger for humans’ health and the environment; second, the association between nuclear energy production, though for civil utilizations, and the development of nuclear weapons never ceased to exist: a close connection between the two spheres was constantly present⁴. As a consequence, especially from the 70s, a strong anti-nuclear energy movement became more and more established. It can be considered as a global social movement with national or local peculiarities that managed to raise awareness about the risks entailed in the production of nuclear energy, and in a number of specific circumstances, because of favorable structural and political factors, it succeeded in influencing the States’ nuclear policies and international regulation⁵. These successes that the anti-nuclear movement managed to attain are due to a range of different factors and two of them are worth being mentioned: first, it always tried to substantiate their claims with scientific evidence and obtained the support of scientists; second, empirical incidents, such as the Three Miles Island, and especially, some years later, the Chernobyl nuclear accident, demonstrated, or better reminded the whole world (with reference to Hiroshima and Nagasaki) how risky and

¹ IAEA. (n.d.). *Atoms for peace speech*. Available at: <https://www.iaea.org/about/history/atoms-for-peace-speech>. (accessed: 22 April 2021)

² IAEA. (n.d.). *Atoms for peace speech*. Available at: <https://www.iaea.org/about/history/atoms-for-peace-speech>. (accessed: 22 April 2021)

³ Poe D. (2010). ‘Antinuclear Power Protests in the United States’, in *Philosophy Faculty Publications, University of Dayton*, Vol.11, p. 67.

⁴ Ibid.

⁵ Litmanen T. (1998). ‘International anti-nuclear movements in Finland, France and the United States’, in *Peace Research*, Vol. 30, No. 4, pp. 2-3.

dangerous nuclear energy is, and how safety is a primary concern when it comes to nuclear energy production⁶.

These concerns came back to the fore recently due to the Fukushima catastrophe, but also in connection to the lively international debate on climate change and sustainable development where a sharp opposition between two factions can be identified: some scientists and politicians consider nuclear energy as an important tool to address climate change, being a low-emission energy source, while others keep stressing the risks it entails for living beings and the environment, and refute the idea that it is a low-emission energy source: they put forward the time factor in order to demonstrate how the development of the nuclear energy sector is not the right way to fight climate change and promote sustainable development⁷.

Starting from this background, this dissertation aims at delving into two main aspects linked to nuclear energy production for civil uses: the first objective has the purpose of analyzing how it is regulated at the international level, namely which are the international instruments relevant for the regulation of nuclear energy production and for the minimization of the risks connected to it are, how the regulation evolved overtime, and whether today the legal framework can be considered as satisfactory or some shortcomings, gaps and/or inconsistencies can be identified; second, it aims at describing the human rights and environmental implications of nuclear energy production where, in particular, the human-rights side is analyzed through the lenses of the Chernobyl and Fukushima nuclear catastrophes.

The themes linked to these main objectives are tackled in five different chapters: Chapter 1 is devoted to the analysis of the branch of International law called International Disaster Response Law that, dealing with the regulation of the different phases of a disaster situation (from prevention and risk minimization, to disaster management and reconstruction), is relevant for the study of the regime surrounding nuclear energy production because of the risks of accidents it entails; Chapter 2 focuses more narrowly on the principles and instruments pertaining to the branch of International Nuclear Law that specifically regulate the field of nuclear energy production; particular attention will be paid to the examination of the main international conventions that deal with nuclear

⁶ Ibid., pp. 14-16.

⁷ See e.g. IAEA. (2020). *Climate Change and Nuclear Power 2020*. Vienna: IAEA, p.1.; Barnham K. (2015). *False solution: Nuclear power is not 'low carbon'*, *Ecologist – the journal for the post-industrial age*. Available at: <https://theecologist.org/2015/feb/05/false-solution-nuclear-power-not-low-carbon> (accessed: 5 September 2021); Bezanson D. (2019). *7 Reasons... Nuclear power and climate change*, Sierra Club Grassroots Network. Available at: <https://content.sierraclub.org/grassrootsnetwork/team-news/2019/06/7-reasons-nuclear-power-and-climate-change> (accessed: 6 September 2021); Larsen T. (22nd August 2020). 'Nuclear Energy Is Not a Climate Solution: Response to Gary S. Was and Todd R. Allen', in *New Labor Forum*, Vol.29, No.3, pp.19-23.

security, nuclear safety, emergency preparedness and response, and liability for nuclear damage. Subsequently, Chapter 3 introduces the two main accidents that affected the history of nuclear energy production, namely those of Chernobyl and Fukushima. It aims, first, at demonstrating whether the Soviet and Japanese authorities can be held responsible for the outbreak of the two catastrophes, and second at describing how they impacted the nuclear regime and industry. Chapter 4, always departing from the Chernobyl and Fukushima experiences as empirical manifestations and examples of the risks associated with nuclear energy production, carries out an analysis of the fundamental human rights that are jeopardized or violated in the context of a nuclear accident because of the State authorities' unpreparedness to prevent and properly face the immediate consequences of an accident, a lack of due diligence that might lead to the identification of the responsibility of the State. Finally, Chapter 5 turns its attention to the problem of climate change and considers whether nuclear power can serve as a valuable tool to fight and address it, concluding that, despite the persistence of uncertainty and opposing views, there are convincing arguments about the fact that the development of the world nuclear industry is not the right solution to oppose climate change, also in light of the concept of sustainable development and human rights protection.

Chapter 1

International Disaster Response Law: a body of rules for prevention of, management and recovery from natural and man-made disasters.

1. Introduction to International Disaster Response Law (IDRL).

The production of nuclear energy for peaceful uses is considered an ultrahazardous activity for the very significant risks it involves. As a consequence, it requires exceptional attention in its management, since possible accidents can have catastrophic consequences. This type of activity thus necessitates a high level of preparedness in order to face properly the consequences of an accident and minimize its negative effects, but most importantly much attention must be paid to prevention. For these reasons, the activity of production of nuclear energy falls in the sphere of interest of International Disaster Response Law (IDRL), that deals with the regulation of all the different phases linked to a situation of disaster, like a nuclear accident. This first chapter aims at generally introducing and analyzing the pillars, key concepts and major challenges pertaining to IDRL.

The international community has been concerned by the effects and consequences of natural and man-made disasters since the beginning of the twentieth century. Evidence of this is, for instance, the creation of the International Relief Union that was officially established on 12th July 1927⁸; however, International Disaster Response Law, as a field of International Law in its own right, started to develop extensively in recent decades.

As far as a precise scholarly definition of IDRL is concerned, Reinecke defines it as

[...] the body of rules and principles for international humanitarian assistance in the wake of peacetime disasters of natural, technological or industrial origin. As a body of law, IDRL is necessary to fill the gap left by International Humanitarian Law (IHL) [...]. Unlike IHL, IDRL applies to (usually) unintended disasters in a cooperative peacetime context when states or intergovernmental humanitarian or other organizations offer, request, provide or accept cross-border disaster assistance⁹.

⁸ De Guttry A. (2012) 'Surveying the law' in de Guttry et al. (eds.) *International Disaster Response Law*. 1st edn. The Hague: T.M.C. Asser Press, p. 33.

⁹ Reinecke I. (2010). 'International Disaster Response Law and the Coordination of International Organizations', *The ANU Undergraduate Research Journal*, Vol.2, pp. 143-162.

Nevertheless, considering the most recent developments in the field of IDRL, including the approach taken by the International Law Commission (ILC) in the drawing-up of the Draft Articles on the Protection of Persons in the Event of Disasters, this definition seems too narrow: it focuses on the emergency phase while IDRL is increasingly turning its attention to all aspects of the disaster cycle; for this reason, it can be argued that IDRL “has moved from a strong focus on disaster response and relief, towards a more holistic view of the role of law in disaster prevention and management”¹⁰.

Before delving into the specific content of IDRL, it is fundamental to explore another concept, namely that of disaster. It is not easy to provide a clear definition of disaster due to the complexity and variety of aspects it entails (severity of the consequences, duration, involvement of a single country or more, difference between single and complex emergencies, forms they can take e.g. hurricanes, earthquakes, floods, nuclear accidents, oil spills) and the difficulty to propose a well-defined categorization of the nature of disasters, namely an unequivocal separation between man-made activities and natural menaces¹¹. For this reason, a universally-accepted definition of the term *disaster* does not exist in international law¹². However, if we consider the relevant treaties and conventions which contain a definition of the term, it is possible to realize how they are all quite similar and stress three main elements: a disaster (a) is caused either by natural or man-made phenomena, (b) it brings about damage, injuries and/or losses and (c) those who are badly affected by it are the environment, properties and/or people. In addition to these three common elements, the Tampere Convention and the ILC Draft Articles on the Protection of Persons in the Event of a Disaster add another point to the definition that is the presence of a serious disruption of the functioning of society¹³.

Putting together all the pieces of what has been said so far, it is possible to outline the boundaries of IDRL. First, regarding the applicability *ratione temporis*, it applies to peaceful situations, thing that separate IDRL from IHL, and during all the phases of the disaster cycle, from disaster risk reduction to rebuilding; second, regarding the application *ratione materiae*, it includes both man-made and

¹⁰ Aronsson-Storrier M., da Costa K. (2017). ‘Regulating Disasters? The role of international law in disaster prevention and management’, in *Disaster Prevention and Management*, Vol.26, No.5, p. 502.

¹¹ Bartolini G. (2017). ‘A universal treaty for disasters? Remarks on the International Law Commission’s Draft Articles on the Protection of Persons in the Event of Disasters’, in *International Review of the Red Cross*, Vol.99, No.3 p. 1112; and Valencia-Ospina E. (2008). Preliminary Report on the Protection of People in the Event of Disasters, UN Doc. A/CN.4/598, p.153.

¹² Valencia-Ospina E. (2008) Preliminary Report on the Protection of People in the Event of Disasters, UN Doc. A/CN.4/598, p.152.

¹³ De Guttry A. (2012). ‘Surveying the law’ in de Guttry et al. (eds.) *International Disaster Response Law*. 1st edn. The Hague: T.M.C. Asser Press, pp. 6-7.

natural disasters leading to “a serious disruption of the functioning of society, posing a significant, widespread threat to human life, health, property or the environment”¹⁴; lastly, the application *ratione personae* of IDRL of course targets people and states affected by the disastrous events¹⁵.

This said, the most important and fundamental underlying principles of IDRL are coordination and cooperation. This derives from the strong acknowledgment that when the impact of disasters exceeds national capabilities, the international community is called upon to respond in a timely and effective manner, with the aim of minimizing the consequences on the population and the environment. Moreover, in line with the recent and increasing attention directed to Disaster Risk Reduction, coordination and cooperation are firmly needed also to devise plans, strategies and programmes of disaster prevention and education.

The significance attached to the need to cooperate is reflected in many preambles of international treaties in the field; to make an example, the preambles of the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency and Convention on early notification of a Nuclear Accident affirm that States parties to the convention desire “to strengthen further international cooperation in the safe development and use of nuclear energy” and are “convinced of the need for an international framework which will facilitate the prompt provision of assistance in the event of a nuclear accident”¹⁶. Along similar lines, though dealing with different issues, are the Tampere Convention, the Convention on the Transboundary Effects of Industrial Accidents, the Framework Convention on Civil Defence Assistance and many other binding and non-binding instruments that fall in the realm of IDRL¹⁷.

In promoting and stressing the need to build and intensify cooperation, the UNGA played a critical role. In this regard, there are two resolutions in particular that are worth being mentioned: Resolution 46/182 of 1991 (Strengthening of the co-ordination of humanitarian emergency assistance of the United Nations) that can be considered as a milestone in the development of IDRL and in reiterating the urgency of building more cooperation among all relevant subjects implicated in emergency response and management, and Resolution 65/157 of 2010 which, 20 years later, reaffirmed, among the other things, “[...] the importance in this regard of the continued cooperation

¹⁴ Tampere Convention on the Provision of Telecommunication Resources for Disaster Mitigation and relief Operations, Art.1 ‘Definitions’.

¹⁵ Caron D. D., Kelly M. J., Telesetsky A. (2014). *The International Law of Disaster Relief*, Cambridge: Cambridge University Press, pp. 24-27.

¹⁶ Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, Preamble.

¹⁷ Fisher H. (2003) ‘International Disaster Response Law Treaties: Trends, Patterns and Lacunae’ in IFRC, *International disaster response laws, principles, and practice: reflections, prospects and challenges*. Geneva: International Federation of the Red Cross and Red Crescent Societies, p. 33.

and coordination of stakeholders at all levels with respect to addressing effectively the impact of disasters”¹⁸, after having expressed its concerns for the rising scale of disasters that put additional stress on Member States’ capacities and preparedness to face them¹⁹.

Always considering the activity of the UNGA in incentivizing progresses in the field of IDRL, another landmark document is Resolution 42/169 of 1987 that launched the International Decade for Natural Disaster Reduction with the goal of urging the international community to take further steps in order to reduce the impact of natural disasters. Of course, the different actors of the international system did not focus solely on natural disasters but on both natural and man-made disasters, also in consideration of the then-recent Chernobyl nuclear accident which made clear that technological disaster can equally bring along suffering and fatal consequences.

1.1. The structure and content of IDRL

We have seen how the last three decades witnessed a rapid acceleration in the evolution of this domain; however, according to many, it occurred “in a confused and uncoordinated manner’, [and] the result is ‘a rather scattered and heterogeneous collection of instruments’”²⁰, that has given rise to a fragmented legal framework fraught with inconsistencies, overlaps and sometimes gaps. IDRL is both characterized by a bottom-up and top-down approach: the latter aims at the drawing-up of universal, multilateral or bilateral treaties and even soft law instruments; the former has the goal of providing direction, mainly through the development of guidelines, with the aim of creating common practice by translating the principles incorporated in guidelines into regional, national and/or local legal systems in order to enhance disaster response management and operations, as well as to create more homogeneity. This approach is strongly supported by the International Federation of the Red Cross and Red Crescent Society that developed the IDRL guidelines for the Domestic Facilitation and Regulation of International Disaster Relief and Initial Recovery Assistance, and Model Act²¹.

¹⁸ UNGA (2010). Resolution adopted by the General Assembly on 20 December 2010 – International Strategy for Disaster Risk Reduction, A/RES/65/157, p.4, para 9.

¹⁹ Ibid, p.2.

²⁰ Bartolini G., Natoli T. (2018) *Disaster Risk Reduction: an International Law Perspective*, QIL, Zoom-in. Available at: <http://www.qil-qdi.org/disaster-risk-reduction-international-law-perspective/> (accessed: 28 November 2020).

²¹ Heath J. B. (2011). ‘Disasters, Relief, and Neglect: the Duty to Accept Humanitarian assistance and the Work of the International Law Commission’, *the New York University Journal of International Law and Politics*, Vol.43, No.2, pp. 443-447.

A more careful analysis of the instruments that fall in the realm of IDRL allows to appreciate its articulation, fragmentation and complexity. It comprises a very high number of regional, multilateral and bilateral treaties²², so it is a system characterized by a multi-level structure but more often than not the different levels are uncoordinated. In addition, these treaties cover a very wide range of different disaster situations and issues, from the exchange of information (e.g. Tampere Convention and Early Notification Convention) to satellite imaging (e.g. Charter On Co-operation to Achieve the Coordinated Use of Space Facilities in the Event of Natural or Technological Disasters), or the delivery of humanitarian aid (e.g. Food Aid Convention). This gives an idea of the broad set of activities and measures that fall under the label of disaster response. Nevertheless, what makes IDRL so intricate is the fact that, apart from the wide range of issues tackled, the majority of treaties, whose purpose consists in outlining the rules governing international assistance and cooperation in disaster situations, either in specific fields (e.g. communication, food supply, military personnel etc.) or more generally, provide information on the management of emergency operations (e.g. provision of data, request of assistance, division of costs, movement of relief personnel across the State borders, issuance of visas, and so forth) without referring to each other, so they are developed in an uncoordinated, piecemeal and often conflicting way; this is problematic because the provision of timely and coordinated international assistance (when necessary) is the fulcrum of IDRL since it allows to meet the final purpose of IDRL, namely the minimization of the impact of disasters on the population as well as on the environment. In addition, it should be said that regional and bilateral treaties are more and more insufficient means to address the challenges posed by disasters of an increasing scale²³. It has to be added that conventions at all the different levels can deal with natural and/or man-made disasters in an all-encompassing way or, alternatively, they can address very specific circumstances like nuclear accidents or floods, and they can even have a specific geographic application, meaning that, for instance, they apply only to adverse events that occur at sea or in specific regions²⁴. Another source of complication comes from the varied degree of detailedness of the international treaties: from generic framework conventions to very particularized ones. In brief, the risk is that all these treaties, with different spheres of application and specificity, can deal with partially or totally overlapping issues but in a contradictory manner. To further complicate

²² De Guttery, writing in 2012 in *International Disaster Response Law*, affirmed that there were more than 200 international treaties.

²³ Bartolini G. (2017). 'A universal treaty for disasters? Remarks on the International Law Commission's Draft Articles on the Protection of Persons in the Event of Disasters', in *International Review of the Red Cross*, Vol.99, No.3, p.1105.

²⁴ De Guttery A. (2012).). 'Surveying the law' in de Guttery et al. (eds.) *International Disaster Response Law*. 1st edn. The Hague: T.M.C. Asser Press, p.11.

the picture, it is necessary to add reference to the multitude of soft law instruments that are present in this field. In addition to the aforementioned IDRL Guidelines and Model Act, and the different UNGA Resolutions on the matter, three instruments must be mentioned: first, the “Sendai Framework for Disaster Risk reduction 2015-2030” which, indicating “seven clear targets and four priorities for action to prevent new and reduce existing disaster risks [...], aims to achieve the substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries over the next 15 years”²⁵. It replaced the “Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters”, adopted at the World Conference on Disaster Reduction held in 2005 in Kobe which set the “priorities for action” in the context of disaster risk reduction for the period 2005-2015²⁶. Then, of primary importance, though not exclusively pertaining to IDRL, are also the 17 Sustainable Development Goals (SDGs) that are part of the 2030 Agenda for Sustainable Development adopted in 2015 at the UN Sustainable Development Summit that substituted the Millennium Development Goals. In adopting them, all States recognized the close link between the attainment of the SDGs and the good management and prevention of calamitous events; consequently, they pledged that they were ready to “strengthen cooperation [...] and to promote resilience and disaster risk reduction”²⁷. Lastly, from 2007 the International Law Commission has worked on the Draft Articles on the Protection of Persons in the Event of Disasters with the purpose of “[facilitating] the adequate and effective response to disasters, and reduction of the risk of disasters, so as to meet the essential needs of the persons concerned, with full respect for their rights”²⁸. Despite being non-binding, the Draft Articles can be, in a sense, distinguished from the abovementioned soft law instruments because the ILC decided “to recommend to the General Assembly the elaboration of a convention on the basis of the draft articles on the protection of persons in the event of disasters”²⁹. So, the Draft articles are soft law but at the same time they constitute a meaningful attempt of bringing to life an all-embracing universal convention with the objective of filling the gaps in the field of IDRL, bring order

²⁵ UNDRR (2015). Sendai Framework for Disaster Risk reduction 2015-2030.

²⁶ See UN/ISDR (2007). Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters, p.5.

²⁷ See UN (n.d.). Transforming the World: the 2030 Agenda for Sustainable Development.

²⁸ ILC Draft Articles on the Protection of Persons in the Event of Disasters, Article 2.

²⁹ ILC (2016). Report, Sixty-eight session (2 May-10 June and 4 July-12 August 2016), Supplement No.10 (A/71/10), p.34.

and coherence and solve the pitfalls of a piecemeal approach, since currently there is no such kind of binding instrument.

What has been described so far contributed to highlight the fragmented nature of IDRL that leads to inconsistencies, gaps and overlaps. Nevertheless, what is important to stress is not this fragmentation *per se*, but its consequences. The presence of gaps and/or overlaps, that cause uncertainty in how to undertake actions, plays against the fundamental requirements of coordination, promptness, efficiency and effectiveness that are essential to prevent and mitigate the effects of disasters on people and the environment. The lack of these essential conditions only leads to the worsening of already critical situations, further suffering and damage. As a consequence, it is imperative to provide more clarity and uniformity and the appeal of ILC to UNGA was made with this purpose in mind.

1.2. The relationship between IDRL and other branches of International law.

Since International Disaster Response Law comprises such an ample range of issues and circumstances, it inevitably intersects with other branches of International Law, like International Migration Law, and International Law concerning space, civil defence, telecommunications, privileges and immunities. In particular, in light of the topics that will be tackled in the next sections and chapters, it is worth delving into the close link between IDRL and Human Rights Law (HRL), and Environmental Law.

Natural and man-made disasters inevitably jeopardize the enjoyment of basic human rights such as the right to life, the right to health, the right to food, water, housing and the right to an adequate standard of living among many others, as will be shown in Chapter 3 in the case of nuclear accidents. Therefore, though an explicit reference to disasters in Human Rights Treaties is present only in two instances (in the African Charter on the Rights and Welfare of the Child at Art.23 and in the International Convention on the Rights of Persons with Disabilities at Art.11) the relationship between HRL and IDRL is clear. Particularly important in this context is the recognition by human rights bodies of the presence of three categories of obligations incumbent on States regarding the protection of human rights: the obligation to respect, the obligation to protect and the obligation to fulfill³⁰. According to this tripartition, States have the primary obligation not to violated human

³⁰ IFRC. (2007). *Law and legal issues in international disaster response: a desk study*. Geneva: International Federation of the Red Cross and Red crescent Societies, p.34.

rights with their own acts or omission, but they also have the responsibility to protect those under their jurisdiction from violations stemming from the behavior of relief and humanitarian personnel during humanitarian missions following an adverse event; lastly, the obligation to fulfil “requires States to adopt appropriate legislative, administrative, budgetary, judicial, promotional and other measures to fully realize the [rights]”³¹. This translates into the States having the obligation to take positive measures in order to guarantee the respect of human rights that, in case of disasters, might imply the necessity to consent to humanitarian and relief missions when the circumstances of the case overwhelm States’ capacities³², as required by many IDRL instruments.

Another point that must be stressed is that, if on one hand States are obliged to respect and fulfil human rights and to protect from possible violations, on the other they have the possibility to provide limitations to human rights, meaning “to restrict the exercise of certain [...] rights in the interest of national security or public safety, public order, public health or morals or the protection of the rights and freedoms of others”³³, in order to strike a balance between the universal enjoyment of human rights and more incumbent situations. In this case, the occurrence of a disaster is a situation in which state authorities may legitimately limit the freedom of movement (think for instance to nuclear emergencies during which people are prevented to leave home), freedom of residence that can be limited in case of necessary evacuation of some areas, or the right to property, in order to guarantee public safety, public health and hence forth³⁴. In addition, not only can States limit the exercise of human right, but in case of very severe natural and man-made disasters there are also the prerequisites to limit the enjoyment of, or derogate from human rights treaties (non-derogable rights excluded) and a derogation is “an outright suspension [...] of internationally protected rights”³⁵.

Further details on the link between HRL and IDRL will be provided in the following sections and Chapters; however, just from this brief introduction, it is possible to appreciate the strong interconnectedness between the two branches since the respect of human rights in situations of natural and man-made disasters is strongly dependent on the way in which those situations are managed or even prevented.

³¹ OHCHR - WHO. (2008). *The Right to Health, Fact. Sheet No. 31*. Geneva: United Nations.

³² IFRC. (2007). *Law and legal issues in international disaster response: a desk study*. Geneva: International Federation of the Red Cross and Red crescent Societies, p.34.

³³ Venturini G. (2012). ‘International Disaster Response Law in Relation to Other Branches of International Law’ in de Guttery et al. (eds.). *International Disaster Response Law*. 1st edn. The Hague: T.M.C. Asser Press, p. 49.

³⁴ Sommario E. (2012). ‘Derogation from Human Rights Treaties in Situations of Natural or Man-Made Disasters’ in de Guttery et al. (eds.) *International Disaster Response Law*. 1st edn. The Hague: T.M.C. Asser Press, pp.326-327.

³⁵ *Ibid.*, p.327.

IDRL is also closely linked to International Environmental Law, since all forms of disaster have an adverse impact on the environment, as the definition itself stresses, or, conversely, environmental conditions caused by climate change, have an impact on and exacerbate the likelihood of disasters. For this reason, the majority, if not almost all the treaties dealing with the protection of the environment and climate change are relevant for Disaster Risk Reduction. In brief, treaties concerned with the preservation of nature and ecosystems try to identify those actions and conditions that can cause disasters and aim to prevent them or at least to minimize their impacts. Within this framework, we can cite the Convention on Oil Pollution Preparedness, Response and Cooperation, the Basel convention on the Transboundary Movement of Hazardous Wastes and their Disposal, the MARPOL Convention and all treaties concerning the prevention and management of nuclear emergencies. As well as the application of specific treaties, here a fundamental role is played by the application of the preventive principle and the precautionary principle that “may certainly enhance strategies to reduce the damages caused by natural as well as by man-made disasters”³⁶. In addition, Disaster response is strongly connected to climate change because, on the one hand several international studies and reports, including those of the IPCC³⁷, have demonstrated that climate change is leading to more and more dangerous atmospheric events, thus pointing out the urgency for increasing international cooperation and preparedness. On the other hand, extreme atmospheric events caused by climate change increase the likelihood of industrial and technological disasters. For this reason, it is both necessary to take effective actions to address climate change in order to reduce the incidence of extreme events, and to strengthen international coordination, readiness and capacity to prevent and mitigate the consequences of increasingly possible natural and technological disasters.

Finally, it is significant to explore the commonalities between International Humanitarian Law (IHL) and IDRL. The two are clearly separate since the application *ratione temporis* is distinct: the former applies to situations of armed conflict while the latter to peaceful times; however, they have considerable points in common, starting from the fact that they both aim at relieving the sufferings of the victims of disastrous events. In this sense, the IFRC Desk Study affirms that “it is instructive to look to IHL by way of analogy where it addresses the same issues confronted by IDRL, particularly

³⁶ Venturini G. (2012). ‘International Disaster Response Law in Relation to Other Branches of International Law’ in de Guttery et al. (eds.). *International Disaster Response Law*. 1st edn. The Hague: T.M.C. Asser Press, p.60.

³⁷ E.g. IPCC. (2012). *Managing the Risks of Extreme Weather Events and Disasters to Advance Climate Change Adaptation*. Cambridge: Cambridge University Press.

in light of the fact that some of the origins of IDRL can be traced to the rise of IHL³⁸. Therefore, IDRL borrowed principles and attitudes from IHL as, for instance, the idea that the rules should not be limited to the high emergency phase: the Geneva conventions provide for the application of IHL in situations of conflicts but also in some situations pre- and post-war³⁹; similarly, IDRL developed to embrace both prevention and reconstruction after disastrous events. Other principles that IDRL derived from IHL concern the delivery of humanitarian assistance and the requirement of consent, the responsibilities, protection and status of humanitarian personnel, the sharing of information and coordination systems. What can be said is that IHL has a much longer history of codification, scholarly debate and practice; for this reason, IDRL should continue to draw from IHL tenets in order to build a more comprehensive and consistent framework⁴⁰.

One last remark about the content of IDRL and specifically of binding legal instruments relates to the fact that it is much concerned about the coordination, discipline and configuration of rather technical and organizational matters, such as the sharing of information and data, command of relief activities, facilitation of the movement of personnel and goods across State borders, provision of visas, requirements for humanitarian assistance and so forth. The problem lies in the fact that such structure does not take enough into account the voices and rights of disaster victims that are relegated to a secondary role: they are the object and not the subject of regulations, as it should be since they are very negatively affected by disasters not only directly but also as a consequence of environmental destruction and property loss⁴¹. This is the gap that the ILC tried to fill by adopting a right-based approach to the Draft Articles on the Protection of People in the Event of Disaster and, as a second step, by urging to UNGA to take into serious consideration the possibility of concluding a universal treaty based on the Draft Articles, as the next section describes.

2. The Draft Articles on the Protection of Persons in the Event of Disasters: a possible starting point for a universal treaty solving the piecemeal character of IDRL

³⁸ Venturini G. (2012). 'International Disaster Response Law in Relation to Other Branches of International Law' in de Guttery et al. (eds.). *International Disaster Response Law*. 1st edn. The Hague: T.M.C. Asser Press, p.51.

³⁹ Hoffman M. H. (2003) 'What is the scope of International Disaster Response Law?' in IFRC. *International disaster response laws, principles, and practice: reflections, prospects and challenges*. Geneva: International Federation of the Red Cross and Red Crescent Societies, p.15.

⁴⁰ Venturini G. (2012). 'International Disaster Response Law in Relation to Other Branches of International Law' in de Guttery et al. (eds.). *International Disaster Response Law*. 1st edn. The Hague: T.M.C. Asser Press, p.52.

⁴¹ Aronsson-Storrier M., da Costa K. (2017). 'Regulating Disasters? The role of international law in disaster prevention and management', *Disaster Prevention and Management*, Vol.26, No.5, p.2.

In 2016, the International Law Commission, an expert body of the UN entrusted with “the promotion of the progressive development of international law and its codification”⁴², completed its work on the Draft Articles on the Protection of Persons in the event of Disasters. The general purpose of ILC with the finalization of the Draft Articles was that of providing a concrete starting point for the consideration of the realization of a universal treaty on IDRL that could, at least in part, solve the problem of the lack of a consistency and comprehensiveness of legal framework in the field, and more specifically, to provide a framework “to facilitate the adequate and effective response to disasters, and reduction of the risk of disasters, so as to meet the essential needs of the persons concerned, with full respect for their rights”⁴³.

The ILC started to deal with the topic “protection of people in the event of disasters” concretely in 2007 when, “at its fifty-ninth session in 2007, the Commission decided to include the topic in its current programme of work and appointed Mr. Eduardo Valencia-Ospina as Special Rapporteur”⁴⁴. The following year, the Special Rapporteur issued a Preliminary Report with the aim of exploring the scope of the topic in terms of its application *ratione materiae, ratione personae and ratione temporis* specifying that “the work to be undertaken would not entail an exhaustive analysis of the legal ramifications of disasters but only those that pertain to the protection of persons”⁴⁵; therefore, he generally defined the subject matter of the work. In this regard, Valencia-Ospina, always in the Preliminary Report, clearly stated that the topic fell principally in the domain of progressive development but at the same time the likelihood of establishing the presence of customary rules should not be excluded *a priori*.

This said, attention will now be turned to the relevant specific issues that the Special Rapporteur approached in its preliminary and subsequent Reports and how they were included or rendered in the final document.

2.1. Main issues addressed in the Preliminary Report by the Special Rapporteur Eduardo Valencia Ospina and subsequent discussions.

⁴² ILC (1947). Statute of the International Law Commission.

⁴³ ILC Draft Articles on the protection of Persons in the Event of Disasters, Article 2.

⁴⁴ Valencia-Ospina E. (2008). Preliminary Report on the Protection of People in the Event of Disasters, UN Doc. A/CN.4/598,, p.145, para 2.

⁴⁵ *Ibid.*, p.146, para 11.

In the Preliminary Report, Mr. Valencia-Ospina started to consider the concept of disaster and its definition. As stated in the previous section, he affirmed that a universally-accepted legal definition of the notion of disaster was currently lacking because of the aforementioned difficulties. A first important thing to stress is that Valencia-Ospina, differently from the attitude expressed by the Secretariat, opted for a broad approach that included all types of disasters, with the exception of armed conflict that are regulated by the rules pertaining to IHL, starting from the acknowledgement that “the need for protection can be said to be equally strong in all disaster situations”⁴⁶. Moreover, another fundamental remark, included in the same document, concerns the international character of disasters: the internationality of some disastrous events does not have to be interpreted as a requirement of the presence of transboundary effects or multiple affected states, but instead the internationality of a disastrous event has to be interpreted in terms of attention and provision of assistance coming from the international community in case the affected state is unable to address the situation properly.

From the Special rapporteur considerations and the debate that followed within the ILC, the definition of disaster present in the Draft Articles is the following: “‘disaster’ means a calamitous event or series of events resulting in widespread loss of life, great human suffering and distress, mass displacement, or large-scale material or environmental damage, thereby seriously disrupting the functioning of society”⁴⁷. Also from the wording of this definition, that particularly emphasizes the effects of disasters in terms of tragic physical and mental consequences, it is clear how the protection of persons is really at the core of the project. Indeed, dealing with the application *ratione materiae*, Valencia-Ospina reiterated that “for the purposes of the present topic, protection has been qualified as the protection of persons”⁴⁸. Regarding the protection of people, it should be recalled that States are obliged to protect all people under their jurisdiction in all circumstances including of course situations of disasters, respect human rights and fulfil human rights, obligations that are contained in the majority of human rights treaties, as well as being customary law. Now, observing that the close link and relationship between IDRL and HRL, though really strong and evident, had not clearly and explicitly been formalized, or better crystallized in any international binding instrument and that in time of emergency the protection, respect and fulfillment some human rights acquire particular relevance, the Special Rapporteur deemed the consideration of

⁴⁶ Ibid., p.152, para 49.

⁴⁷ ILC Draft Articles on the protection of Persons in the Event of Disasters, Article 3(a).

⁴⁸ Valencia-Ospina E. (2008). *Preliminary Report on the Protection of People in the Event of Disasters*, UN Doc. A/CN.4/598, p.153, para 52.

adopting a right-based approach to the protection of persons in the event of disasters that also reflected the tripartition of states' human rights obligations (protect, respect, fulfil)⁴⁹ as extremely relevant and important.

This proposal of the Special Rapporteur was then discussed by the members of the ILC. In the Report of the ILC dated 5 May-6 June and 7 July-8 August 2008, the members welcomed with no particular opposition the adoption of right-based approach; however, some of them pointed out the need to clarify the meaning of such approach and others expressed a substantial uncertainty about its application to the Draft Articles⁵⁰. The Special Rapporteur considered further the matter in his second report in which he traced back the history of the emergence of the right-based approach. Indeed, he stated that "rights-based approaches emerged during the late 1980s as a conceptual change from previous paradigms of development studies. The shift of language implied that development policy could and should be seen as a matter of rights"⁵¹. This advancement is of fundamental importance in the field of IDRL because humanitarian assistance has always been primarily focused on the delivery of food, clothes, medicines and other commodities with the aim of satisfying the needs of people affected by natural or man-made emergencies; so, attention was fundamentally directed toward the satisfaction of people's needs rather than to the respect of human rights. This is fundamental because the satisfaction of needs and the respect of human rights are linked but not the same; as UNFPA affirms, "it's an important distinction, because an unfulfilled need leads to dissatisfaction, while a right that is not respected leads to a violation"⁵². Nevertheless, it must be stressed that needs and human rights are not in position because sometimes the non-satisfaction of needs can amount to a violation of human rights like the right to food, the right to shelter and the right to health among the others. This link between needs and human rights was acknowledged also by the Special Rapporteur that in his second report claimed that "there is no stark opposition between needs and a rights-based approach to the protection of persons in the event of disasters. On the contrary, a reasonable, holistic approach to the topic seems to require that both rights and needs enter the equation, complementing each other when appropriate"⁵³.

⁴⁹ Ibid., p. 149, para 26.

⁵⁰ ILC (2008). Report of the International Law Commission, sixtieth session (5 May-6 June and 7 July-8 August 2008), Supplement No.10 (A/63/10), p.316, paras 227-229.

⁵¹ Valencia-Ospina E. (2009). Second report on the protection of persons in the event of disasters, UN doc. A/CN.4/615.

⁵² United Nations Population Fund (2014). *The Human Rights-based Approach*. Available at: <https://www.unfpa.org/human-rights-based-approach>, (accessed: 11 November 2020).

⁵³ Valencia-Ospina E. (2009). Second report on the protection of persons in the event of disasters, UN doc. A/CN.4/615, p.191, para 17.

This point of view was reiterated in the Report of the International Law Commission. Indeed, the Report of the International Law Commission, Sixty-first session (4 May-5 June and 6 July-7 August 2009), states that

he [Valencia-Ospina] recalled that such approach had to be understood in two senses: requiring particular attention be paid to the needs and concerns of individuals who are suffering; and as a reminder that people have legal rights when disaster strikes, thereby reaffirming the place of international law in the context of disasters. [...] a rights-based approach did not mean that any human rights violations justify forcible humanitarian intervention. The rights-based approach merely created a space to assess the prevailing legal situation, in light of both the State's rights as a sovereign subject of international law, and of its duty to ensure the rights of individuals in its territory⁵⁴

From this remark, three important consequences can be derived: first the adoption of the right-based approach creates a distinction between duty holders, namely people hit by emergencies that have the legal right to claim the respect, protection and fulfillment of their human rights, and duty bearers, namely States; second, the work of the ILC on the Protection of Persons in the Event of Disasters adopted a rights-based approach but it was moderated by the attention paid to needs and especially to State Sovereignty, an attitude that is fully spelt out in the Preamble and in Art.2 that specifies the purpose of the Draft Articles; third, in connection to the previous point, there is the need to strike a balance between the protection of human rights and the respect of state sovereignty that is another key aspect that was deeply taken into account in the formulation of the Draft articles. These considerations are then reflected both in the provisions pertaining to the "vertical axis" (relationship between people hit by the disaster on the one hand, and affected state and actors providing assistance on the other) and the "horizontal axis" (relationship between affected state and actors providing assistance) in which the Draft articles are articulated⁵⁵.

2.2. The "vertical" dimension.

⁵⁴ ILC (2000). Report of the International Law Commission, Sixty-first session (4 May-5 June and 6 July-7 August 2009), Supplement No. 10 (A/64/10), p.335, para 178.

⁵⁵ Bartolini G. (2017). 'A universal treaty for disasters? Remarks on the International Law Commission's Draft Articles on the Protection of Persons in the Event of Disasters', in *International Review of the Red Cross*, Vol.99, No.3, p. 1111.

The “vertical” aspect of the Draft Articles, which stresses more directly the concerns for the consideration of human rights in the event of disasters, is reflected in Art. 4 (“Human dignity” that has to be viewed as a “guiding principle for any action to be taken in the context of the provision of relief assistance, in disaster risk reduction and in the ongoing evolution of applicable laws”⁵⁶, in accordance with the main international human rights treaties and several IDRL soft law instruments), Art.5 (“Human rights”) and art.6 (“humanitarian principles”).

Particular attention should be paid to Art. 5 which affirms that “persons affected by disasters are entitled to the respect for and protection of their human rights in accordance with international law”⁵⁷, so that it implicitly re-states the obligation of States, but also of assisting actors, to observe their human rights obligations during the different disaster phases. What is particularly important in this article is the wording “in accordance with international law”. As the commentary to this article reminds, international law provides for the possibility of limiting the enjoyment of certain human rights in particular and specific situations, and even to derogate from human rights treaties, therefore persons affected by disasters are entitled to the respect for and protection of their human rights to the extent provided by international law in the event of disasters.

As far as Art.6 is concerned, it deals with the principles of humanity, neutrality, impartiality, and non-discrimination that must be applied when assisting people affected by disastrous events. It is meaningful because these principles have been included in legally binding texts dealing with IDRL only occasionally⁵⁸. Moreover, since “the needs of the particularly vulnerable”⁵⁹ must be taken into special consideration, the commentary to this article emphasizes the non-strict application of the principle of non-discrimination, but the need to consider a “positive discrimination”, meaning that particular attention has to be directed to the necessities of vulnerable groups⁶⁰.

2.3. The “horizontal” dimension.

⁵⁶ ILC (2016). Report of the International Law Commission, sixty-eight session (2 May-10 June and 4 July-12 August 2016, Supplement No.10 (A/71/10), p.28, para 1.

⁵⁷ ILC Draft Articles on the Protection of Persons in the Event of Disasters, Article 5.

⁵⁸ Bartolini G. (2017). ‘A universal treaty for disasters? Remarks on the International Law Commission’s Draft Articles on the Protection of Persons in the Event of Disasters’, in *International Review of the Red Cross*, Vol.99, No.3, p.1117.

⁵⁹ ILC Draft Articles on the Protection of Persons in the Event of Disasters, Article 6.

⁶⁰ ILC Draft Articles on the Protection of Persons in the Event of Disasters with commentaries, Art. 6, para 7. The Commission decided not to include a list of vulnerable groups but the UNGA in resolution 69/135 of December 2014 urged those involved in the different disaster phases and emergency activities to “take into account the specific humanitarian needs and vulnerabilities of all components of the affected population, in particular girls, boys, women, older persons and persons with disabilities”.

Articles from Number 7 to 17 deal with the so-called “horizontal dimension” and delve into the relationship between and the responsibilities of assisting actors and the States affected by the disaster, always in light of a right-based approach. The main difficulty lay in striking a balance between the principle of state sovereignty and non-intervention, and the need, in some cases, to provide timely humanitarian assistance. The need to find a compromise was introduced by the Special Rapporteur in his third report in which he analyzed the issue in depth. In the document issued in 2010, it is possible to read that

the territorial State (i.e. the affected State), and not a third State or organization, has the primary responsibility to protect disaster victims on its territory. [...] From the firmly established principles of international law [regarding the principles of sovereignty and non-intervention], it is clear that a State affected by a disaster has the freedom to adopt whatever measures it sees fit to ensure the protection of the persons found within its territory. In addition, as a consequence, no other State may legally intervene in the process of response to a disaster in a unilateral manner: third parties must instead seek to cooperate. [...] This sovereign authority remains central to the concept of statehood, but it is by no means absolute. When it comes to the life, health and bodily integrity of the individual person, areas of law such as international minimum standards, humanitarian law and human rights law demonstrate that principles such as sovereignty and non-intervention constitute a starting point for the analysis, not a conclusion⁶¹.

The acknowledgment of the importance of the principle of sovereignty and non-intervention is a starting point because, as pointed out in the groundbreaking “Declaration on Principles of International Law Friendly Relations and Co-operation among States in Accordance with the Charter of the United Nations”, the idea of sovereignty and sovereign equality brings along a series of duties States have to respect exactly because they are sovereign entities, and in particular “every State has the duty to fulfil in good faith its obligations under the generally recognized principles and rules of international law”⁶². As a consequence, the ILC has primarily identified the duties that affected States possess.

⁶¹ Valencia-Ospina E., (2010). Third report on the protection of persons in the event of disasters, UN doc. A/CN.4/629, pp. 23-24, paras 63, 74, 75.

⁶² UNGA (1970). Declaration on Principles of International Law Friendly Relations and Co-operation among States in Accordance with the Charter of the United Nations, A/RES/25/2625..

The first and foremost duty identified by the Special Rapporteur in his third report on the issue consists in ensuring “the protection of persons and provision of disaster relief assistance in its territory, or in territory under its jurisdiction or control” (Art.10 (1)). The duty to provide assistance was supported by reference to IHL and specifically to Additional Protocol II to the Geneva Conventions but also to the pronouncements of the European Court of Human Rights which repeatedly stated that national authorities are in the best position to assess the severity of the situation and to respond quickly⁶³; in addition, similar provisions that urge States to act aptly in cases of emergencies are contained in the International Covenant on Economic Social and Cultural Rights, and the Convention on the Rights of Persons with Disabilities which, as already noted, makes explicit reference to disaster situations. The fact of acknowledging that the primary responsibility of affected States is to secure the protection of persons under its jurisdiction and to provide assistance, a responsibility directly emerging from the recognition of the principles of sovereignty and non-intervention, implies a series of consequences: first, “[it] has the primary role in the direction, control, coordination and supervision of such relief assistance” (Art.10 (2)); second, the provision of relief assistance provided by international actors is subject to consent (Art.13 (1)), always in respect of state sovereignty and right of non-intervention⁶⁴. The requirement of consent is a pillar of IL and, as such, it is reiterated in many international instruments, both in the field of IDRL, like in the Tampere Convention or, implicitly, in the Assistance Convention in Case of a Nuclear Accident or Radiological Emergency, and in other instruments pertaining to other branches of IL, like in Additional protocol I to the Geneva Conventions.

The investigation of the duties of affected States in time of emergency continued in the fourth report submitted by the Special rapporteur in 2011. Of course, the requirement of consent identified in the previous report implies that some kind of international assistance is provided. In this sense, he elaborated the “duty of the affected State to seek external assistance” (Art.11) when “a disaster manifestly exceeds [...] national response capacity”⁶⁵, a duty that can be considered as a direct consequence of the identification of the duty to protect persons and provide assistance and relief. This double obligation incumbent on affected States, namely to provide assistance but also to seek help when the circumstances overwhelm national capacities, is a clear manifestation of the need to strike a balance between the State’s interests in terms of sovereignty and non-intervention,

⁶³ Valencia-Ospina E. (2010). Third report on the protection of persons in the event of disasters, UN doc. A/CN.4/629, p. 26, para 76.

⁶⁴ Ibid. p.27, para 78.

⁶⁵ ILC Draft Articles on the Protection of Persons in the Event of Disasters, Article 11.

and those of the international community that have an interest in ensuring the protection, respect and fulfilment of human rights, in line with the prerogatives of the obligations *erga omnes*. One thing to underline is that, always referring to draft article 11, the final title uses the wording “seek assistance”. This choice was pondered and not casual: considering the presence of the requirement of consent, the Special Rapporteur deemed it more pertinent than the expression “request assistance”. Indeed, he claimed that the term “request” indicates that if a possible assisting State accepts the request, the consent is automatically taken for granted⁶⁶; as a consequence, as the Secretariat memorandum affirms (quoted by Valencia-Ospina in the fourth report) “a duty to request assistance may constrain a State’s ‘ability to decline offers of assistance’”⁶⁷. On the other hand, the term “seek” gives the idea of a sort of negotiating process for the provision of international humanitarian relief and assistance⁶⁸.

So, the affected State has a duty to seek assistance, but at the same time, international actors, especially States and the United Nations but not exclusively them, are pushed to take action and offer assistance (Art.12 (1)) because

non-affected States, as members of the international community, have an interest in the protection of persons in the event of disasters not occurring within their territory. This interest needs to be understood in the context of the primary responsibility of the affected State in the protection of persons in its territory, as it also is an expression of the principle humanity⁶⁹.

Therefore, even though affected States have the primary role to respond adequately in case of disasters, the offer of assistance by international actors is a show of solidarity and cooperation which is a fundamental underlying principle of the management of complex situations like disasters, as will be explained in the following lines; moreover, as stressed by the Special Rapporteur in his third report and in accordance with several international instruments, an offer of assistance does not have to be considered as a violation of the sovereignty of the affected states, nor does it consist in an intrusion in the State’s domestic affairs⁷⁰. In addition, a relevant remark concerning the discussion on the offer of assistance

⁶⁶ Valencia-Ospina E. (2011). Fourth report on the protection of persons in the event of disasters, UN doc. A/CN.4/643, p.14, para 44.

⁶⁷ *Ibid.*, p. 14, para 44.

⁶⁸ *Ibid.*

⁶⁹ *Ibid.*, p.24, para 81.

⁷⁰ *Ibid.*, p.32, para 107.

relates to the fact that, initially, Art.12 referred to the “right” to offer assistance. However, some members of the ILC noted that it was difficult to speak of a general “right” to offer assistance because, since offers can come from different actors, this would mean that all actors possess the same rights States enjoy⁷¹. Indeed, when it comes to disaster response, many different actors can offer their aid (as it is acknowledged in the commentary to art.12 itself, in which it is claimed that “the context of offers of external assistance, [...] all potential assisting actors [can] make an offer of assistance, regardless of their status and the legal grounds on which they can base their action”⁷²), from States, to IGOs, NGOs, and even private actors: if we consider for instance nuclear or chemical disasters, sophisticated and state-of-the-art instruments can be supplied by private research institutes and companies. It is clear that all these actors have different positions in the international system, and some of them are not even subjects of IL; as a consequence, they have different rights, if any, interests and responsibilities; for this reason, the ILC, following the concerns of some members, refrained from making reference to the presence of a general right to offer assistance.

Before turning to the analysis of the relevance of the principle of cooperation, it is necessary to conclude the discussion on the issue of consent by examining the duty of the affected States not to arbitrarily withhold consent. If, on the one hand, the requirement of consent by the affected State is fundamental for the provision of any form of international assistance and relief operation as a legitimate expression of its sovereign will, on the other hand, the need to ensure an appropriate balance between the necessities and interests of all stakeholders in disaster situations led to the establishment of a duty not to arbitrarily withhold the consent on the part of the affected state (Art.13 (2)). This duty arises from the recognition that it happened that the situation of the affected population got dramatically worse because of the failure on the part of the affected State to admit the severity of the situation and to give consent for international assistance and relief operations⁷³; as a consequence, this duty is particularly meaningful in case of inability or unwillingness to face properly the consequences of a disastrous event. Furthermore, the duty not to arbitrarily withhold consent is consistent with the idea that the State has the responsibility to protect those persons under its

⁷¹ Zorzi Giustiniani F. (2012), ‘The Works of the International Law Commission on Protection of Persons in the Event of Disasters. A Critical Appraisal’ in de Guttery et al. (eds.) *International Disaster Response Law*. 1st edn. The Hague: T.M.C. Asser Press, p. 82.

⁷² Draft Articles on the protection of persons in the event of disasters with commentaries (2016), Art.12, para.6.

⁷³ Valencia-Ospina E. (2011). Fourth report on the protection of persons in the event of disasters, UN doc. A/CN.4/643, p.16, para 53.

jurisdiction and the fact that “[...] the sovereignty of the State should be exercised in the way that best contributes to the protection and assistance of those in need”⁷⁴. Both for the determination of the presence of inability or unwillingness to take action properly and arbitrariness of the withhold of consent, Mr. Valencia-Ospina made reference to some examples⁷⁵, but he admitted that the circumstances must be analyzed case-by-case. However, the ILC suggested that, in general, the failure to motivate the refusal of an offer of assistance might be considered as the presence of lack of good faith⁷⁶. Again, considering Art.13 as a whole, it is possible to appreciate how it aims at balancing the need to affirm the importance of the expression of the sovereignty of the state by means of the expression of consent to assistance, and, at the same time, the need to put some constraints to its unfettered exercise in order to ensure the respect of human rights and the interests of the international community to guarantee their respect, protection and fulfillment.

Until now the main focus was on the duties of the affected States. Nevertheless, as affirmed by Art.7 “ [all] States, shall, as appropriate, cooperate among themselves, with the United Nations, with the components of the Red Cross and Red Crescent Movement, and with other assisting actors”⁷⁷, so there is a duty to cooperate incumbent on all relevant international actors. This duty to cooperate is implicit in two key provision that have already been analyzed, such as the duty to seek assistance and the offer of external assistance. Of course, cooperation is always subject to the respect of State sovereignty and non-intervention. This effort to balance cooperation and assistance with the prerogatives of sovereignty is not new in International Law because both in the UN charter, the abovementioned landmark “Declaration on Principles of International Law Friendly Relations and Co-operation among States in Accordance with the Charter of the United Nations”, and UNGA Resolutions the primary importance of the respect of the principles of sovereignty and non-intervention is weighed against the fundamental requirement of cooperation that in IDRL is literally vital⁷⁸.

Following with the review of the duties contained in the Draft Articles to which all States are subjected, Art.9 refers to prevention and, in particular, to the fact that “each State [emphasis

⁷⁴ Ibid., p.17, para 56.

⁷⁵ See *ibid.*, p. 21-22, paras 71-73.

⁷⁶ Bartolini G. (2017). ‘A universal treaty for disasters? Remarks on the International Law Commission’s Draft Articles on the Protection of Persons in the Event of Disasters’, in *International Review of the Red Cross*, Vol.99, No.3, p.1126.

⁷⁷ ILC Draft Articles on the Protection of Persons in the Event of Disasters, Article 7.

⁷⁸ Valencia-Ospina E. (2012). Fifth report on the protection of persons in the event of disasters, UN doc. A/CN.4/652, p.22., para 84.

added] shall reduce the risk of disasters by taking appropriate measures, including through legislation and regulations, to prevent, mitigate, and prepare for disasters”⁷⁹.

The decision to include prevention in the text of the Draft Articles was a long and debated one. The Special Rapporteur considered the issue concerning which phases of the disasters cycle should be tackled by the Draft articles in his Preliminary Report when he explored the possible application *ratione temporis* of the work. In his reasoning, he departed from the idea that the basic goal of the Draft Articles is the protection of persons and the notion of protection comprises the provision of adequate response, relief and assistance. As a consequence, since relief and especially assistance⁸⁰ are not limited to the high phase of the emergency but they are relevant also for pre-disaster and post-disaster activities, “a broad approach appears indicated as concerns the phases which should be included”⁸¹. Moreover, the same high consideration for the inclusion of the prevention phase in the work of the ILC had already been expressed by the UN Secretariat in 2006, recalling the prominence it was given in the Hyogo Framework for Action 2005-2015. Despite this, during the consultations in the Sixth Committee, while some members welcomed the considerations put forward by Mr. Valencia-Ospina, some others were skeptical. For this reason, the Special Rapporteur, in his Second report, made the decision to limit the application *ratione temporis* of the Draft Articles to the emergency and post-disaster phases; however, he stated that “this is without prejudice to the Commission addressing, at a later stage, preparedness at the pre-disaster phase”⁸², approach confirmed by the adoption of a broad definition of the scope of the Draft Articles⁸³. The Special Rapporteur reapproached the issue of prevention and Disaster Risk Reduction in the Fifth Report in the context of cooperation, and more in depth in the following one. As remarked by Pronto et al., by the time Mr. Valencia-Ospina delivered his Sixth Report, the debate among the members had shifted from the appropriateness to include the issue of

⁷⁹ ILC Draft Articles on the Protection of Persons in the Event of Disasters, Article 9.

⁸⁰ Assistance is defined as the “distribution of the goods, materials and services essential to the survival of the population”, therefore it is clear how this definition is not limited to the emergency phases, but it also refers to the provision of what is needed to increase populations’ resilience, preparedness and response capacities. See Valencia-Ospina E. (2008). Preliminary Report on the Protection of People in the Event of Disasters, UN Doc. A/CN.4/598, p.153, para 51.

⁸¹ Valencia-Ospina E. (2008). Preliminary Report on the Protection of People in the Event of Disasters, UN Doc. A/CN.4/598, p.152, para 57.

⁸² Valencia-Ospina, (2009). Second report on the protection of persons in the event of disasters, UN doc. A/CN.4/615, p.193, para 29.

⁸³ Pronto A. et al. (2019). ‘The ILC Draft Articles on the Protection of Persons in the Event of Disasters and Disaster Risk Reduction: a Legislative History’, in Samuel L. H. K. et al. (eds.) *The Cambridge Handbook of Disaster Risk Reduction and International Law*. Cambridge: Cambridge University Press, p.76.

prevention in the Draft Articles, to the manner in which it had to be tackled and in what terms⁸⁴. This change occurred because of the increasing attention that was devoted to the importance of Disaster Risk Reduction and prevention both at the international level, as testified, for instance, by the aforementioned UNGA Resolution 65/157 of 2010, and at the domestic level with new policies and rules, adopted in line with the recommendations contained in the IDRL Guidelines and Model Act of the IFRC.

Following the concerns of some members after the conclusion of the first reading, the text of the Draft Articles was in part modified also with the purpose of better integrating the concept of prevention throughout the document. To make a long story short, the outcome of discussions and debates led to the drawing-up of Art.9 on “reduction of the risk of disasters” which reads as follows: “(1) Each State shall reduce the risk of disasters by taking appropriate measures, including through legislation and regulations, to prevent, mitigate, and prepare for disasters. (2) Disaster risk reduction measures include the conduct of risk assessments, the collection and dissemination of risk and past loss information, and the installation and operation of early warning systems”⁸⁵. Three important things have to be pointed out: first, the article refers to an obligation (*shall*) that stems, *inter alia*, from the States’ positive obligations under Human Rights Law and International Environmental law which provides for the respect of the *sic utere tuo ut alienum non laedas*, due diligence and precautionary principle⁸⁶; second, each State must respect it also because the ILC was of the idea that the obligation to reduce the risk of disaster belong to customary international law⁸⁷, according to a consolidated practice of States in engaging in disaster prevention and the great importance they attach to it, as reflected in the adoption of many (especially non-binding but authoritative) international instruments. In addition, Art.9 has to be considered in light of the duty to cooperate spelt out in Art.7. As a consequence, despite Art. 9(2) refers primarily to domestic measures to be implemented, cooperation is fundamental, especially for the exchange of information, good practices and expertise that can improve States’ preparedness and reduce the impact of disasters on populations.

⁸⁴ Ibid.

⁸⁵ ILC Draft Articles on the Protection of Persons in the Event of Disasters, Article 9.

⁸⁶ Valencia-Ospina E. (2013)). Sixth report on the protection of persons in the event of disasters, UN doc. A/CN.4/662, pp.14-25.

⁸⁷ Pronto A. et al. (2019). ‘The ILC Draft Articles on the Protection of Persons in the Event of Disasters and Disaster Risk Reduction: a Legislative History’, in Samuel L. H. K. et al. (eds.) *The Cambridge Handbook of Disaster Risk Reduction and International Law*. Cambridge: Cambridge University Press, p.81.

2.4. Practical dispositions and final remarks.

To conclude this brief overview of the work of the ILC, Articles from 15 to 17 deal with practical measures for the “facilitation of external assistance” (Art.15), “protection of relief personnel, equipment and goods” (Art.16), and “termination of external assistance” (Art.17). Concerning Art.17, it provides that, with regard to the termination of assistance, there must be consultations, timely notification, and, consequently, appropriate coordination among the parties involved in providing assistance to the affected population. This requirement was spelt out with a view to guarantee the respect of people’s rights and needs, since “premature and uncoordinated disengagement might be detrimental to victims”⁸⁸.

The ILC adopted the Draft Articles on the Protection of Persons in the Event of Disasters, at its 68th session in 2016, on second reading, and recommended the General Assembly to elaborate a convention on its basis⁸⁹. The same year, the General Assembly, with resolution 71/141, considered the Draft Articles and urged States to provide comments on the proposal of developing a convention, put forward by the ILC, and, in 2018, after having received observations by States that expressed diverging views, “decided to include in the provisional agenda of its seventy-fifth session (2020) an item entitled ‘Protection of persons in the event of disasters’”⁹⁰. The work of the ILC was discussed within the Sixth Committee in its November 2020 meetings. Delegations’ points of view regarding the elaboration of a convention based on the Draft Articles resulted diverging, with some delegations that expressed overall support and others that considered the elaboration of a binding treaty as still premature and showed preference for the issue of the protection of persons in the event of disasters to be regulated through guidelines. If this latter line of thought will prevail and the Draft Articles will not give rise to a binding convention, it can be said that the work of the ILC is anyway considerably relevant because, as some delegations pointed out “the draft articles reflected existing State practice and principles of international law and that they constituted progressive development of international law. It was also stated that some draft articles codified

⁸⁸ Bartolini G. (2017). ‘A universal treaty for disasters? Remarks on the International Law Commission’s Draft Articles on the Protection of Persons in the Event of Disasters’, in *International Review of the Red Cross*, Vol.99, No.3, p. 1130.

⁸⁹ ILC (n.d.). *Analytical Guide to the Work of the International Law Commission – Protection of persons in the event of disasters*. Available at: https://legal.un.org/ilc/guide/6_3.shtml (accessed: 2 December 2020).

⁹⁰ Ibid.

international law”⁹¹, so they can contribute to the emergence of customary principles in the field of IDRL. Because of these persisting divergencies among delegations and uncertainties, the issue will be reconsidered in 2021 at the seventy-sixth session.

All in all, the work of the ILC constitutes an important step forward in the development of IDRL; therefore, its analysis is instrumental in order to better understand the boundaries and main issues surrounding this branch of International Law. It contributes to give more consistency and homogeneity to a field that has always been considered fragmented, incoherent and nebulous. However, a weakness that should be underlined is that, as they are, these Draft Articles may, at best, give rise to a general Framework Convention; accordingly, it is clear that this work cannot solve the challenges posed by disaster response alone. At the same time, the very relevant advancement, consisting in adoption of a right-based approach that put people at the core of the analysis, cannot be underestimated. The focus on people’s rights and needs permitted to strike a balance between all stakeholders interests, drawing primary attention on the necessity to cooperate. In this sense, though the Draft Articles departed from a strictly traditional conception of state sovereignty and took in high consideration its significance, they provided for a series of limitation to its exercise for the good of the affected populations.

3. From theory to practice: obstacles and difficulties that jeopardize an efficient and prompt management of emergency situations.

As it has already been described, the body of rules pertaining to the field of IDRL is characterized by fragmentation, gaps, insistences and gray areas that the work of the ILC only partially solved. This state of affairs can give rise to two main undesirable situations that play against the attainment of the basic purpose of IDRL, namely the minimization of the detrimental effects of disasters on the affected population, as well as the environment. First, not-so-well defined duties, arising from a patchwork of different instruments, generates lack of clarity and the impossibility to outline precise responsibilities, as in the case of the possible duty to request and accept assistance and related issues; Second, always because of fragmentation and absence of well-established, coherent and binding international regulations, regulatory and legal problems at the domestic level can arise in

⁹¹ UN (2020). *Protection of persons in the event of disasters (agenda item 89)*. Available at: <https://www.un.org/en/ga/sixth/75/disasters.shtml> (accessed: 3 December 2020).

the form of a lack of preparedness, adequate coordination and organization plans and schemes for the efficient management of disaster effects, especially regarding the entry, status and control of relief personnel. Of course, what is alarming is that all these problems come to the surface when what is written in the myriad of instruments pertaining to the field of IDRL has to be translated into practice when disasters strike, moments in which resoluteness, clarity, coordination and promptness should reign, not uncertainty, indecision and confusion⁹².

3.1. Request and acceptance of international assistance: the duties incumbent on the affected States.

The first and foremost problem is related to the duties incumbent on affected states, but possibly also on international actors, regarding the provision of humanitarian assistance. Clarity about this aspect is fundamental in order to avoid delays in the undertaking of international relief programs. The main questions to be answered are the following: is an affected States obliged to seek and request assistance? Is it obliged to accept assistance? To what extent is it entitled to refuse international offers of humanitarian help? Giving an answer to these question is not an easy task because the field of disaster response has been characterized by distinct and sometimes even contrasting and diverging state practice; for this reason, codification of customary laws is rather difficult, so that any attempt to identify clear rules lies in the realm of progressive development⁹³. These issues have been tackled with due attention by the ILC, as it was described in section (1.2.). However, because of their primary importance for a prompt and affective management of critical situations, they deserve to be analyzed more in details, also taking into account other aspects that are not treated in the ILC Draft Articles or that are not properly developed.

Before starting with the analysis of the international debate about humanitarian assistance in the aftermath of a man-made or natural disaster and the already well-established duties affected States have, it is important to provide a definition of what is meant by humanitarian assistance. In order to do so, it is useful to compare it to humanitarian intervention. The two have many points in common, including the final goal (the alleviation of people's sufferings, the fulfillments of people's

⁹² Fisher D. (2007) 'The Law of International Disaster Response: overview and ramifications for military actors' in Carsten M. D. (ed.) *Global legal challenges: command of the commons, strategic communication, and natural disasters*. Newport, RI: Naval War College, pp. 302.

⁹³ Heath J. B. (2011). 'Disasters, Relief, and Neglect: the Duty to Accept Humanitarian assistance and the Work of the International Law Commission', in *the New York University Journal of International Law and Politics*, Vol.43, No.2, p.424.

needs and human rights), but at the same time they have to be kept separated. This said, humanitarian intervention is characterized by three main elements that can be applied to the notion of humanitarian assistance as well. The first element is the requirement of a humanitarian emergency; second, it involves international actors; third, the actions and operations of the international actors must solely have humanitarian intentions aimed at coping with the disastrous effects of disasters on the population⁹⁴. At the same time, it is essential to differentiate them because they take place in different situations: humanitarian intervention refers to situation of conflicts, so it is subjected to the rules of IHL, while it is humanitarian assistance that is applicable to situations of natural or man-made disasters and in this case it is regulated by IDRL; from this clear separation, it is possible to identify two other fundamental distinction: because of the hostile environment in which they take place, international humanitarian interventions require the support of military forces also because these operations are not strictly limited to the supply of commodities; second, humanitarian interventions can take place without the consent of the State in which they are carried out following a resolution of the UN Security Council, in accordance with Chapter VII of the UN Charter⁹⁵; the same possibility, is currently excluded, as it will be shown in the following pages, in the case of humanitarian assistance after natural and man-made disasters in which the consent of the affected States seems to be indispensable.

As it has previously been noted, when disasters strike, affected States have the primary responsibility and duty to respond and assist their population in accordance with their obligations to respect, protect and fulfil human rights. Unfortunately, sometimes disasters are so catastrophic that they overwhelm the national capacities to deal with them affectively. In this case, several soft-law instruments like the ILC Draft Articles, the *Institut de Droit International* Bruges Resolution of 2003 and the IFRC Guidelines, have identified the existence of a duty to seek international assistance that, again, flows from the affected State's "duty to ensure the protection of persons and provision of disaster relief assistance in its territory, or in territory under its jurisdiction or control"⁹⁶, as well as from the duty to cooperate. Most importantly, both the ILC and the *Institut de Droit International* share the idea that the duty to seek assistance is customary law. It must be recalled that, following the explanation provided by the ILC about the choice to use the wording "seek" instead of

⁹⁴ Plappert S. (2020). 'Humanitarian Intervention' in Sellers M., Kirste S. (eds.) *Encyclopedia of the Philosophy of Law and Social Philosophy*. Dordrecht: Springer, p.1.

⁹⁵ Wood W. B. (1996) 'From humanitarian relief to humanitarian intervention: victims, interveners and pillars', in *Political Geography*, vol.15, No.8, p.671.

⁹⁶ ILC (2016). Draft Articles on the protection of persons in the event of disasters with commentaries - commentary to Article 11, para.1

“requesting” assistance, any response to the affected State’s seeking of assistance is anyway subject to its consent, that, as will be demonstrated, is a pivotal requirement in *any* circumstances.

If, on the one hand, affected states have a duty to seek assistance, on the other hand possible assisting actors are entitled to offer assistance. In this case the ILC and the *Institut de Droit International* were not likeminded in their definition of third-parties’ role: the ILC, in its Draft Articles, refers to the possibility of offering assistance, for the abovementioned reasons, while the *Institut de Droit International* identifies a right to offer assistance for State and Organizations and affirms that

all States should to the maximum extent possible offer humanitarian assistance to the victims in States affected by disasters, except when such assistance would result in seriously jeopardizing their own economic, social or political conditions. Special attention should be paid to disasters affecting neighboring States⁹⁷.

There are good reasons for both approaches. However, at least as far as States and International Organizations are concerned, most scholars and analysts are more inclined to side with the *Institut de Droit International* point of view in identifying the presence of a right to offer assistance. They recall that in disaster situations human rights are at risk of being violated and that human rights possess an *erga omnes* character. This means that the obligation to protect, respect and fulfill them is owed to the international community at large because all States have an interest in seeing them respected: it is exactly for this universal interests in protecting human rights that States and International Organizations should be recognized a legitimate right to offer assistance⁹⁸.

Always in relation to the offer of assistance, doubts were also raised about the fact that they could amount to an indirect illegitimate intervention in internal affairs. However, the ILC in the final commentary to Art.12, making also reference to the Resolution of the *Institut de Droit International* on “the Protection of Human Rights and the Principle of Non-intervention in Internal Affairs of States” (1989)⁹⁹, claimed that

⁹⁷ Institut de Droit International (2003). Bruges Resolution.

⁹⁸ Zorzi Giustiniani F. (2012). ‘The Works of the International Law Commission on Protection of Persons in the Event of Disasters. A Critical Appraisal’ in de Guttery et al. (eds.) *International Disaster Response Law*. 1st edn. The Hague: T.M.C. Asser Press, p.82.

⁹⁹ Institute of International Law (1989). The Protection of Human Rights and the Principle of Non-intervention in Internal Affairs of States.

such offers of assistance cannot be regarded as interference in the affected State's internal affairs. This conclusion accords with the statement of the Institute of International Law in its 1989 resolution on the protection of human rights and the principle of non-intervention in internal affairs of States: 'An offer by a State, a group of States, an international organization or an impartial humanitarian body such as the International Committee of the Red Cross, of food or medical supplies to another State in whose territory the life or health of the population is seriously threatened, cannot be considered an unlawful intervention in the internal affairs of that State'¹⁰⁰.

Indeed, the principle of non-intervention in internal affairs requires the presence of an intervention and that intervention "must [...] be one bearing on matters in which each State is permitted, by the principle of State sovereignty, to decide freely"¹⁰¹, as the ICJ spelt out in the merits of the groundbreaking judgement on the Nicaragua Case. From this definition, it is evident that a simple offer of assistance that does not imply any kind of intervention prior to the affected State's consent cannot be considered as an unlawful intervention in internal affairs, also because the State is subsequently perfectly independent in its decision to accept or not a given offer of assistance, though IDRL provides for some constraints to this freedom of choice.

This said, what should ideally occur when a disaster exceeds national capacities is the following: the affected State acknowledges its need of assistance, and consequently seeks and then accepts (all or just some) offers of international aid. Unfortunately, it happened several times that affected States refused to accept international assistance, even though it was clear that the scale of the disaster made an adequately sufficient and effective domestic response quite impossible; such an occurrence may be due to political reasons related to the reluctance to show weakness and unpreparedness. This was the case of Cyclone Nargis that hit Myanmar in 2008; the government failed to recognize the magnitude of the disaster and initially refused any kind of international aid, leading to a worsening of the situation for the affected population. The same can be said for the Chernobyl nuclear accident when, first, the Soviet Union failed to share adequate information about the nuclear accident with the international community with the consequent terrible effects not only for the affected population but for the entire European population, and second, as the IFRC explains,

¹⁰⁰ ILC Draft Articles on the Protection of Persons in the Event of Disasters, with commentaries, Article 12, p.33, para 3;

¹⁰¹ ICJ (1986). *Case concerning Military and Paramilitary Activities in and against Nicaragua (Nicaragua v. U.S.)*, Merits, p.108, para. 204.

after the Armenian earthquake (December 1988) the Soviet Union accepted international relief assistance for the first time since the 1920s [emphasis added]. This created a favorable context for starting international cooperation for Chernobyl. In June 1989 the USSR accepted a team of World Health Organization (WHO) experts to assess the situation in the affected areas¹⁰².

This demonstrates how the Soviet Union refused international help in the immediate aftermath of the disaster.

However, it has to be acknowledge that, at the time of the Chernobyl nuclear accident, the field of IDRL was rather underdeveloped if compared to today's state of affairs, so States were not subjected to the current international constraints and duties. What can be said is that the behavior of the Soviet Union triggered a deep debate about disaster response both the field of International Nuclear law and IDRL, and the same did the natural disasters of the early 21st century, including especially Cyclone Nargis, that drew again critical attention to the problems related to international disaster relief.

So, what can be done under International Law when affected States do not cooperate and they are not able to cope with the consequences of a disaster effectively? It is important to stress again that here the issue regards the situation in which the affected States is not able to manage the emergency adequately because the circumstances are too severe for its domestic capacities. The ILC tried to provide an answer to this question by trying to impose some limits to the absolute exercise of State sovereignty, thus striking a balance between the interest of affected States, affected population and international community, but as Michael Boethe claims, cited in Heath, "[it]did not tackle the 'big' problems of whether a state has a duty to 'undertake or accept relief'"¹⁰³. It is exactly on the identification of a duty to accept assistance that scholars and experts are now focusing, engaging in a process of progressive development of the law, since, as noted above, this is a realm in which state practice is not always homogenous.

The aim of this undertaking is to find an alternative for which the paramount principles of sovereignty and non-intervention can go along with the protection of the population. As Heath suggests, there are two ways in which an obligation to accept humanitarian assistance can be developed without clashing with the respect of the notions of sovereignty and non-intervention:

¹⁰² IFRC.(2016). *REVIEW Chernobyl Humanitarian Assistance and Rehabilitation Programme (CHARP),1990–2012*. Geneva: International federation of the Red Cross and Red Crescent Societies.

¹⁰³ Heath J. B. (2011). 'Disasters, Relief, and Neglect: the Duty to Accept Humanitarian assistance and the Work of the International Law Commission', in *the New York University Journal of International Law and Politics*, Vol.43, No.2, p.422.

the first one provides for a redefinition of the notion of sovereignty in such a way as to comprise the concept of responsibility towards the population; the second, focuses on the already well-established duty to cooperate with the aim of protecting Human Rights; this duty should serve as a constraint against an absolute qualification of state sovereignty, so that, according to this view, present international laws compel States to accept assistance when national capacities are overwhelmed by the circumstances¹⁰⁴.

3.1.1. The possible presence of a duty to accept assistance, identified through the redefinition of the notion of State Sovereignty.

Regarding the first possibility, it is based on a progressive interpretation of the meaning of State sovereignty and non-intervention. Traditionally, State sovereignty was intended to create a so-called *domain réservé* in which States had absolute discretionary power. If we consider the traditional notion of State sovereignty that emerged after the establishment of the Westphalian state system, it referred to “the whole body of rights and attributes which a State possesses in its territory, to the exclusion of all other States, and also in its relations with other States”¹⁰⁵; therefore, it gave the State the power to decide what was better for its citizens which can include the right to decide whether to consent to the provision of international assistance or not. However, this traditional conception was gradually limited by International Law that led to a shrinking of the *domain réservé*, so that today States are bound to specific norms when it comes to take decisions about its population, where the most important are the rules concerning the respect, protection and fulfillment of human rights¹⁰⁶. Along these lines and acknowledging that the international law system was not being successful in the prevention of gross violation of human rights, the UN Secretary General Kofi Annan, back in 1999, urged member states to find a solution regarding the apparent incompatibility between the principle of non-interference and the need to address gross violations of human rights. The result of this appeal was the final report entitled “Responsibility to

¹⁰⁴ Heath J. B. (2011). ‘Disasters, Relief, and Neglect: the Duty to Accept Humanitarian assistance and the Work of the International Law Commission’, in *the New York University Journal of International Law and Politics*, Vol.43, No.2, p.427.

¹⁰⁵ Álvarez A. (1949). *Individual Opinion by Judge Álvarez*, Corfu Channel Case (UK v. Alb.), ICJ, p.43.

¹⁰⁶ Heath J. B. (2011). ‘Disasters, Relief, and Neglect: the Duty to Accept Humanitarian assistance and the Work of the International Law Commission’, in *the New York University Journal of International Law and Politics*, Vol.43, No.2, pp.428-429.

Protect”, delivered by the International Commission on Intervention and State Sovereignty (ICISS)¹⁰⁷.

Nevertheless, the idea that sovereignty entailed a responsibility on the part of the State to protect people on its territory and that international humanitarian intervention was to a certain extent justified when the States failed to fulfil its obligations under IL was not new. Indeed, back in 1625, in the book *De Jure Belli Ac Pacis Libri Tres*, Hugo Grotius contemplated that “wars can be undertaken to enforce or defend not only one’s own rights but also those of other”¹⁰⁸, so interventions to defend foreign populations in need was considered a form of *just war*. More recently, Judge Alejandro Álvarez, in his separate opinion in the Corfu Channel Case admitted that

this notion [State sovereignty] has evolved, and we must now adopt a conception of it which will be in harmony with the new conditions of social life. We can no longer regard sovereignty as an absolute and individual right of every State, as used to be done under the old law founded on the individualist régime, according to which States were only bound by the rules which they had accepted. To-day, owing to social interdependence and to the predominance of the general interest, the States are bound by many rules which have not been ordered by their will. [...] Every State is bound to preserve in its territory such order as is indispensable for the accomplishment of its international obligations¹⁰⁹.

R2P is based on three pillars: the first one stresses the primary responsibility of States to protect its population from severe violations of human rights and to prevent them; the second pillar concentrates on the responsibility of the international community in giving support and pushing States to comply with their responsibility to protect; the third pillar makes reference to the responsibility of the international community “to take timely and decisive action, in accordance with the United Nations Charter and in cooperation with relevant regional organizations, when national authorities manifestly fail to protect their populations”¹¹⁰ in the name of the international interest in the non-violation of human rights; in addition, said intervention must be authorized by the UNSC. From this standpoint, the ICISS, within the framework of the responsibility to protect, detected

¹⁰⁷ Zifcar S. (2018). ‘The Responsibility to Protect’ in Evans M. D. (ed.) *International Law*. Fifth edition. New York: Oxford University Press, pp. 490-491.

¹⁰⁸ Remec P. P. (1960). *The Position of the Individual in International Law according to Grotius and Vattel*. The Hague: Springer Netherlands, p.96.

¹⁰⁹ Álvarez A. (1949). *Individual Opinion by Judge Álvarez, Corfu Channel Case (UK v. Alb.)*, ICJ, pp.43-44

¹¹⁰ UN – Office on Genocide Prevention and the Responsibility to Protect (n.d.). *Responsibility to Protect*. Available at: <https://www.un.org/en/genocideprevention/about-responsibility-to-protect.shtml> (accessed: 28 December 2020)

three sub-responsibilities: responsibility to prevent, responsibility to react, responsibility to rebuild. In brief, this framework reaffirms the important of State sovereignty and the principle of non-intervention that derives from it, but it also stresses that sovereignty brings along a responsibility towards the population. From this acknowledgment, R2P established a primary responsibility incumbent on States to protect those under its jurisdiction, and at the same time it recognize the presence of a secondary obligation for all other States to ensure protection to those people whose States fails to do so¹¹¹.

However, R2P, as adopted at the 2005 World Summit, is applicable only in four specific circumstances: genocide, war crimes, ethnic cleansing and crimes against humanity. All other circumstance that can cause great sufferings and constitute gross violations of human rights are excluded, including natural and man-made disasters, as affirmed by Secretary General Ban Ki-Moon in the Report Implementing the Responsibility to Protect¹¹², though the original report by the ICISS incorporated also natural disasters. It must be said that the application of R2P to other circumstances was discussed after Cyclone Nargis struck Myanmar when some States including France suggested to deliver humanitarian assistance even without Myanmar consent, invoking the international community responsibility to protect, prior authorization of the UN Security Council¹¹³. The outcome of these discussions was not positive because the other members of the Security Council (China, Indonesia, Vietnam) were not like-minded. They claimed that such action was a clear violation of the principle of non-intervention and States Sovereignty, the situation did not constitute “a threat to international peace and security” and R2P, as endorsed in 2005, did not include other circumstances other than genocide, war crimes, crimes against humanity and ethnic cleansing¹¹⁴. After this event, the ILC as well considered the application of the R2P to its work on the Protection of Persons in the Event of Disasters. Also in this case the possibility to apply the doctrine in cases of natural or man-made disasters was excluded, in light of the what was affirmed by the Secretary General Ban Ki-Moon. Moreover, the Special Rapporteur stated that “nothing can be clearer than the fact that forced intervention is illegal under international law absent a justifiable claim of self-

¹¹¹ Heath J. B. (2011). ‘Disasters, Relief, and Neglect: the Duty to Accept Humanitarian assistance and the Work of the International Law Commission’, in *the New York University Journal of International Law and Politics*, Vol.43, No.2, p.430.

¹¹² UNGA (2009). Implementing the Responsibility to Protect – Report of the Secretary General, A/63/677.

¹¹³ Rucktäschel K., Schlegel S. (2017). ‘Dilemmas for disaster relief – The cases of Myanmar, Haiti and Aceh through the lenses of national sovereignty and international intervention’ in Neuhäser C., Schuck C. (eds.) (2017). *Military Interventions – Considerations from Philosophy and Political Science*. Baden: Nomos Verlagsgesellschaft MbH & Co, pp. 110-111.

¹¹⁴ Ibid.

defense or action by the Security-Council, even under some invocation of the responsibility to protect, understood in its original narrow context”¹¹⁵. This opposition to the application of the R2P to natural or man-made disasters is due to two reasons: political reasons and the strong connection of the Responsibility to Protect to the use of military force whose application for the delivery of humanitarian aid in cases of disasters not caused by armed conflicts can be problematic¹¹⁶.

However, even considering R2P as it is, limited to the aforementioned four instances, some scholars assume that in specific and extremely exceptional circumstances it could, in principle, be invoked. It must be said this is a very unlikely situation but, considering the definition of crimes against humanity provided by the Statute of the ICC, at Article 7(2b) it is possible to read that “‘extermination’ includes the intentional infliction of conditions of life, inter alia the deprivation of access to food and medicine, calculated to bring about the destruction of part of a population”¹¹⁷. Following this definition, as Rucktäschel and Schlegel assume, “the R2P de jure could be invoked after a natural catastrophe if national disaster relief institutions intentionally and systematically refuse to act in order to exterminate parts of the population while at the same time not allowing international aid”¹¹⁸. Even though this statement refers to natural disasters, it is equally applicable to man-made disasters or it can even be considered more relevant in those cases because man-made disasters can secretly be intentional and carried out to exterminate part of the population. To sum up, according to this first approach to find a justification for the identification of a duty to accept assistance, States are compelled to accept assistance when the consequences of a disastrous event exceed domestic capacities in accordance with their responsibility to protect. If they fail to act accordingly, the international community is entitled to intervene under the R2P doctrine. However, even though this possibility was initially contemplated, the member States of the UN have discarded it.

3.1.2. The possible presence of a duty to accept assistance, identified through the duty to cooperate in the context of Human Rights Law.

¹¹⁵ Valencia-Ospina (2009). ‘Speech to the International Law Commission (July 10, 2009)’ in Heath J. B. (2011). ‘Disasters, Relief, and Neglect: the Duty to Accept Humanitarian assistance and the Work of the International Law Commission’, in *the New York University Journal of International Law and Politics*, Vol.43, No.2, p.423.

¹¹⁶ Heath J. B. (2011). ‘Disasters, Relief, and Neglect: the Duty to Accept Humanitarian assistance and the Work of the International Law Commission’, in *the New York University Journal of International Law and Politics*, Vol.43, No.2, pp. 433-434.

¹¹⁷ ICC (2011). Rome Statute of the International Criminal Court, Article 7(2b).

¹¹⁸ Rucktäschel K., Schlegel S. (2017). ‘Dilemmas for disaster relief – The cases of Myanmar, Haiti and Aceh through the lenses of national sovereignty and international intervention’ in Neuhäser C., Schuck C. (eds.) *Military Interventions – Considerations from Philosophy and Political Science*, Nomos Verlagsgesellschaft MbH & C, p.112.

The second line of thought for the identification of an obligation to accept assistance departs from the idea of State sovereignty as it is today, namely limited and constrained by wide number of internationally-accepted legal norms, the most important of which are those on human rights. Human rights are embodied in treaties, but they are also part of customary international law, so they create universal obligations; plus, human rights are obligations *erga omnes*, so they are not characterized by a bilateral or multilateral relation; instead, they are owed to the whole international community and some of them are even *jus cogens* norms, meaning non-derogable obligations. In this framework, a duty to accept humanitarian assistance can be derived, through progressive development, from present obligations States have under international human rights law.

The consequences of both natural and man-made disasters can seriously jeopardize the enjoyment by the affected population of their non-derogable right to life. Most importantly, people can die not only because of the severity of the disaster but also as a consequence of the ill-management of the emergency. Here, the interpretation of the meaning of the right to life provided by HRC is fundamental. It asserts that “the right to life is a right which should not be interpreted narrowly. It concerns the entitlement of individuals to be free from acts and omissions that are intended or may be expected to cause their unnatural or premature death, as well as to enjoy a life with dignity”¹¹⁹. Applying this definition to disaster situations, the affected State is obliged to take actions or not to take actions (so there are both positive and negative obligations) that are expected to cause the possible death some individuals and the failure to accept foreign assistance can be a relevant omission in this case.

Also the International Covenant on Economic, Social and Cultural rights is very relevant since it embodies the right to an adequate standard of living that comprises access to adequate food, clothing and housing and the highest attainable standard of physical and mental health. In light of the importance of the respect of these rights, the Covenant, at Art.2, provides that

Each State Party [...] undertakes to take steps, individually and through international assistance and co-operation, especially economic and technical, to the maximum of its available resources,

¹¹⁹ Human Rights Committee (2018). General comment No. 36 (2018) on article 6 of the International Covenant on Civil and Political Rights, on the right to life – CCPR/C/GC/36.

with a view to achieving progressively the full realization of the rights recognized in the present Covenant by all appropriate means [...] ¹²⁰.

The clear meaning of this provision was explained by the Committee on Economic, Social and Cultural Rights in 1990; it “notes that the phrase ‘to the maximum of its available resources’ was intended by the drafters of the Covenant to refer to both the resources existing within a State and those available from the international community through international cooperation and assistance”¹²¹. This means that, in order to ensure the realization of the abovementioned rights, that can be jeopardized by the advent of disastrous events, affected States are compelled to seek and accept international humanitarian assistance.

To these two instruments, it is worth adding the Convention on the Rights of Persons with Disabilities that explicitly establish that “States Parties shall take [...] all necessary measures to ensure the protection and safety of persons with disabilities in situations of risk, including situations of armed conflict, humanitarian emergencies and the occurrence of natural disasters”¹²², and the African Charter on the Rights and Welfare of the Child that at Art.23 provides that internally displaced children shall be granted adequate humanitarian assistance.

The obligation to accept humanitarian assistance, as a consequence, is strictly linked to the idea of cooperating with international actors in order to ensure the protection, respect and fulfillment of human rights, where the duty to cooperate is spelt out, *inter alia*, in the UN Charter and in the Declaration on Friendly Relations, as previously noted. However, the UN Charter poses great importance on the principles of States sovereignty and non-intervention too; in this regard, Peter MacAlister-Smith assumes that “the principle of cooperation holds a central place in the United Nations Charter, such that the foundational principles of sovereignty, territorial integrity, and non-intervention should be balanced against the duty to cooperate for the sake of human rights and fundamental freedoms”¹²³.

So, starting from the interpretation of the aforementioned provisions, a duty to accept assistance could well be inferred. Nevertheless, there is not general consensus on its existence and legitimacy yet and this is mainly caused by the fact that its development is based primarily on comments and

¹²⁰ International Covenant on Economic, Social and Cultural Rights, Article 2.

¹²¹ Committee on Economic, Social and Cultural Rights (1990). CESCR General Comment No. 3: The Nature of States Parties’ Obligations (Art. 2, para. 1, of the Covenant).

¹²² Convention on the Rights of Persons with Disabilities, Article 11.

¹²³ Heath J. B. (2011). ‘Disasters, Relief, and Neglect: the Duty to Accept Humanitarian assistance and the Work of the International Law Commission’, in *the New York University Journal of International Law and Politics*, Vol.43, No.2, p.411.

interpretations provided by treaty-based bodies but they are not binding. Despite this, it should be stressed that they are authoritative so they can help in the establishment of a rule of customary international law, being considered as a show of *opinio juris*.

3.1.3. *The duty not to arbitrarily withhold consent.*

The previous pages discussed the possible progressive development of international law in establishing an obligation to accept international humanitarian assistance when the affected State is not able to cope adequately with the consequences of a disaster. The aim of this advancement is to avoid situations like the one that occurred in the case of Cyclone Nargis when Myanmar was unable to provide appropriate assistance to its population and international aid was initially refused and then allowed only in limited areas. However, this does not mean that all offers of assistance must be accepted and that assistance must be accepted in any case. There are instances in which the refusal of international aid is perfectly legitimate. Valid reasons to refuse are for instance if the affected States has the situation under control, the offer of humanitarian assistance does not fit the needs, so it is inappropriate (for example this might be the case in which food is offered but what is needed are medicines), enough offers to satisfy the needs of the population have already been accepted, therefore consent to further offers can be counterproductive and only cause chaos, it does not respect the requirement of solidarity, impartiality and non-discrimination, or humanitarian assistance can also be validly withhold if there is well-founded fear that the actor putting it forward can act inappropriately thus using humanitarian assistance as a pretext for the advancement of other interests¹²⁴.

To recap, humanitarian assistance is believed to be always subject to the affected State's consent; under some circumstances it seems that affected States are under the obligation to accept some form of assistance in order to satisfy the needs of the population and guarantee the fulfillment, respect and protection of human rights; but, in accordance with the principle of State sovereignty and non-intervention, affected States have discretionary power and can refuse assistance for valid reasons; this means that they cannot arbitrarily withhold consent, but any refusal must be validly motivated. Furthermore, for the reasons explored before, an arbitrary withhold of consent can amount to a breach of States' obligations under international human rights law.

¹²⁴ Sivakumaran S. (2015). 'Arbitrary withholding of consent to humanitarian assistance in situations of disaster', in *International and Comparatively Law Quarterly*, Vol. 64, pp.21-24.

In the field of IDRL, the obligation not to arbitrarily withhold consent to international support or aid is incorporated in several soft-law instruments like the Compostela and Bruges Resolutions of the *Institut de Droit International*, the ILC Draft Articles on the Protection of Persons in the Event of Disasters, the Guiding Principles on Internal Displacement, and a Council of Europe Resolution, dating back 2006¹²⁵, always on the issue of internally displaced persons¹²⁶. Moreover, similar provisions can also be found in binding instruments like in Resolutions of the UN Security Council (e.g. Resolution 2139 about the conflict in Syria)¹²⁷, and in the realm of IHL, specifically in Additional Protocol 1 to the Geneva Conventions of 1949, which, again, reflects the close link between the two branches¹²⁸. Despite this, the possible customary character of the provision is still unclear and debated¹²⁹.

So, it is widely accepted, though not clearly of customary character, that consent does not have to be withheld arbitrarily, but what does arbitrarily mean? The ILC, in its commentary to Art. 13 does not clarify the matter and, apart from indicating some instances in which the refusal is valid that corresponds basically to those instances listed above, it states that “the determination of whether the withholding of consent is arbitrary must be determined on a case-by-case basis [...]. [...] where an offer of assistance is made in accordance with the draft articles and no alternate sources of assistance are available, there would be a strong inference that a decision to withhold consent is arbitrary”¹³⁰. Further information on the meaning of “arbitrary” can be derived from the Bruges Resolution that speaks of “not arbitrarily or unjustifiably reject”¹³¹ an offer of assistance, and from the talks during the drafting of Additional Protocol I of the Geneva Conventions of 1949 that discussed the presence of valid reasons, and not arbitrary or capricious ones, to refuse humanitarian relief¹³². Nevertheless, the highest degree of clarity and specificity can be attained borrowing from

¹²⁵ See Council of Europe – Committee of Ministers (2006). *Recommendation Rec(2006)6 of the Committee of Ministers to member states on internally displaced persons*. Available at: <https://rm.coe.int/16806b5aaf> (accessed: 2 January 2021)

¹²⁶ Sivakumaran S. (2015). ‘Arbitrary withholding of consent to humanitarian assistance in situations of disaster’, in *International and Comparatively Law Quarterly*, Vol. 64, , p.507.

¹²⁷ See UNSC (2014). Resolution 2139 Adopted by the Security Council at its 7116th meeting on 22 February 2014, S/RES/2139.

¹²⁸ *Ibid.*, pp.512-513.

¹²⁹ Health J. B. (2011). ‘Disasters, Relief, and Neglect: the Duty to Accept Humanitarian assistance and the Work of the International Law Commission’, in *the New York University Journal of International Law and Politics*, Vol.43, No.2, p. 456.

¹³⁰ ILC Draft Articles on the Protection of Persons in the Event of Disasters, with commentaries, Article 13, p. 46, para. 8.

¹³¹ Institute of International Law (2003). Bruges Resolution, Article 8.

¹³² Sivakumaran S. (2015). ‘Arbitrary withholding of consent to humanitarian assistance in situations of disaster’, in *International and Comparatively Law Quarterly*, Vol. 64, p. 517.

human rights law. Indeed, according to the Report of the Working Group on Arbitrary Detention of the Human Rights Council

the notion of 'arbitrary' *stricto sensu* includes both the requirement that a particular form of deprivation of liberty is taken in accordance with the applicable law and procedure and that it is proportional to the aim sought, reasonable and necessary. The drafting history of article 9 of the International Covenant on Civil and Political Rights 'confirms that 'arbitrariness' is not to be equated with 'against the law', but must be interpreted more broadly to include elements of inappropriateness, injustice, lack of predictability and due process of law¹³³.

Therefore, the notion of arbitrariness is a broad one and entails also those of proportionality, reasonableness, necessity and appropriateness. Moreover, the ILC introduced another element to assess the arbitrariness of the denial of consent; it "[...] encourages affected States to give reasons where consent to assistance is withheld. The provision of reasons is fundamental to establishing the good faith of an affected State's decision to withhold consent. The absence of reasons may act to support an inference that the withholding of consent is arbitrary"¹³⁴. In other words, affected States have to justify their decision to withhold consent to demonstrate that the decision was not arbitrary. This requirement, as well as that of proving the non-arbitrariness of the decision, is important also to show that the reason to reject the offer is valid.

The problem related to the notion of arbitrariness is also that of deciding who is entitled to assess whether a withhold of consent was arbitrary or not, and valid. This aspect is still tricky but, since the provision of humanitarian assistance is strictly connected to the protection, respect and fulfillment of human rights and human rights are *erga omnes* obligations, the arbitrariness could be assessed by the ICJ, human rights courts (e.g. ECtHR), treaty-based bodies, or arbitral tribunals in the context of a judgement to identify the responsibility of the affected State for violation of human rights, invoked by any member of the international community.

Fortunately, the cases in which the consent to humanitarian assistance was denied are few. This is due in part also to the media coverage that large scale natural and man-made disasters receive. Of course, if images of devastation and human suffering spread so widely, there is very high

¹³³ Human Rights Council (2012). Report of the Working Group on Arbitrary Detention A/HRC/22/44 – deliberation No.9 concerning the definition and scope of arbitrary deprivation of liberty under customary international law, p.21, para. 61.

¹³⁴ ILC Draft Articles on the Protection of Persons in the Event of Disasters, with commentaries, Article 13, p. 46, para. 10.

international pressure on the affected State to consent to humanitarian aid, especially if there are people of other nationalities that might be involved and badly affected by it. This pressure comes especially from the exercise of diplomatic protection from foreign countries that want their nationals to be treated fairly, in accordance with international provisions.

3.2. Disaster preparedness and related challenges to coordinate actions in a situation of emergency

Once a natural or man-made disaster has occurred, the affected State has the primary responsibility to provide assistance to its population, alone or, if the magnitude of the disaster overwhelms domestic capacities, with the help of international actors. The main challenge in the provision of assistance consists in coordinating relief activities appropriately, and in this case as well the State has the primary role to provide a well-organized coordination scheme. This is clearly spelt out by the General Assembly Resolution 46/182 that will be frequently mentioned in the following pages since it laid the basis for the establishment of the UN-led international humanitarian system of coordination. It states that

1. Humanitarian assistance is of cardinal importance for the victims of natural disasters and other emergencies. [...]. 5. Each State has the responsibility first and foremost to take care of the victims of natural disasters and other emergencies occurring on its territory. Hence, the affected State has the primary role in the initiation, organization, coordination, and implementation of humanitarian assistance within its territory¹³⁵

This provision is similarly reported also in the ILC Draft Articles at Art.10, among others. It is important to point out how both instruments provide for the primary responsibility of the affected State to provide assistance to its population, thing that might require it to seek international assistance; however, according to the ILC, affected States have the primary role, not responsibility, to direct, control and coordinate it. The reason for this choice is motivated in the ILC commentary to Art.10 which argues that a wording creating an obligation could result too restrictive and it does not fit situations in which States do not want to have a leading position in the coordination of

¹³⁵ UNGA (1991). Resolution 46/182 - Strengthening the coordination of humanitarian emergency assistance of the United Nations, Annex, Guiding Principles.

humanitarian assistance because of a lack of resources or expertise, while “role” entails a more flexible approach¹³⁶.

As far as the initiation of humanitarian assistance is concerned, its challenges were explored in the previous section while now its organization and coordination will be explored. First of all, it is useful to provide a definition of coordination. Coordination can be described as “the collaborative process in which organizations align their actions with the actions of other organizations to achieve a common objective”¹³⁷. As the definition itself suggests, coordination first entails collaboration among the different actors, but to collaborate efficiently they need to communicate effectively and to cooperate, namely to work together and in synergy in order to achieve a common objective that, in the case of disasters, consists of course in the alleviation of people’s sufferings and satisfaction of the primary needs with the aim of guaranteeing the respect of human rights.

It can be said that the organization and coordination of humanitarian assistance is the salient and focal point of disaster relief because the possibility of providing adequate and timely assistance to the population in need, thus mitigating the adverse effects of disasters, depends essentially on them. The problem is that, despite this topic being scrutinized carefully and addressed in a very wide variety of instruments at different levels, putting in place an appropriate and efficient coordination plan is still fraught with obstacles and difficulties. The main problem is that a punctual domestic legal framework to coordinate national and foreign relief actors is not always developed. The “IDRL Guidelines for the domestic facilitation and regulation of international disaster relief and initial recovery assistance” emerged specifically to help States to fill their domestic gaps in this field but the presence of uncoordinated and chaotic responses to humanitarian emergencies testify how they have been poorly applied. This means that there is a lack of preparedness, a situation that is quite worrying for two main reasons: first, it shows a discrepancy between what is predicated at the international level where more and more attention is paid to the issue of reducing the impact of disasters on people and the environment through adequate preparation, and what is actually done at the domestic level; second, a lack of preparedness will give rise to increasingly dangerous and tragic consequences, because of the impact of climate change that is causing stronger and stronger natural phenomena and increasing the risk of man-made catastrophes.

Another complication derives from a sort of paradox: it is true that a high degree of attention has been paid to the issue of coordination of humanitarian aid, but this generated an intricate cobweb

¹³⁶ ILC Draft Articles on the Protection of Persons in the Event of Disasters, with commentaries, Article 10, para 6.

¹³⁷ Martin E., Nolte I., Vitolo E. (2016) ‘The four Cs of disaster partnering: communication, cooperation, coordination and collaboration’, in *Disasters*, Vol.40, No.4, pp. 624.

of mechanisms, standards and rules contained in binding sectoral or general treaties with a different level of internationalization, and soft law instruments, especially guidelines, framework for action and UNGA Resolutions. In other words, the challenge to put into practice actions for the domestic and international coordination of humanitarian assistance shows off the shortcoming of IDRL: its overlaps, gaps, inconsistencies and fragmented nature play against the effective management and coordination of humanitarian aid, especially when the importance of time is paramount¹³⁸.

In addition, there are other two big obstacles that can put at risk the possibility of delivering coordinated assistance and managing the consequences of disasters properly. First, unpredictability. An accurate risk assessment and emergency plan are surely of fundamental and vital importance, but when it comes to events that involve natural phenomena and/or technology, there is always a certain degree of unpredictability and uncertainty. A disaster management plan can assign tasks and charges precisely, but the specific and unpredictable circumstances of an event might render that plan impracticable or seriously inadequate. Consider for instance a disaster similar to that of 2011 in Japan: in that specific case, there was a combination of a natural and technological disaster, in the form of a magnitude 9 earthquake on the Richter scale, and an ensuing Tsunami that caused one of the two most serious nuclear accident in the history of nuclear energy production. The specific circumstances of the case and deficiencies of the Japanese emergency preparedness and response plans will be analyzed in detail in the following chapters but it is important to underline here how an initial event, most of the time predictable due to historical records of the precise area and studies, can trigger a chain of subsequent, often unpredictable, incidents. In cases of complex emergencies like that of Japan that involved the presence of a radiological emergency, entire areas must be evacuated and coordinators themselves might be displaced making pre-established on-site coordination more complicated, and it can also happen that infrastructure are seriously compromised and communications and collection of vital information are made impossible or very difficult. Of course, this consideration does not aim at diminishing the importance of the development of accurate assessment and emergency plans because, even though they are partially jeopardized by unpredictable occurrences, they anyway provide a framework for action.

Second, as De Siervo points out, “authorities usually have limited knowledge and understanding of the complexity, culture policies, procedures and working mechanisms of international relief

¹³⁸ De Siervo G. (2012) ‘Actors, activities, and coordination in emergencies’ in de Guttry et al. (eds.) *International Disaster Response Law*. 1st edn. The Hague: T.M.C. Asser Press, pp.486-488.

organizations, and vice versa [..., and] the number of actors present on the post disaster phase does not facilitate the task”¹³⁹. In this case, the requirement of consent for the delivery of international humanitarian assistance is fundamental in order to “make a selection” of those offers that are really helpful, adequate and appropriate. This is essential also in light of the presence of an increasing number of international actors and especially of new actors. Until some decades ago, the international actors involved in disaster response were limited, widely-, and well-know: agencies of international organizations, the International Federation of the Red Cross and Red Crescent Societies, and a few NGOs. This situation of somewhat deep knowledge of the relevant actors made coordination smoother. In contrast, today there is multitude of different non-governmental entities that can enter in the process of disaster relief, including an increasing number of new NGOs, non-state actors and even the corporate sector is gaining significance¹⁴⁰. This proliferation can be considered as an effect of globalization and the growing interdependence and interconnectedness: new means of communication make an almost real-time spread of information possible thus showing people’s suffering and destruction. This raises people’s awareness on the fact that they can be helpful in relieving these people’s suffering. For this reason, the international civil society is more and more at the forefront in emergency response. However, this growing involvement of new actors can be counterproductive because sometimes they are not adequately trained and prepared to act in complex situations, thus leading to a worsening of the situation; they are usually not aware of common standards of action and procedures, and they might also not act in conformity with the principles of neutrality, impartiality, humanity. Therefore, the fact for affected States of retaining some form of discretionary power on which actors to allow in their territories is the first step to permit to manage and coordinate actions more efficiently without being overwhelmed by the arrival of humanitarian aid that is superfluous or inadequate and thus counterproductive and detrimental for the affected population.

Lastly, pressure cannot be overlooked. In the case of natural and man-made disaster, the situation degenerates very quickly. The rapid worsening of the situation leads thousands of people to be at risk of losing their life, being seriously injured, losing their home and personal belongings simultaneously. This put very high pressure on national authorities that are called to act immediately but this immediate call for action can generate uncoordinated and chaotic management of the immediate post-disaster phase, especially when disaster preparedness and

¹³⁹ Ibid., p.489.

¹⁴⁰ Ibid., p.491

response plans are poor: sometimes it is better to take time to carry out rigorous briefing sessions to punctually coordinate actions, instead of mobilizing frantically as a consequence of pressure. In addition, States that appear overwhelmed by the circumstances of the event are pushed to seek international assistance by the public opinion at the domestic and international level, and the international community; so, as well as the inherent pressure generated by the circumstances, there is also external pressure; however, in this pressing and rapidly changing environment that characterizes the immediate phases after the outbreak of a disaster, affected States are not able to compile an accurate needs assessment that reflects the real necessities of the population. For this reason, humanitarian assistance is, at first, “standard” and not based on what people actually need, thus there can be a useless oversupply of some goods and a lack of others because there is no domestic-international coordination.

Nevertheless, as it was noted at the end of section (3.1.3.), this kind of pressure can be positive in pushing States to accept some form of international assistance when there is reluctance by national authorities; the problem arises when it creates undue constraints on States ability to use their discretionary power to refuse unsuitable or unnecessary assistance¹⁴¹. Therefore, because of international and domestic pressure, States in critical situations are pushed to accept any kind of help, but, as underlined above, the arrival of any kind of commodity and personnel of any type and from diverse international actors unnecessarily burdens states authorities and complicates the already complex activity of control and coordination.

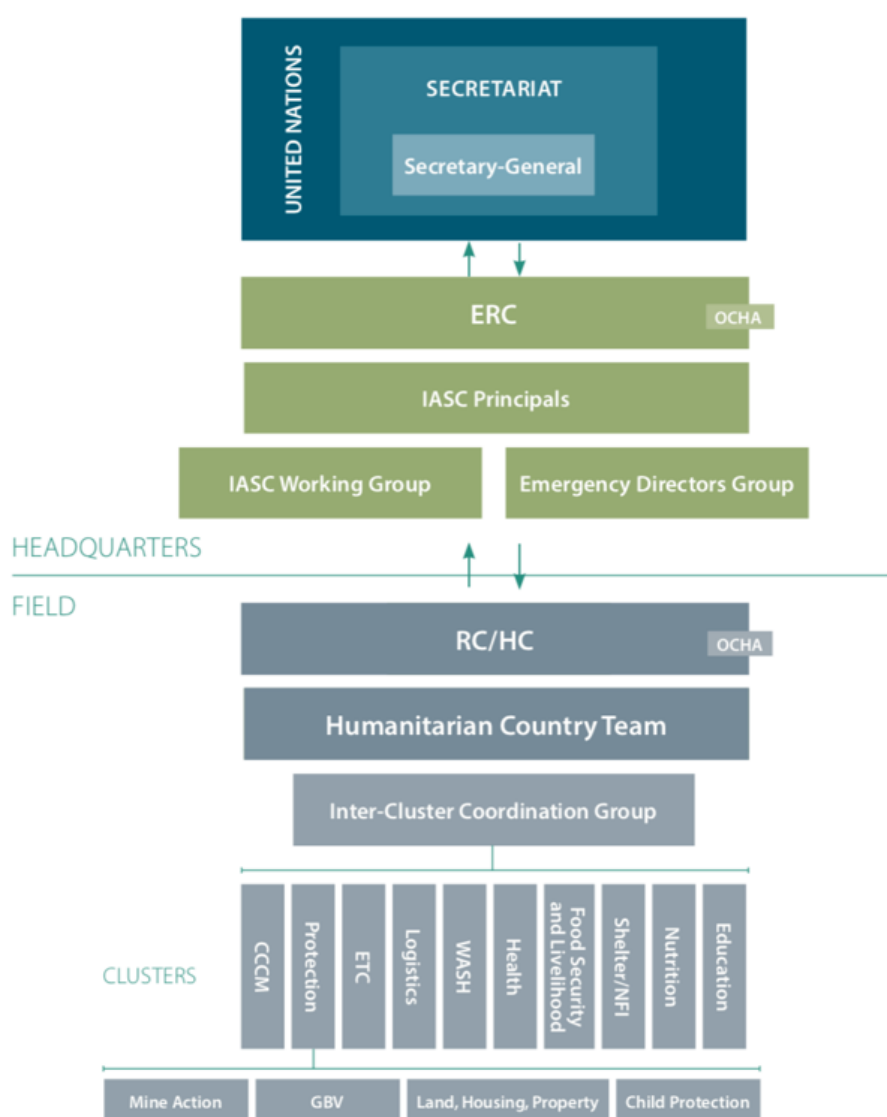
3.2.1. The domestic and international framework for the delivery of international humanitarian assistance.

As stated in the UNGA Resolution 46/182 and by the ILC in the Draft Articles at Art.10, the primary role for the coordination of humanitarian assistance, both domestic and international, is held by the affected State. However, domestic coordination abilities and resources can be insufficient to tackle severe situations or jeopardized by the circumstances itself. For this reason, starting symbolically with Resolution 46/182, a comprehensive UN mechanisms for international disaster relief coordination was established in order to assist affected States. The role of the UN in disaster situations is defined as having the purpose “to achieve international co-operation in solving international problems of an economic, social, cultural, or humanitarian character, and in promoting

¹⁴¹ Ibid., p. 496.

and encouraging respect for human rights and for fundamental freedoms for all without distinction as to race, sex, language, or religion”¹⁴².

The system is really articulated but its architecture can be simplified as reported in image (1). It represents the structure the way it is today, after some reforms that updated and revised the system set out in Resolution 46/182. One important thing to stress before analyzing the main actors and mechanisms of this UN-managed system is that its aim is to support affected States in their task of coordinating humanitarian actors and not to take over it.



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¹⁴² UN Charter, Article 1 (3). See, UN. (n.d.). *Deliver Humanitarian Aid*, UN – Peace, dignity and equality on a healthy planet, available at: <https://www.un.org/en/sections/what-we-do/deliver-humanitarian-aid/index.html>. (Accessed: 29 November 2020).

¹⁴³ Inter-Agency Standing Committee. (2016). *Introduction for humanitarian action – A brief guide for resident coordinators*. IASC, available at: <https://reliefweb.int/report/world/introduction-humanitarian-action-brief-guide-resident-coordinators> (accessed: 3 December 2020)

One of the main contributions to the strengthening of the coordination of international humanitarian assistance given by Resolution 46/182 lies in the creation of the Inter-Agency Standing Committee (IASC). It is “the longest-standing and highest-level humanitarian coordination forum”¹⁴⁴ that involves 18 different organizations, including several NGOs, and the Federation of Red Cross and Red Crescent Societies, as well as the UN funds, programmes, specialized agencies and bodies that are operative in the field of humanitarian assistance. To describe the function of the IASC in few words, it can be said that it provides guidance from above since it is entrusted with the task of “developing humanitarian policies, agreeing on a clear division of responsibility for various aspects of humanitarian assistance, identifying and addressing gaps, advocating for effective application of humanitarian principles, discussing and resolving disputes on system wide humanitarian issues”¹⁴⁵. In brief, the IASC provides a normative framework that allows it to supervise remotely the activities carried out at the country level and the mechanism of coordination put in place, in order to judge their appropriateness against the guidelines, standards and practices set by it.

Always in Resolution 46/182, the UNGA established the high-level figure of the Emergency Relief Coordinator (ERC). Resolution 46/182 reads as follows:

the leadership role of the Secretary-General is critical and must be strengthened to ensure better preparation for, as well as rapid and coherent response to, natural disasters and other emergencies. [...] To this end, [...] a high-level official (emergency relief coordinator) would be designated by the Secretary-General to work closely with and with direct access to him, in cooperation with the relevant organizations and entities of the system dealing with humanitarian assistance and in full respect of their mandates.¹⁴⁶

So, the ERC is a key figure in the mechanism for the coordination and provision of humanitarian relief that is constantly in contact with the UN Secretary-General to whom the ERC reports directly. He/she is both the chair of the IASC and the head of UN Office for the Coordination of Humanitarian Affairs (OCHA); for this reason, “S/he also acts as the central focal point for international

¹⁴⁴ Inter-Agency Standing Committee. (n.d.). *The Inter-Agency Standing Committee*. Available at: <https://interagencystandingcommittee.org/the-inter-agency-standing-committee>. (Accessed: 29 November 2020).

¹⁴⁵ ICVA. (n.d.) *The IASC and the global humanitarian coordination architecture*, ICVA humanitarian learning. Available at: https://reliefweb.int/sites/reliefweb.int/files/resources/Topic_1_humanitarian_coordination.pdf (accessed: 5 December 2020).

¹⁴⁶ UNGA (1991). Resolution 46/182 - Strengthening the coordination of humanitarian emergency assistance of the United Nations, Annex, Guiding Principles.

governmental, intergovernmental and non-governmental relief activities”¹⁴⁷ thus being a pivotal figure in the coordination mechanism and oversight of humanitarian responses that require the intervention of international actors. In line with his/her position, he/she entertains close relationships with the countries Resident Coordinators (RC). To be more specific regarding the relationship between the two figures, the ERC evaluate the work of the RC (whose functions will be described below) taking into consideration the reports and observations submitted by the organizations that are part of the IASC and that had been involved in on-site operations. Moreover, the ERC can decide to appoint the Resident Coordinator as Humanitarian Coordinator (RC/HC, if the Resident Coordinator is deemed competent to occupy this charge; otherwise, the ERC can decide to appoint a different person as Humanitarian Coordinator, different from the RC or to flank the RC with a qualified figure: the Deputy Humanitarian Coordinator), thus signaling the severity of the situation¹⁴⁸.

If the ERC and the IASC operate at the international level, so they coordinate and oversee the operations from above though in close relationship with the on-site activities, the RC is the main figure that operates at the country level, on-site. The Resident Coordinator works closely with States authorities, which, it must be recalled, have a primary role in controlling, coordinating, directing and supervising relief operations, and state-based organizations “for ensuring organizations work together to prepare themselves and to support the State in building its capacity to respond to an emergency”¹⁴⁹; in addition, he/she is the person entrusted with the task of assessing whether, after a disaster, the ensuing emergency requires the assistance of international actors. In case international assistance is requested and accepted by the affected States, the RC is charged with the coordination of all international humanitarian groups involved, the oversight of activities in order to ensure the respect of the affected State sovereignty and role, and the observance of the four basic principles that regulate the provision of humanitarian assistance: humanity, neutrality, Impartiality and independence¹⁵⁰. So, when a disaster strikes, the RC must identify and put in place the most appropriate coordinating mechanism taking into account the nature of the actors involved, including their mandates, the resources available to be used and the situational circumstances; this

¹⁴⁷ IASC. (2016). *Introduction to humanitarian action – A brief guide for resident coordinators*. Available at: <https://reliefweb.int/report/world/introduction-humanitarian-action-brief-guide-resident-coordinators> (accessed: 3 December 2020)

¹⁴⁸ Ibid.

¹⁴⁹ Ibid.

¹⁵⁰ REDLAC. (2011). *Guide for Governments 2011 – How the international system supports government disaster response*. Available at: https://reliefweb.int/sites/reliefweb.int/files/resources/Full_report_115.pdf (accessed: 10 December 2020)

has to be done in consultation with State's authorities and the national assistance providers, so that to integrate the national and international mechanisms of action¹⁵¹. In this regard, it is important to stress that the RC works in synergy with the authorities of the affected State in order to attain a common goal: relieve people's sufferings; so, the RC provides support and assistance but in no way the he/she substitutes or bypasses the affected State's authority. Indeed, in the case in which the affected State is unable or willing to provide adequate support to its population, the RC can exercise pressure on the government in order for it to comply with its international obligations and allow international aid to be delivered with the aim of ensuring the respect and fulfillment of human rights through the satisfaction of basic human needs, but at the same time he/she must respect States sovereignty, so any kind of foreign assistance is subject to States' consent.

Moreover, the RC chairs the Humanitarian Country Team (HCT), that is defined as a "strategic and operational decision-making and oversight forum"¹⁵². The HCT is the fulcrum of the organizational machine at country level. It includes a closed number of representatives of those organizations that are engaged in operations in the affected State like UN agencies, funds, and programmes, NGOs, the Federation of Red Cross and Red Crescent Societies; most importantly, it includes also the country representatives of the designated cluster lead agencies, if the cluster mechanism is activated. The number of representatives is limited in order to ensure a smoother, quicker and more effective process of decision-making¹⁵³. The main responsibilities HCTs lie in "agreeing on common strategic issues related to humanitarian action in-country [...]; agreeing on common policies [... and] promoting adherence by organizations that undertake humanitarian action in-country with humanitarian principles, principles of partnership, IASC guidelines and policies and strategies adopted by the HCT"¹⁵⁴. Of course, the HCT, under the direction of the RC/HC, should complement the coordination mechanisms devised by the affected State in order to foster collaboration and create the conditions for productive interactions and mutual effort towards a shared goal.

Between the IASC and ERC that operate mainly at the international level and the RC/HC and HCT operational at the national level, the Office for Coordination of Humanitarian Affairs (OCHA) creates

¹⁵¹ Inter-Agency Standing Committee. (2016). *Introduction to humanitarian action – A brief guide for resident coordinators*. Available at: <https://reliefweb.int/report/world/introduction-humanitarian-action-brief-guide-resident-coordinators> (accessed: 3 December 2020)

¹⁵² OCHA. (n. d.) *Humanitarian Country Team (HCT)*, HumanitarianResponse. Available at: <https://www.humanitarianresponse.info/en/operations/cameroon/humanitarian-country-team-hct> (accessed: 11 December 2020)

¹⁵³ Inter-Agency Standing Committee. (2009). *Guidance for Humanitarian Country Teams*. Available at: <https://interagencystandingcommittee.org/iasc-sub-working-group-leadership-and-humanitarian-coordination/iasc-guidance-humanitarian-country> (accessed: 9 December 2020).

¹⁵⁴ Ibid.

a bridge between the two levels. It was not formally established by the UNGA Resolution 46/182 but its roots can anyway be identified in that instrument: it was created in occasion of a programme of reforms of the system put in place by the Resolution that was carried out in 1998. OCHA is part of the UN Secretariat and it realizes and accomplishes its work of mobilization and prior overall coordination through the IASC.

Concerning the functions of OCHA, it systematizes and provides coordinating directives to humanitarian operators with the purpose of guaranteeing that people hit by disasters can obtain appropriate protection, support and assistance. In other words, it operates to facilitate the elimination of all those obstacles, mainly before but also during the actual deployment of forces in the affected territory, that jeopardize the provision of adequate humanitarian assistance¹⁵⁵. For example, OCHA tries to ensure that there are not duplications and useless overlaps in the type of assistance that is provided in order to avoid counterproductive confusion; it oversees that the assistance corresponds to the actual needs of the population; it establishes priorities and it also serves as information disseminator because it informs humanitarian actors of the context in which they are about to act and the primary needs of affected people, so that they all have a shared idea of the situation that is instrumental for the organization of coordinated action¹⁵⁶. In brief, OCHA plays a unique central role in the mobilization of international humanitarian aid and resources; for this reason, it works in the middle, between the IASC and the ERC which provide the overall framework for action, and the RC/HC that concretely organize and coordinate actions on-site. Depending on the severity of the situation, the RC/HC can also be directly assisted by OCHA experts and not just remotely. Accordingly, “OCHA is not an operational agency directly engaged in the delivery of humanitarian programmes, and its added value is as an honest broker, facilitator, thought leader and global advocate, providing support to the humanitarian system”¹⁵⁷. One of the most important things to note is that OCHA operates in accordance with several well-defined principles, including that of gender equality. This is fundamental for the discussion held in the subsequent chapters because the explicit acknowledgement of the importance of gender equality implies the recognition that men and women, girls and boys may have different needs and

¹⁵⁵ OCHA. (n.d.). *History of OCHA*. Available at: <https://www.unocha.org/about-ocha/history-ocha> (accessed: 3 December 2020).

¹⁵⁶ OCHA. (n.d.). *Coordination*. Available at: <https://www.unocha.org/our-work/coordination> (accessed: 3 December 2020)

¹⁵⁷ OCHA. (n.d.). *Humanitarian Country Team (HCT)*, HumanitarianResponse. Available at: <https://www.humanitarianresponse.info/en/operations/cameroon/humanitarian-country-team-hct> (accessed: 11 December 2020)

necessities and addressing these differences is fundamental to ensure that all people receive suitable help and assistance, so this acknowledgement is essential to coordinate and organize appropriately humanitarian action.

OCHA was entrusted with a new task when in 2005 the “Humanitarian Reform Agenda” was undertaken. It was promoted by the IASC and the ERC. The main outcome of this reform was the introduction of the so-called cluster approach.

The cluster approach consists in putting together, or dividing, humanitarian actors, both UN and non-UN, according to their field of action. There are 11 clusters, designated by the IASC and each cluster is led by a “cluster lead agency”: camp coordination and camp management, early recovery, education, emergency telecommunication, food security, health, logistics, nutrition, protection, shelter, and water, sanitation and hygiene. “The aim of the cluster approach is to strengthen system-wide preparedness and technical capacity to respond to humanitarian emergencies, and provide clear leadership and accountability in the main areas of humanitarian response. At country level, it aims to strengthen partnerships, and the predictability and accountability of international humanitarian action, by improving prioritization and clearly defining the roles and responsibilities of humanitarian organizations”¹⁵⁸. Starting from the assumption that humanitarian assistance is grounded on a need-based and human rights-based system, the fact of strengthening the cooperation among actors pertaining to the same field of action, as well as their preparedness to respond, results fundamental for a timely, cohesive and harmonized delivery of humanitarian aid and assistance. However, the cluster approach is instrumental not only for acting promptly and efficiently when disasters strike, but also for providing advice regarding the development of cluster-common policies, guidelines, plans of action and shared practices¹⁵⁹. In few words, clusters are working groups. In their capacity as assistance providers, clusters can be mobilized and the cluster approach activated in case gaps and inconsistencies in the coordination of humanitarian assistance are present and the affected state is not able to put in place a coordination apparatus suitable to meet people’s needs, prior assessment of the situation by the RC/HC and in consultation with States authorities¹⁶⁰.

¹⁵⁸ OCHA (n.d.). *What is the cluster approach?*, HumanitarianResponse. Available at: <https://www.humanitarianresponse.info/en/coordination/clusters/what-cluster-approach> (accessed: 12 December 2020)

¹⁵⁹ IASC. (2016). *Introduction to humanitarian action – A brief guide for resident coordinators*. Available at: <https://reliefweb.int/report/world/introduction-humanitarian-action-brief-guide-resident-coordinators> (accessed: 3 December 2020)

¹⁶⁰ Ibid.

Regarding the link between OCHA and clusters, it is in line with OCHA middle position: at the international level, it contributes to the development of guidelines, policies, common-practices and resolution of issues related to the inner organization of clusters, in close cooperation with cluster lead agencies; at the domestic level, it gives its support in guaranteeing that inter-, and intra-cluster coordination is well-working during all stages of disaster response¹⁶¹.

Of course the system is much more articulated than this, but the IASC/ERC, OCHA and RC/HC can be said to be the three pillars. Moreover, here much importance was given to the UN system of international humanitarian assistance coordination being the only one that operate at the global level, but there are other relevant mechanisms that are established at the regional level or that are based on multilateral or even bilateral relations. In this regard, an example of regional mechanism of coordination and collaboration is the EUR-OPA Major Hazards Agreement¹⁶² in the framework of the Council of Europe, or the European Community Civil Protection Mechanism in which the European Commission intervenes and plays a key role in coordinating humanitarian assistance operations activated through the mechanism¹⁶³. NATO as well is playing an increasingly important humanitarian role, also with respect to the international coordination of humanitarian relief operations with the creation in 1998 of the Euro-Atlantic Disaster Response Coordination Centre¹⁶⁴.

3.2.2. The importance of emergency preparedness, response and coordination through the lenses of the Fukushima nuclear accident.

An important example of the importance of coordination and preparedness and of the terrible consequences that gaps and inconsistencies can generate is the Fukushima nuclear accident. Assessment of the nuclear crisis management revealed that the situation was worsened and exacerbated by an overall lack of preparedness among TEPCO workers, as well as the top managers,

¹⁶¹ OCHA. (n.d.). *Who does what?*, HumanitarianResponse. Available at:

<https://www.humanitarianresponse.info/en/coordination/clusters/who-does-what> (accessed: 14 December 2020)

¹⁶² It is relevant for all the different aspects and phases related to disaster response, from disaster risk reduction to post-emergency reconstruction. Most importantly, for the treatment of the present topic, it provides a forum for strengthening States cooperation to enhance their preparedness to manage properly the consequences and challenges arising in the immediate aftermath of a natural or man-made disaster. See Council of Europe Portal (n.d.) *EUR-OPA Major Hazards Agreement – a tool for international cooperation*. Available at:

<https://www.coe.int/en/web/euoparisks/eur-opa-in-brief> (accessed: 9 December 2020)

¹⁶³ European Commission. (2020) *EU Civil Protection Mechanism*, European Civil Protection and Humanitarian Aid operations. Available at: https://ec.europa.eu/echo/what/civil-protection/mechanism_en (accessed: 15 December 2020).

¹⁶⁴ Fisher D. (2007). 'The Law of International Disaster Response: overview and ramifications for military actors' in Carsten M. D. (ed.) *Global legal challenges: command of the commons, strategic communication, and natural disasters*. Newport, RI: Naval War College, p.307.

and gaps and deficiencies in preparedness and coordination among the Japanese authorities and ministries that were competent in that occasion.

Immediately after the earthquake, fearing consequences for the nuclear power plants, a considerable number of offices and centers headed by the Prime Minister, competent ministries and TEPCO were set up both in Tokyo and in the Fukushima prefecture. The problem is that coordination and efficient communication among them was missing¹⁶⁵. Moreover, the off-site center that was designed to be a monitoring and coordination point close to the site of the emergency, especially in the event of nuclear accidents was non-operational. The problem was that due to the collapse of infrastructures caused by the earthquake, the personnel that was asked to manage the center did not manage to reach it; in addition, it had to be completely evacuated because it was not equipped to protect from radiations¹⁶⁶. Gaps in the coordination mechanism led to delays in the decision to pump water in order to cool the reactor that might have had a strong impact on how the situation evolved.

Nevertheless, coordination problems stemmed from lacunae in preparedness schemes. For instance, police forces and firefighters squads could be mobilized to help in the cooling operations and on-site emergency management operations, but they could not be employed because they were not trained to carry out such complex and dangerous tasks¹⁶⁷. Moreover, NISA (Nuclear and Industrial Safety Agency), that is the main body charged with the regulation and control of nuclear activities, lacked professionals, experts and capacity to address the situation properly; for this reason, “top NISA officials were unable to answer the questions posed by members of the crisis response team at the Prime Minister’s Office and offered no proposals to bring the accident under control”¹⁶⁸.

A third critical point was information sharing. First of all, Self Defence Forces did not possess a single accurate map of the Fukushima nuclear plant because of security regulation violation concerns on the part of TEPCO¹⁶⁹; but the most staggering evidence of the lack of preparedness and cooperation related to the dissemination of information lay in the functioning of SPEEDI, the System for Prediction of Environmental Emergency Dose Information. Information and predictions about the

¹⁶⁵ Sasakawa Peace Foundation. (2012). *The Fukushima nuclear accident and crisis management – Lessons for Japan - U.S. Alliance Cooperation*. Akasaka: The Sasakawa Peace Foundation, p.20

¹⁶⁶ *Ibid.*, p.21.

¹⁶⁷ Funabashi Y., Kitazawa K. (2012). ‘Fukushima in a review: a complex disaster, a disastrous response’, in *Bulletin of Atomic Scientists*, Vol.68, No.2, p.18.

¹⁶⁸ *Ibid.*, p.15.

¹⁶⁹ Sasakawa Peace Foundation. (2012). *The Fukushima nuclear accident and crisis management - Lessons for Japan-U.S. Alliance Cooperation*. Akasaka: The Sasakawa Peace Foundation, p.18.

diffusion of radiations were not officially spread to top government officials until 23rd of March, twelve days after the outbreak of the emergency. As a consequence of this, evacuation orders were emanated without having the assistance of SPEEDI data. The explanation provided by the Nuclear Safety Commission for this delay was that “it took time to coordinate between the Ministry of Education (MEXT) and the Nuclear Safety Commission on such issues as how the forecasts would be applied, published, and so on” ¹⁷⁰. In addition to this, and as a consequence of this lack of information communication that caused uncertainty, clear indications and definitions of evacuation areas were not immediately provided, thing that led to unnecessary confusion in the affected population. It also happened that because of unclear indications, people evacuated to areas that were even more contaminated¹⁷¹.

Delving more into specific issues, problems in preparedness and coordination always in the context of the Great East Japan Earthquake, ensuing tsunami and Fukushima nuclear accident exacerbated women’s sufferings. Japan’s history of dramatic natural disasters led to shed light on disaster-related gender issues; however, the accounts of what happened in 2011 demonstrate how lessons from previous terrible events were not fully learned. As far as emergency planning and preparedness is concerned, there is one plan in particular that is worth being mentioned: the Basic Plan for gender Equality. The Plan, that is periodically revised, stresses the importance of gender-equality in disaster preventive measures and points out the relevance of considering the different needs of men and women in the event of a disaster, needs that, to be addressed, require adequate preparedness¹⁷². Despite this theoretical attention, in the aftermath of 2011’s disaster, the gender Equality Bureau worked intensely in order to forward advice, also through the establishment of a dedicated website, and urge local authorities in the affected areas to take the gender-issue seriously especially in relation to violence against women in evacuation centers. Despite this, the reality fell short of recommendations issued. The cause lay again in a lack of adequate preparedness and coordination: the Gender Equality Bureau did not have enough power and autonomy to ensure coordination on the gender-issue across the whole set of government departments; second, the same government department on gender issues and that on disaster prevention were not sufficiently coordinated; lastly, part of the problem consisted in the increasing decentralization of

¹⁷⁰ Ibid., p.28.

¹⁷¹ Ibid., p.23.

¹⁷² Saito F. (2012). ‘Women and the 2011 East Japan Disaster’, in *Gender & Development*, Vol.20, No.2, p.267.

power: local authorities do not have enough preparation, the means or willingness to deal with gender issues, also because of the absence of women participation in decision-making¹⁷³.

As far as gender-related issues are concerned, it is relevant to notice that the UN humanitarian assistance architecture considers this aspect specifically through the IASC Gender Standby Capacity Project that deploys experts, the Gender Capacity Advisers, both during emergency and in normal times. They are entrusted the fundamental task of “[facilitating and strengthening] capacity and leadership of humanitarians to undertake and promote gender equality programming to ensure the distinct needs of women, girls, boys and men of all ages, are taken into account”¹⁷⁴.

One last thing to note about the case of Japan is that in the days following the disaster, the OCHA specialized staff was mobilized and intervened in the assistance of the Japanese Government for the coordination of the incoming humanitarian aid, and provision of precise and punctual information; this last task was carried out by the UNDAC (UN Disaster Assessment and Coordination) that is part of OCHA¹⁷⁵. Moreover, Japan asked also the intervention of a IAEA expert mission. These developments in the management of the disaster and nuclear emergency dates back 14th March 2011, three days after the earthquake. However, in the meanwhile, as discussed above, the lack of coordination and preparedness had already caused irreparable consequences for the evolution of the nuclear crisis and the health of the population.

In brief, to conclude, it can be said that this example is instructive because it shows how coordination is fundamental in order to prevent and avoid a possible worsening of the situation that, in the case exposed, has supposedly caused avoidable further suffering and grief. In turn, coordination and collaboration are possible only in presence of adequate preparedness, thing that lacked in Japan and that triggered a chain of delays, misunderstandings, bad and uncoordinated decisions. Such shortcomings can be patched up by the activation of international mechanisms of coordination. Patch up is the right term to utilize because international mechanisms complement and not supplement domestic systems of coordination and, in addition, as it has been described, they need some time to be mobilized and become fully operative, so domestic authorities must be anyway adequately prepared to face the moments that immediately follow the outbreak of a disaster: they cannot hope to fully rely on external help.

¹⁷³ Ibid., p. 268.

¹⁷⁴ OCHA. (n.d.) *GenCap*, HumanitarianResponse. Available at: <https://www.humanitarianresponse.info/en/coordination/gen-cap> (accessed: 20 December 2020)

¹⁷⁵ UN News. (2011). Japan: UN stepping up assistance in wake of quake and tsunami. Available at: <https://news.un.org/en/story/2011/03/368932-japan-un-stepping-assistance-wake-quake-and-tsunami> (accessed: 13 December 2020)

3.3. Access and operation of people within the borders of affected state: visas, privileges and immunities.

The last point that is worth being explored in relation to the actual provision of international humanitarian assistance is the control of foreign personnel. As spelt out in a wide variety of instruments, including the authoritative, though not legally binding, IDRL Guidelines, ILC Draft Articles (art. 10) and, implicitly, UNGA Resolution 46/182, the affected States have the primary role and right to monitor all those people that are allowed to access their territories and to watch over their activities, in line with the principle of sovereign authority. The first and foremost tool at the disposal of affected States to control the entry of personnel is the requirement of consent that serves as a first filter. However, with the increasing presence of new international actors, including an increasing number of NGOs and other private entities, States borders have become more and more “porous”: as Silingardi points out, many NGOs do not usually arrive on the site of the disaster following an offer of assistance and the subsequent consent on the part of the affected State, but they simply reach the hit territories and only once they have already entered States borders they stipulate formal agreement with State authorities¹⁷⁶. As a consequence, the only possible way to control the entrance of these people, but also to monitor humanitarian assistance providers in general, and oversee their activities lies in the issuance of visas, regulation of custom duties, and imposition of standards and guidelines for carrying out operations. However, it can be said that there is a dilemma present here: on the one hand there is the need to speed up or even eliminate lengthy procedures regarding the entry and operation of humanitarian actors with the aim of ensuring timely and quick response in case of disasters that exceeds national capacities, but on the other hand there is also the need to guarantee that international actors respect domestic and international laws, standards and codes of conduct in order to avert abuses.

3.3.1. Entry of emergency relief personnel in the territory of the affected States.

Concerning entry procedures, which basically have to do with the issuance of visas, the tendency is to urge affected states to accelerate them, or provide for waivers and/or ad hoc measures in case

¹⁷⁶ Silingardi S. (2012) ‘The Status of Emergency Workers’ in de Guttry et al. (eds.) *International Disaster Response Law*. 1st edn. The Hague: T.M.C. Asser Press, pp.479-479.

of emergency because the first and foremost mission to carry out is to rescue and supply humanitarian aid to affected populations promptly. Provisions regarding the entry in States' territories hit by disasters are contained in several international binding treaties that have specific fields of application: the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (art.8,9), the Convention on the Transboundary Effects of Industrial Accidents (Annex X), the International Convention on Oil Pollution Preparedness, Response and Cooperation (art.7), the Framework Convention on Civil Defence Assistance (art.4), and the Tampere Convention (art.9). The problem with these treaties is that either they are issue-specific, thing that complicates the situation in presence of complex disasters (e.g. a natural event that triggers nuclear emergencies and other industrial accidents), or also in case of disasters of single nature they deal with different aspects of humanitarian assistance; second, some of them have a limited number of ratifications. To cope with these shortcomings, the legal framework is supplemented by several regional instruments, and a wide set of bilateral agreements that, generally speaking, provide for the minimization and facilitation of entry formalities or their exemption. However, as Silingardi underlines, there is another important problem that remains: apart from geographical or situational limitations, all these treaties discipline State-to-State and/or State-to-IOs relations, thus failing to reflect the tendency of the last decades where NGOs and private actors in general took the lead in disaster relief operations¹⁷⁷. This legal vacuum is, in part, filled by the presence of non-binding instruments that tackle the issue of entry, transit, movements and stay of a wider range of humanitarian actors. Among them are the UNGA Resolution 57/150 of 2002¹⁷⁸, dealing with search and rescue activities, and the Draft Articles on the Protection of Persons in the Event of Disasters (art.8, art.15). Yet, the most relevant soft law instruments that regulate these aspects are the IDRL Guidelines and Model Act, whose importance has also been stressed by the UNGA in three different Resolutions¹⁷⁹. They provide useful guidance with the purpose of helping interested States to improve and strengthen their domestic legal and institutional framework in the field of disaster response and disaster risk reduction. With specific reference to humanitarian personnel entry, the IDRL guidelines provide that

¹⁷⁷ Ibid., p.560.

¹⁷⁸ See UNGA (2202). Strengthening the effectiveness and coordination of international urban search and rescue assistance, A/RES/57/150.

¹⁷⁹ References are included in UNGA Resolutions 63/137 of 11th December 2008, 63/139 of 11th December 2008, 63/141 of 11th December 2008 and 64/251 of 22nd January 2010.

with regard to disaster relief and initial recovery personnel of assisting States and eligible assisting humanitarian organizations, affected States should: (a) Grant visas and any necessary work permits, ideally without cost, renewable within their territory, for the time necessary to carry out disaster relief or initial recovery activities; (b) In disaster relief operations, waive or significantly expedite the provision of such visas and work permits¹⁸⁰.

The urgency to define clear rules for the establishment of comprehensive and possibly uniform domestic frameworks for the facilitation of procedures, particularly for the issuance of visas, is stressed by past experiences. It has happened several times, like in the aftermath of the 2004 tsunami in Indonesia and Thailand, that relief operators were forced to exit and then enter again the affected territories because they were granted temporary tourist visas instead of ad hoc ones. This is a situations that could result in even more harmful and dramatic consequences in case of technological and man-made disasters, like nuclear accidents. This is due to the fact that highly qualified personnel and expert teams that can arrive on site to engage in the devise of plans and operations for the reduction of radioactive dispersion cannot easily be substituted when tourist visas expire and an interruption, even temporary, of activities for such a trivial problem caused by the lack of appropriate legal provisions, can of course lead to a worsening of the crisis.

3.3.2. Privileges and immunities for emergency relief personnel.

As well as the entry and stay of relief personnel, it is essential to define operational issues, for which the underlying establishment of privileges and immunities is paramount. Here again there is a sort of conflict of interest: on the one hand, humanitarian personnel needs privileges and immunities in order to carry out their functions efficiently, while on the other hand there is the need to shield the affected population from abuses, carelessness, and unqualified or unprepared personnel. Privileges and immunities are necessary in order to grant some “freedom of movement” in unfamiliar legal systems. Indeed, as Fisher underlines, international humanitarian actors, in the absence of established privileges and immunities, may fear to be found guilty of civil and/or even criminal offences simply because of a lack of knowledge of the legal system in which they are asked to

¹⁸⁰ IFRC. (2007). *Guidelines for the Domestic Facilitation and Regulation of International Disaster Relief and Initial Recovery Assistance*, International Federation of the Red Cross and Red Crescent Societies: Geneva, Part V, Section 16.

operate and this can create constraints for their freedom of action¹⁸¹. Frequent civil litigations deal with the violation of laws on employment that either are not known or they are breached intentionally but in good faith, out of the necessity to act quickly. Another example regards medical practices: doctors and nurses may need to violate medical operational protocols to help as many people as possible.

As far as the treaties that provide for the attribution of privileges and immunities and their boundaries are concerned, there are relevant examples at all levels of application: international, regional and bilateral. Focusing the attention on the international level, it is possible to make a distinction between treaties that pertain specifically to IDRL, and convention that pertain to general international law. The former category comprises, for instance, the Nuclear Assistance Convention, the Tampere Convention, and the Framework Convention on Civil Defence Assistance. These examples are illustrative of the difference of detailedness with which the issue can be tackled: the Nuclear Assistance Convention and the Tampere convention explain with considerable preciseness who is entitled to receive privileges and immunities, their content and extension¹⁸² (their extension is similar to that granted to consular officers); on the other hand, the Framework Convention on Civil Defence Assistance only provides that “the Beneficiary State shall, within the framework of national law, grant all privileges, immunities, and facilities necessary for carrying out the assistance and shall provide protection for personnel and for property belonging to the Civil Defence Unit of the Supporting State”¹⁸³. This is again evidence of the great fragmentation and diversification of IDRL. With regard to general international law instruments, they are relevant to identify the privileges and immunities conceded to the UN (Convention on the Privileges and Immunities of the United Nations, and Convention on the Safety of the United Nations and its Associated personnel, as broadened by the Optional Protocol of 2005; the latter is relevant also because it contains the responsibility on the part of the receiving State to guarantee the safety of the UN personnel deployed in the operations), UN specialized agencies (Convention on the Privileges and Immunities of the Specialized Agencies), and the International Atomic Energy Agency (Convention on the Privileges and Immunities of the International Atomic Energy Agency); these conventions also contain important provisions regarding visas, customs exemption and other regulatory issues that

¹⁸¹ Fisher D. (2007). ‘The Law of International Disaster Response: overview and ramifications for military actors’ in Carsten M. D. (ed.) *Global legal challenges: command of the commons, strategic communication, and natural disasters*. Newport, RI: Naval War College, p.304.

¹⁸² See Convention on Assistance in the Case of a Nuclear Accident or Radiological emergency, Article 8; Tampere Convention on the Provision of Telecommunication Resources for Disaster Mitigation and Relief Operations, Article 5

¹⁸³ Framework Convention on Civil Defence Assistance, Article 4(a)(5).

are fundamental for a timely and coordinated supply of humanitarian assistance. All other IOs might receive privileges and immunities only insofar as relevant IDRL treaties (e.g. those mentioned above) so provide, while privileges and immunities for the IFRC are accorded mainly through bilateral status agreements. Finally, as far as NGOs and their personnel are concerned, they are not generally entitled to be granted privileges and immunities. However, in the field of IDRL some treaty provisions on the matter have been interpreted in such a way to comprise also NGOs; an example is the Tampere Convention because it refers in a general way to persons, other than nationals, and foreign organizations without making reference to their nature, thus practically granting NGOs personnel privileges and immunities comparable to those enjoyed by the UN; however, it should be recalled that the Tampere convention has a limited and specific field of application¹⁸⁴. A similar approach is taken, at the regional level, by the ASEAN Agreement on Disaster Management and Emergency Response, and Inter-American Convention to Facilitate Disaster Assistance.

3.3.3. The Status of military personnel in the context of disaster relief operations.

Separate considerations must be devoted to the issue of military personnel employed in the context of disaster relief. This is important because militaries are more and more involved also in peace situations, like emergency response in the aftermath of a disaster, where their preparation, qualification, training and expertise is fundamental. This is especially true in the face of complex technological disasters that require the performance of specific, difficult, and highly dangerous tasks that necessitate particular competences. However, the employment of military personnel is not without obstacles that regard, in particular, the specification of the legal status within the borders of the receiving/affected State, concerns concerning their neutrality, impartiality and non-interference, and the related fear of an increasing “militarization” of humanitarian assistance¹⁸⁵. First of all, it must be recalled that, as stated in several UNGA Resolutions, including the landmark Declaration on Friendly Relations, as well as in the ICJ Case Concerning Military And Paramilitary Activities In And Against Nicaragua (Nicaragua v. United States of America)¹⁸⁶, military troops cannot

¹⁸⁴ Fisher D. (2007). ‘The Law of International Disaster Response: overview and ramifications for military actors’ in Carsten M. D. (ed.) *Global legal challenges: command of the commons, strategic communication, and natural disasters*. Newport, RI: Naval War College, p.297.

¹⁸⁵ *Ibid.*, p.294.

¹⁸⁶ See, UNGA (1970). Declaration on Principles of International Law Friendly Relations and Co-operation among States in accordance with the Charter of the United Nations (A/RES/25/2625), third Principle; and ICJ (1986). *Case concerning military and paramilitary activities in and against Nicaragua* (Merits), paras. 202-203.

be deployed in foreign territories in the absence of a valid justification; in the case of disasters, the consent of the affected State must be present in order for foreign militaries to provide assistance in relief operations, otherwise the intervention is unlawful because in breach of the principle of non-intervention and to a certain extent even of the prohibition of the use of force.

Considering the international level, the most important instrument on the matter are the Oslo Guidelines on the Use of Foreign Military And Civil Defence Assets in Disaster Relief which apply to natural as well as man-made technological disasters. It defines principles and operational standards regulating the activities of both UN Military and Civil Defense Assets (MCDA) and other MCDA coming from single assisting states, as well as the tasks and responsibilities of affected states, assisting states, transit states and relevant UN Agencies and figures (e.g. Resident Coordinator/Humanitarian Coordinator, OCHA, ERC and IASC), with specific mention also to the relevant measures that have to be put in place in order to facilitate the entry and activities¹⁸⁷.

One of the most important things to consider in relation to the employment of military personnel in the realm of disaster relief and assistance is the status of the personnel and, specifically, the presence of privileges and immunities granted to foreign troops by the affected state. Unfortunately, the rules and norms applicable are not straightforward and comprehensive since they can be derived from diverse branches of international law and instruments of different nature (multilateral treaties, bilateral ones and customary law) and, most importantly, the status of foreign military personnel employed abroad varies according to the nature of the mission and the operational context (e.g. in peace or war times), so what is valid in conflict situations cannot be automatically translated in the context of disaster relief¹⁸⁸; however, it is possible to outline an overall legal regulatory framework¹⁸⁹.

In general terms, it is relevant to recall that in presence of nationals on the territory of a foreign state, there might be a case of concurrent jurisdiction: the receiving State can assert its prescriptive jurisdiction based on the principle of territoriality, while the sending State can rely on an extra-territorial application grounded on the nationality, passive personality principle or more generally on the principle established by the PCIJ in the groundbreaking Lotus Case which provides that

¹⁸⁷ Oslo Guidelines on the Use of Foreign Military and Civil Defence Assets in Disaster Relief (Revision 1.1 November 2007).

¹⁸⁸ Sari A. (2015). 'The Status of armed forces in public international law: jurisdiction and immunity' in Orakhelashvili A. (ed.) *Research Handbook on Jurisdiction and Immunity in International Law*. Cheltenham, UK: Edward Elgar Pub., p.3.

¹⁸⁹ *Ibid.*, pp- 1-2.

It does not, however, follow that international law prohibits a State from exercising jurisdiction in its own territory, in respect of any case which relates to acts which have taken place abroad, and in which it cannot rely on some permissive rule of international law. Such a view would only be tenable if international law contained a general prohibition to States to extend the application of their laws and the jurisdiction of their courts to persons, property and acts 'outside their territory, and if, as an exception to this general prohibition, it allowed States to do so in certain specific cases. But this is certainly not the case under international law as it stands at present. Far from laying down a general prohibition to the effect that states may not extend the application of their laws and the jurisdiction of their courts to persons, property and acts outside their territory, it leaves them in this respect a wide measure of discretion which is only limited in certain cases by prohibitive rules [...] ¹⁹⁰.

On the other hand, the enforcement jurisdiction establishes that, “failing the existence of a permissive rule to the contrary, [the State] may not exercise its power in any form in the territory of another State. In this sense jurisdiction is certainly territorial”¹⁹¹. However, the possibility for States to exercise jurisdiction in a specific instance is also determined by the presence of other applicable rules of IL. In the case of military personnel on foreign soil, the first applicable rules to consider are those on privileges and immunities, since they are State organs for all intent and purpose¹⁹². As a consequence, military personnel enjoy immunity *ratione materiae*, for acts committed in their official capacity. It has also to be added that the immunity of State officials and organs has long acquired the status of customary international law. Immunities are procedural bars to jurisdiction which means that a court of a State is not competent to adjudicate cases in which state officials are involved and to whom immunity is granted. It is neither a case of impunity since they can be adjudicated by domestic courts or, in extreme cases, by international tribunals (e.g. ICC, if the requirements are met), but it means that these officials must be granted a special status for the performance of their duties; nor is it a case of non-justiciability because non-justiciability pertains to the substance of the case and it essentially asserts that the subject matter of the claim fall outside the competence of national courts of other States.

However, immunities of military forces are regulated also by specific rules that complement general norms of IL on privileges and immunities. Special mention has to be made to the so-called SOFA,

¹⁹⁰ PCIJ (1927). *S.S. Lotus (France v. Turkey)*, para.46. Available at: http://www.worldcourts.com/pcij/eng/decisions/1927.09.07_lotus.htm (accessed: 20 December 2020)

¹⁹¹ *Ibid.*, para. 45.

¹⁹² Voetelink J. (2015). *Status of Forces: Criminal Jurisdiction over Military Personnel Abroad*. The Hague: T.M.C. Asser Press, p.152.

Status of Forces Agreements. Mason describes them as agreements that “establish the framework under which [...]military personnel operate in a foreign country”¹⁹³ and they have the primary function to clarify issues related to the exercise of jurisdiction on foreign military forces and, generally speaking, they confirm the concession of privileges and immunities from the jurisdiction of the receiving State, acting as a barrier to civil and criminal proceedings.

Turning to non-binding provisions, the above mentioned Oslo Guidelines are fundamental. Regarding UN MCDA, they stipulate that “on the basis of Article 105 of the Charter of the United Nations, individual UN MCDA personnel, alerted, mobilized and deployed at the request of OCHA may be granted the status of experts on mission for the United Nations according to article VI of the Convention on the Privileges and Immunities of the United Nations”¹⁹⁴, whereas “most foreign MCDA deployed in a natural disaster will be deployed based on bilateral agreements or multilateral treaties. These agreements should address the status of forces deployed on relief operations”¹⁹⁵. These agreements include of course SOFAs.

It stands to reason that the granting of privileges and immunities is anyway always accompanied by the obligation to respect the laws of the receiving State, as provided by both instruments of general IL, and instruments in the field of IDRL. Connected to this, it should be recalled that receiving States always possess the right to declare a person enjoying privileges and immunities a *persona non grata*.

3.3.4. The importance of goods and equipment admission and recognition of professional qualifications for the operations and activities of relief personnel.

As a last point, it is worth referring briefly to the fact that the activities and actions of relief personnel are not only made complex by the issue of entry visas and the grant of privileges and immunities, but also because of complications related to the admission of goods and equipment in the territory of the affected State and the recognition of professional qualification, the lack of which constitute an important barrier to prompt and effective operations. The presence of custom procedure and custom duties is particularly relevant because the presence of lengthy mechanisms can be very detrimental in presence of perishable goods or commodities that need specific conservation methods, like medicines, as well as for the simple reason that they slow operations

¹⁹³ Mason R. C. (2012). *Status of Forces Agreement (SOFA): what is it and how has it been utilized?*, Congressional Research Service. Available at: <https://fas.org/sgp/crs/natsec/RL34531.pdf> (accessed: 21 December 2020)

¹⁹⁴ Oslo Guidelines on the Use of Foreign Military and Civil Defence Assets in Disaster Relief, para. 30.

¹⁹⁵ *Ibid.*, para.31.

down and they can be costly, thus constituting a waste of money that could instead be allocated for more urgent matters. Together with the issuance of, or exemption from entry visas for relief personnel, this is one of the topics that is more widely tackled in IDRL instruments; they generally call for the exemption from normal custom duties and restrictions. However, the presence of different instruments, both binding and non-binding (e.g. IDRL Guidelines and ILC Draft Articles art.15), with diverse levels of application, degree of specificity, and areas of application¹⁹⁶, gives rise to a fragmented and often incongruent legal framework that has often resulted in delays and difficulties because it is hard to define clear and all-encompassing obligations for States¹⁹⁷.

On the other hand, the issue of the recognition of professional qualification, that are required for some professional figures, for instance pilots and medical personnel, that is equally important to take action promptly, is only included in few instruments that fall in the realm of IDRL¹⁹⁸. Otherwise, systems and mechanism for the recognition of qualifications obtained abroad are contained in agreements that fall outside the context of disaster relief, but in this case important aspects and needs that are essential in emergency situations specifically are missing.

As noted above for the case of visas and privileges and immunities, the main obstacle is the dilemma between the will to keep control over the flow of goods, equipment and personnel that enter the affected country, and the paramount need to expedite relief operations. Affected countries want to be sure that goods and commodities respect national regulations and standards of quality and safety (requirement that is particularly important in the case of medicines and medical equipment), but at the same they feel the pressure to authorize the access in order to relieve people's sufferings as quickly as possible. The same applies to professional figures and their qualifications: their expertise is immediately needed but at the same time there is the necessity to guarantee that they are sufficiently qualified or even that they are not profiteers. It can be said that this is a dilemma that can only be partially solved through the establishment of detailed domestic legal frameworks for disaster preparedness and response, based on, and following the establishment of, international comprehensive, widely-applied and particularized agreements and guidelines. This is imperative in order to overcome the present inconsistencies, overlaps, gaps and fragmented nature that characterize the field of disaster prevention and response that are nothing but jeopardizing the

¹⁹⁶ See Adinolfi G. (2012). 'Customs Obstacles to Relief Consignments Under International Disaster Response', in de Guttery et al. (eds.) *International Disaster Response Law*. 1st edn. The Hague: T.M.C. Asser Press, pp. 533-550.

¹⁹⁷ Fisher D. (2007). 'Domestic regulation of international humanitarian relief in disasters and armed conflicts: a comparative analysis', in *International Review of the Red Cross*, Vol. 89, No. 866, pp. 357-358.

¹⁹⁸ Silingardi S. (2012). 'The Status of Emergency Workers' in de Guttery et al. (eds.) *International Disaster Response Law*. 1st edn. The Hague: T.M.C. Asser Press, p.566.

fulfillment of the basic and primary IDRL goal: preventing and minimizing people's sufferings in the event of natural and man-made disasters by guaranteeing, or immediately restoring, the full respect, protection and fulfillment of human rights and satisfaction of fundamental needs.

Chapter 2

International Nuclear Law as part of IDRL: binding treaties for the prevention of - and minimization of the risks associated with - nuclear emergencies.

1. Introduction to the principles underlying the development of International Nuclear Law and its connection to IDRL

As already anticipated in the opening to Chapter 1, the production of nuclear energy for peaceful uses is considered as an ultrahazardous activity since it poses very high risks to the safety, wellbeing and health of people, and to the environment. Because of the dangers and consequences connected to the release of radiations on both human beings and the environment, nuclear accidents, but also all those activities that turn around the production of nuclear energy, being ultrahazardous practices which can potentially lead to problematic events, fall in the realm of IDRL for all intents and purposes. For this reason, all that has been described in the previous chapter apply to nuclear energy production, from prevention, to disaster risk reduction, cooperation, and management of disaster situations. However, because of the peculiarities of the nuclear sector that is very technical and highly specialized, and the specific risks and consequences linked to radioactivity that distinguish nuclear accidents from all other forms of emergencies, a comprehensive and punctual institutional and legal framework has emerged, with the purpose of defining common practices, standards and principles. So, today, it is possible to argue that an international regime in its own right is in place: International Nuclear Law (INL) that, for the aforementioned reasons, can be considered, at least partially, as a branch of IDRL.

International Nuclear Law can be defined as “body of special legal norms created in order to regulate and control the conduct of persons engaged in activities related to fissionable material and other material emitting ionizing radiation”¹⁹⁹. Thus, the main objective of INL is to yield an effective legal framework aiming at regulating all activities associated with the production atomic energy, with a view to prevent, or minimize the likelihood of nuclear accidents or radiation leaks and, consequently, to protect people, the environment and properties²⁰⁰. In the development of INL, especially concerning the drafting of binding conventions, the Chernobyl nuclear accident of 1986

¹⁹⁹ Reyners P. (2013). *Introduction to Nuclear law – Nuclear Law in 8 questions*. Available at: <http://indico.ictp.it/event/a12196/session/79/contribution/54/material/0/0.pdf> (accessed: 27 December 2020)

²⁰⁰ Ibid.

played a key role. The disaster raised public awareness about the risks implicit in the production of nuclear energy and the catastrophic impacts of radiations on human bodies (bringing the images of Hiroshima and Nagasaki back to memory), and on the environment where affects are not immediately appreciable but equally upsetting. In addition, the accident clearly showed the possible transboundary nature of nuclear accidents: Chernobyl made clear that nuclear accidents are not a concern for the single state where they occur but their effects can expand thousands of kilometers away²⁰¹. As a consequence, it triggered a process of revision of already present treaties and especially of adoption of new binding instruments for the creation of an international well-structured system and network based on mutual cooperation in the contexts of nuclear security and safety, preparedness and response, and liability, with the primary aim to cope effectively with an increasing internationalization of nuclear energy and its impact²⁰².

INL focuses on the temporal dimension of the production of atomic energy from a double perspective: on the one hand, in accordance with IDRL, it tackles all the different phases of the disaster cycle; on the other hand, it considers the entire nuclear fuel cycle, thus taking into account “the series of industrial processes which involve the production of electricity from uranium in nuclear power reactors”²⁰³. Obviously, there is also a spatial dimension that has to do with the internationalization of nuclear energy production and its possible detrimental effects. The spatial dimension as well can have a twofold conceptualization: it refers to the possible transboundary impacts of accident, but also the fact that the different phases of the nuclear fuel cycle very often involve more than one country (e.g. the transport and storage of spent fuel in countries different from the one where the actual production of nuclear energy took place) for which clear responsibilities have to be established. It is exactly the broad spatial dimension turning around atomic energy and the extreme risks associated to it that called for the establishment of a clear and comprehensive legal framework.

One point is worth being stressed: the legal framework related to nuclear energy regulates activities, it does not prohibit them; it is clear that nuclear energy involves significant risks in terms of safety and health but at the same time its benefits in the field of industrial development and of electricity production are widely acknowledged. Thus, the main challenge for INL is to regulate the production

²⁰¹ Gioia A. (2012). ‘Nuclear Accidents and International Law’, in de Guttry et al. (eds.) *International Disaster Response Law*. 1st edn. The Hague: T.M.C. Asser Press, p. 86.

²⁰² Ibid.

²⁰³ World Nuclear Association. (2020). *Nuclear fuel cycle overview*. Available at: <https://www.world-nuclear.org/information-library/nuclear-fuel-cycle/introduction/nuclear-fuel-cycle-overview.aspx> (accessed: 28 December 2020)

of nuclear energy trying to find an optimal balance between risks and benefits; a sub-optimal organization, biased in favor of one pole or the other will either unnecessarily jeopardize the safety and health of individuals and the environment or make the potential of nuclear energy rather irrelevant²⁰⁴.

INL is based on eleven fundamental principles whose fulfillment is achieved and guaranteed through the implementation and respect of international binding treaties, customs and even soft law instruments. As listed by the IAEA, they are the safety principle, security principle, responsibility principle, permission principle, continuous control principle, compensation principle, sustainable development principle, the compliance principle, independence principle, transparency principle, and international co-operation principle²⁰⁵. The safety principle, security principle, responsibility principle and compensation principle will be analyzed more in depth in the following sections together with the international conventions in the field of INL that aim at practically realizing those specific principles. Specific attention, instead, should be devoted here to four principles, as a matter of introduction to aspects that will be dealt in the next chapters.

1. Sustainable development principle: sustainable development, according to the Brundtland Commission, refers to “meeting the needs of the present generations without compromising the ability of future generations to meet their own needs”²⁰⁶. This concept is particularly relevant in the field of nuclear energy because radioactive materials employed in its production pose high risks not only to present but also to future generations, since radioactivity decreases only in the very long run. Exactly because of the long life of radioactive materials, it is also hard to determine what type of measures have to be put in place presently in order to minimize adverse effects for future generations. For this reason, the approach applied today is that today’s generations do whatever it takes and it is in today’s possibilities to ensure safety also in the long run²⁰⁷. As a consequence, the development of a strong and punctual legal framework for the prevention and minimization of radioactive risks is essential not only for the protection of today’s people and environment but also for future generations.
2. Independence principle: it refers to the nature of domestic regulatory authorities that must watch over the activities connected to nuclear energy production, especially

²⁰⁴ IAEA. (2003). *Handbook on nuclear Law*. Vienna: IAEA, p.3.

²⁰⁵ *Ibid.*, pp. 5-10

²⁰⁶ EUR-Lex (n.d.). *Glossary of summaries – sustainable development*. Available at: https://eur-lex.europa.eu/summary/glossary/sustainable_development.html (accessed: 16 May 2021).

²⁰⁷ IAEA. (2003). *Handbook on nuclear Law*. Vienna: IAEA, p.8-9.

regarding safety matters. These authorities have to be independent from any other entity engaged in promoting and developing the production of nuclear energy in order to avoid dangerous conflicts of interests²⁰⁸. This principle will be particularly important for the analysis of the Japanese management of the nuclear compartment and state responsibilities in the case of the Fukushima accident of 2011.

3. Transparency principle: it is strictly linked to the public participation principle that is also customary law. This principle emerges from the fact that nuclear energy has been utilized for a very long time as part of military programmes, so information on nuclear development was kept confidential as a matter of national security. However, with the increasing application of nuclear technologies for peaceful utilization, transparency was made necessary in order to build public confidence but, at the same time, all relevant information regarding the use and development of nuclear energy, radiations leaks, accidents and any other meaningful occurrence must be made public because it can affect the safety, health and life of individuals and the integrity of the environment²⁰⁹.
4. International Co-operation principle: international cooperation is at the basis of disaster management and prevention, as already described. In the field of nuclear energy, cooperation for the minimization of the risk of accidents and their possible consequences takes different forms: the development of common networks and systems necessary to face the probable transboundary impact of nuclear emergencies and to manage the internationalization of nuclear energy, the sharing of lessons learned that can be useful to improve practices and safety, and collaboration in the context of nuclear security that is essential to ensure that nuclear materials are not subtracted and diverted to illicit uses²¹⁰. This is the principle but also the objective behind all conventions that will be analyzed in the following sections.

Finally, before analyzing the main binding instruments that regulate the development and use of nuclear energy, it is necessary to introduce the role and functions of the main international organization in the field: the International Atomic Energy Agency (IAEA). It was officially established in 1957 but its inception can be traced back to 1953 when, President Eisenhower addressed his “Atoms for peace” speech to the UNGA on 8 December. The idea behind Eisenhower’s speech was that it was possible “to move out of the dark chamber of horrors into the light, to find a way by

²⁰⁸ Ibid., p.9.

²⁰⁹ Ibid., p.10.

²¹⁰ Ibid., 10-11.

which the minds of men, the hopes of men, the souls of men everywhere, can move forward towards peace and happiness and well-being”²¹¹: through international cooperation, nuclear energy could become the source of positive progress and development, instead of threat, grief and scary military competition. From this acknowledgement, the IAEA was created with a clear objective:

[t]he Agency shall seek to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world. It shall ensure, so far as it is able, that assistance provided by it or at its request or under its supervision or control is not used in such a way as to further any military purpose²¹².

With this objective in mind, the IAEA was entrusted a series of functions with the purpose of giving practical application to this fundamental objective. These functions, listed in Article III of the Statute, are all grounded on a deep sense of cooperation and collaboration among member states and between the Agency and its members²¹³. However, the role and tasks entrusted to the IAEA were further specified and also expanded as a consequence of the conclusion of new binding treaties, under its auspices, as the following pages will describe.

2. Nuclear Safety: the Convention on Nuclear Safety and the Joint Convention on the Safety of Spent Fuel Management and of the Safety of Radioactive Waste Management.

The Convention on Nuclear Safety and the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management are the two main conventions directed at the fulfillment of the safety principle. The definition of nuclear safety provided by the IAEA is the following: “the achievement of proper operating conditions, prevention of accidents or mitigation of accident consequences, resulting in protection of site personnel, the public and the environment from undue radiation hazards”²¹⁴. From this definition, it is possible to draw some sub-principles; the first one is the prevention principle which provides that, due to the risks and dangers entailed in the production of nuclear energy, primary attention should be devoted to the promotion

²¹¹ IAEA. (n.d.). *Atoms for peace speech*. Available at: <https://www.iaea.org/about/history/atoms-for-peace-speech>. (accessed: 29 December 2020).

²¹² IAEA. (1989). Statute of the IAEA, Article II.

²¹³ *Ibid.*, Article III.

²¹⁴ Pelzer N. (2006). ‘Learning the hard way: did the lessons taught by the Chernobyl nuclear accident contribute to improving nuclear law?’, in IAEA-NEA, *International nuclear law in the post-Chernobyl period*, p.86.

of prudence and attentiveness that are necessary elements to prevent or minimize harm. In addition, due to the persisting uncertainties related to the effects of low doses of radiations on human bodies and on the environment, it can be said that there is not only the need to respect a prevention principle, but there are also valid grounds to talk about the relevance of the precautionary principle; a second one is the protection principle which refers to the essential goal of INL to balance dangers and benefits; however, it underlines that when the dangers connected with a specific activity are thought to exceed benefits, primary concern must be devoted to the preservation of people's health and well-being and to the protection of the environment.

2.1. The 1994 Convention on Nuclear Safety

Even before the Chernobyl disaster, discourses on the need to put forward a common and comprehensively acceptable approach to nuclear safety had already emerged, even though it was generally accepted that “the prime and ultimate responsibility for nuclear safety rests with the sovereign State having jurisdiction over the nuclear installation”²¹⁵; in the words of the director of the nuclear safety division of the IAEA, back in 1983,

National approaches to nuclear safety developed over the years have resulted not only in differences in regulations, but also in variations in technical requirements from one country to another. This has been a burden for the international nuclear market, and it has possibly had an effect on the level of public confidence. The development of a clear and universally acceptable approach to safety guided by an international body composed of prominent experts might well alleviate national and international safety concerns, and might also positively influence public opinion²¹⁶.

The reluctance towards the possibility of creating international obligations in the field of nuclear safety was linked to the fact that energy production has always been considered as a key issue for states' sovereignty. Indeed, energy production and specifically nuclear power “is often both an important part of the national power supply and evidence of high technical and scientific

²¹⁵ Jankowitsch-Prevor, O. (2003) quoted in Wright T. (2007). ‘The ‘incentive’ concept as developed in the nuclear safety convention and its possible extension to other sectors’, in *Nuclear Law Bulletin*, Vol.2007/2, p.29.

²¹⁶ Rosen M. (1983). ‘Establishment of a nuclear safety body’, in *IAEA Bulletin*, Vol. 25, No.3.

qualification and capability; interference in its operation is not just a matter of national security, but of energy independence and policy, economic policy and national pride”²¹⁷.

The Chernobyl accident was a game changer and increased the pressure on the IAEA and States to take steps in order to devise a common safety programme and standards. This was deemed necessary first to try to prevent or minimize the effects of another accidents like that of Chernobyl, and second to try to regain the confidence of the public opinion regarding the safety of nuclear installations. Opposition against binding standards by some nuclear States like the US and France was overcome thanks to the first reports that were published on the consequences of radiation exposure on individuals and the safety deficiencies that affected RBMK types of reactors that upset especially European States, and the consolidation in International Environmental Law of principles, also of a customary nature, regarding the transboundary impact of accidents²¹⁸. Therefore, a considerable number of States agreed to start drafting a binding convention on nuclear safety instead of relying on codes of conduct and guidelines; however, disagreement on the content of the convention did not disappear during the negotiations. Because of disagreements and of sharp differences in domestic practices and interests, the convention on Nuclear Safety, adopted in 1994 and entered into force two years later, belong to the family of the so-called framework conventions. Indeed, it contains rather general provisions and principle, instead of very specific technical requirements that can anyway be the subject of protocols²¹⁹.

It is important to look at the preamble of the Convention in order to understand the drafters’ priorities, hopes and necessities. It stresses the awareness about “the importance to the international community of ensuring that the use of nuclear energy is safe, well-regulated and environmentally sound”²²⁰ and about the possible transboundary impacts of nuclear accidents; for this reason, the need to keep promoting the maximum level possible of nuclear safety in the whole world and a strong safety culture through constructive and sound international cooperation is essential²²¹. Another important reference contained in the preamble regards responsibility: it is stated that “responsibility for nuclear safety rests with the State having jurisdiction over a nuclear installation”²²². All this remarks are then reflected in the substantive parts of the Convention.

²¹⁷ Wright T. (2007). ‘The ‘incentive’ concept as developed in the nuclear safety convention and its possible extension to other sectors’, in *Nuclear Law Bulletin*, Vol.2007/2, p.30.

²¹⁸ De la Fayette L. (1993). ‘International Environmental Law and the problem of nuclear safety’, in *Journal of Environmental Law*, vol.5, No.1, pp. 36-39.

²¹⁹ *Ibid.*, p.40.

²²⁰ Convention on Nuclear Safety (1994), Preamble (i).

²²¹ *Ibid.*, Preamble (ii), (iv), (v), (vii).

²²² *Ibid.*, Preamble (iii).

Chapter 1 of the Convention deals with objectives, definitions and scope of application. The objectives, described in Article 1, of course concern the achievement and maintenance of a high degree of nuclear safety in order to prevent or minimize the consequences of nuclear accidents. The most interesting thing to note, however, regards the scope of application; Article 3 states that the Convention “shall apply to the safety of nuclear installations”²²³ but, looking at Article 2 (“definitions”) where what is meant by nuclear installation is clarified, it is possible to read that

“nuclear installation” means for each Contracting Party any land-based civil nuclear power plant under its jurisdiction including such storage, handling and treatment facilities for radioactive materials as are on the same site and are directly related to the operation of the nuclear power plant. Such a plant ceases to be a nuclear installation when all nuclear fuel elements have been removed permanently from the reactor core and have been stored safely in accordance with approved procedures, and a decommissioning programme has been agreed to by the regulatory body²²⁴.

In light of this definition, it is possible to state that the Convention has a rather narrow scope of application because it only addresses the safety of nuclear reactors, not of all nuclear activities and, in addition, only a specific set of nuclear installation: civil land-based power plants.

Chapter 2 of the convention contains the most important provisions for the actual development and maintenance of nuclear safety, namely those concerning contracting states’ obligations. Article 4 provides that “each Contracting Party shall take, within the framework of its national law, the legislative, regulatory and administrative measures and other steps necessary for implementing its obligations under this Convention”²²⁵ and the content of necessary steps to undertake are further specified in Article 7 and 8. Article 7 states that contracting parties shall develop a legislative and regulatory framework to guarantee the safety of nuclear installations that, among other things, is entrusted with the enactment of domestic safety requirements and regulations, a well-defined system for the release of licenses for nuclear installations falling within the scope of the convention, and with regular inspections and assessments to verify the compliance with safety requirements and regulations. Article 8, instead, deals with the establishment of an authoritative and competent regulatory body charged with the implementation and oversight of the respect of the legislative and

²²³ Ibid., Article 3.

²²⁴ Ibid., Article 2 (i)

²²⁵ Ibid., Article 4

regulatory framework; paragraph (2) further specify that it is mandatory “to ensure an effective separation between the functions of the regulatory body and those of any other body or organization concerned with the promotion or utilization of nuclear energy”²²⁶, in accordance with the independence principle. Finally, always concerning regulation and legislation, Article 9 refers to the fact that “Each Contracting Party shall ensure that prime responsibility for the safety of a nuclear installation rests with the holder of the relevant license and shall take the appropriate steps to ensure that each such license holder meets its responsibility”²²⁷; so, license holders must guarantee the safety of nuclear installation, but at the same time States hold the primary responsibility to watch over the respect of safety requirements and regulations since, internationally, it is the installations state that bears the responsibility for the safety of nuclear installations under its jurisdiction, also in accordance with principles of customary law that will be explored in depth in Chapter 3 when the responsibility of the State for the Chernobyl and Fukushima nuclear accidents will be analyzed.

Articles from 10 to 16 basically give substance to the call, contained in the preamble, for the development of a strong safety culture that can only be achieved by giving utmost attention and priority to nuclear safety (Article 10), allocating sufficient financial resources and investing on the human capital, routine education and training (Article 11), acknowledging the importance of human factors in the safety of nuclear installations (Article 12), and carrying out regular and punctual assessments and verification of the safety during the different phases of the life of a nuclear installation (construction, commissioning and operation) (Article 14). Article 16 contains provision concerning emergency preparedness. This topic is treated in much greater detail in the Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency. However, since emergency preparedness is part of the definition of nuclear safety, Article 16 provides for the development of “the appropriate steps to ensure that there are on-site and off-site emergency plans that are routinely tested for nuclear installations and cover the activities to be carried out in the event of an emergency”²²⁸, and that information about these emergency plans is adequately supplied to the population and the competent authorities in the neighboring countries (signaling the importance of cooperation) in order to minimize the impact of radiological emergencies by which they can be negatively affected (Article 16 (2)); very important is the content of Article 16 (3): under the influence of the

²²⁶ Ibid., Article 8 (2).

²²⁷ Ibid., Article 9.

²²⁸ Ibid., Article 16 (1).

consequences of the Chernobyl accident which dramatically showed the transboundary impacts of radiological emergencies, it states that

Contracting Parties which do not have a nuclear installation on their territory, insofar as they are likely to be affected in the event of a radiological emergency at a nuclear installation in the vicinity, shall take the appropriate steps for the preparation and testing of emergency plans for their territory that cover the activities to be carried out in the event of such an emergency²²⁹.

The subsequent articles, from 17 to 19, refer to specific and practical obligations regarding the safety of nuclear installation, and they refer to the “siting” (article 17), “design and construction” (article 18), and “operation” (article 19). Particularly relevant and worth of mention, in light of the previous discussions and with a view to what will follow in the next chapters, are the dispositions on the siting of installations. They acquire particular importance if we consider that the siting of nuclear facilities of whatever type is becoming more and more important because of climate change and the advent of increasingly extreme weather events that put facilities under great stress and increase the likelihood of accidents. Article 17 (i) provides for the evaluation of “all relevant site-related factors likely to affect the safety of such a facility during its operating lifetime”²³⁰, and to assess the possible impact of facilities, in terms of safety, on people, society and the environment (Article 17 (ii)), in accordance with the obligation to carry out impact assessments, reiterated in Article 14 (i), that has acquired the status of customary law. In addition Contracting parties have the obligation of “[...] consulting Contracting Parties in the vicinity of a proposed nuclear installation, insofar as they are likely to be affected by that installation”²³¹; moreover, said Contracting Parties, if they deem it necessary, can also request the installation State to provide necessary information, “in order to enable them to evaluate and make their own assessment of the likely safety impact on their own territory of the nuclear installation”²³².

Finally, Chapter 3 deals with the obligations related to the “meetings of the parties” that give substance to the incentive character of the Convention. Indeed, the Convention is supported by a system of peer review that serves as enforcement mechanism since the convention does not contain any reference to other dispute settlement or enforcement mechanisms. The expression “incentive convention” emerged in during the early phases of the negotiation process as a strategy to

²²⁹ Ibid., Article 16 (3).

²³⁰ Ibid., Article 17 (i).

²³¹ Ibid., Article 17 (iv).

²³² Ibid.

encourage treaty participation²³³ devising a mechanism of compliance that combines the attainment of the primary aim of the convention, namely to “promote a high level of nuclear safety worldwide”²³⁴, and the respect of the consensus about the fact that “responsibility for nuclear safety rests with the State having jurisdiction over a nuclear installation”²³⁵; otherwise, a system of inspections would not be acceptable by States that consider energy production a matter of state sovereignty and would consider it a breach of the principle of non-intervention in domestic affairs. However, the meaning of “incentive convention” and related issues will be explored with more detailedness in section 2.3.

2.2. The Joint Convention on the Safety of Spent Fuel Management and of the Safety of Radioactive Waste Management.

As Wright describes it, the Joint Convention on the Safety of Spent Fuel Management and of the Safety of Radioactive Waste Management can be seen as the “sister” of the Convention on Nuclear Safety since they are both “incentive conventions” and they have a common background and inception²³⁶: initially, States considered to develop a unique convention to regulate the safety of all nuclear activities but this undertaking proved too complicated and, in the end, a separate convention dealing with spent fuel and radioactive waste was developed. Negotiations lasted for more than two years. The main disagreements turned around the notion of spent fuel: some States deemed it a radioactive waste, so a non-reusable material, while others considered it a resource with a utility and that could be re-employed²³⁷; this difference was also mentioned in the preamble of the convention at paragraph (vii) which states that “[r]ecognizing that the definition of a fuel cycle policy rests with the State, some States considering spent fuel as a valuable resource that may be reprocessed, others electing to dispose of it”²³⁸. The deadlock caused by this disagreement was overcome thanks to the decision to divide the convention into two parts: one dealing with spent

²³³ Wright T. (2007). ‘The ‘incentive’ concept as developed in the nuclear safety convention and its possible extension to other sectors’, in *Nuclear Law Bulletin*, Vol.2007/2, p. 32.

²³⁴ See Convention on Nuclear Safety (1994), Preamble (i).

²³⁵ Ibid.

²³⁶ Wright T. (2007). ‘The ‘incentive’ concept as developed in the nuclear safety convention and its possible extension to other sectors’, in *Nuclear Law Bulletin*, Vol.2007/2, pp.29-47.

²³⁷ Ibid., p. 36.

²³⁸ Joint convention on the Safety of Spent Fuel Management and of the Safety of Radioactive Waste Management (1997). Preamble (vii).

fuel and the other dealing with radioactive waste; from this separation stems the name “joint convention”²³⁹.

The Convention was adopted in 1997 and entered into force in 2001. The preamble has some points in common with the Nuclear Safety Convention in that it restates the primary responsibility of the State to guarantee the safety, in this case of spent fuel and radioactive waste management (para vi), the need “to promote an effective safety culture worldwide”²⁴⁰, and the paramount importance of international cooperation to improve the safety of the management of spent fuel and radioactive waste (para ix). Some additional important points that were not mentioned in the preamble of the Nuclear Safety Convention are worth of consideration: first, paragraph (iv) stresses the importance of involving the public on matters related to the management of spent fuel and radioactive waste that, as stated above analyzing the transparency principle, is fundamental; second, at paragraph (xv), explicit reference is made to environmental protection and specifically to Chapter 22 of the Agenda 21 adopted at the Rio Conference of 1992, titled “safe and environmentally sound management of radioactive waste”.

The objectives, listed in Article 1, mirror those of Nuclear Safety Convention. As far as the scope of application is concerned, the Joint Convention is applicable to the safety of spent fuel management (Article 3 (1)) and safety of radioactive waste management (Article 3 (2)) but only when spent fuel and radioactive waste originate from civilian nuclear installations and operations. However, despite this specification about the civilian origin of spent fuel and radioactive waste, paragraph 3 of Article 3 hold that

[t]his Convention shall not apply to the safety of management of spent fuel or radioactive waste within military or defence programmes, unless declared as spent fuel or radioactive waste for the purposes of this Convention by the Contracting Party. However, this Convention shall apply to the safety of management of spent fuel and radioactive waste from military or defence programmes if and when such materials are transferred permanently to and managed within exclusively civilian programmes²⁴¹.

²³⁹ Pelzer N. (2006). ‘Learning the hard way: did the lessons taught by the Chernobyl nuclear accident contribute to improving nuclear law?’, in IAEA-NEA, in *International nuclear law in the post-Chernobyl period*, p. 91.

²⁴⁰ Joint convention on the Safety of Spent Fuel Management and of the Safety of Radioactive Waste Management (1997). Preamble (v).

²⁴¹ *Ibid.*, Article 3 (3).

Moreover, even though spent fuel and radioactive waste from military or defence programmes are out of the scope of the Convention, paragraph (viii) of the preamble states that they have anyway to be managed “in accordance with the objectives stated in this Convention”²⁴². Finally, the Convention is also applicable to discharges, defined in Article 2 as “planned and controlled releases into the environment, as a legitimate practice, within limits authorized by the regulatory body, of liquid or gaseous radioactive materials that originate from regulated nuclear facilities during normal operation”²⁴³.

After having defined objectives, scope of application and clarified the meaning of some key terms (Article 2), the Convention follows with two chapters with identical structure and very similar provisions that contain the substantive obligations. Chapter 2 tackles the “safety of spent fuel management”, while Chapter 3 the “safety of radioactive waste management”. Similarities are due to the fact that, though they are considered distinct resources, they entail somewhat the same risks and dangers and for this reason they require very similar requirements and practices for their management, as also recognized in the Preamble when, at paragraph (ii), it is pointed out that “the same safety objectives apply both to spent fuel and radioactive waste management”²⁴⁴. The provisions contained in the two chapters are aimed at realizing practically the objective set out in Article 1, so compliance will help to minimize the risks, and protect individual and the environment from the dangers associated with the management of spent fuel and radioactive waste. Both Chapters contain dispositions regarding “general safety requirements” (Article 4 and 11), “existing facilities” (Article 5 and 12), “siting of proposed facilities” (Article 6 and 13), “design and construction of facilities” (Article 7 and 14), “assessment of safety of facilities” (Article 8 and 15), “operation of facilities” (Article 9 and 16). Again particularly relevant and worth of mention, are first of all the dispositions on the siting of proposed facilities. However, the dispositions contained in Article 6 and Article 13, in part perfectly mirror those already analyzed for the Nuclear Safety Convention. What differs between the two conventions is that the Joint Convention provides that information on the safety of facilities shall be made available to the public (Article 6 (1) (iii) and Article 13 (1) (iii)) and also to neighboring Contracting Parties to the extent that they can be impacted by such facility and in order for them to assess the possible negative effects of a given facility within their borders (Article 6 (1) (iv) and Article 13 (1) (iv)). The obligation to share relevant information is instrumental for the fulfillment of the principle of cooperation and transparency, as

²⁴² Ibid., Preamble (viii)

²⁴³ Ibid., Article 2 (c).

²⁴⁴ Ibid., Preamble (ii)

already noted. Most importantly, Article 6 (2) and Article 13 (2) stipulates that “Contracting Party shall take the appropriate steps to ensure that such facilities shall not have unacceptable effects on other Contracting Parties by being sited in accordance with the general safety requirements [...]”²⁴⁵ which reflects the meaning of the no harm principle.

Following with the definition of Contracting Parties’ obligations, Chapter 4 of the Joint Convention contains “general safety provisions”. Since they perfectly replicate the content of the corresponding articles of the Nuclear Safety Convention, there is no need to reanalyze them since the same considerations provided before remain valid and apply to the Joint Convention. Finally, the Joint Convention and the Nuclear Safety convention are “twins” also for what concerns the dispositions regarding the “meetings of the Contracting Parties” or peer review mechanism (Chapter 6) through which the incentive character of the Convention is realized.

2.3. Meaning and pitfalls of the “incentive conventions”.

Both the Nuclear Safety Convention and the Joint Convention on the Safety of Spent Fuel Management and of the Safety of Radioactive Waste Management are “incentive Conventions”, as stated in paragraph (vii) of the preamble of the former Convention and in paragraph (ix) and (x) of the latter. Wright affirms that “the term ‘incentive convention’ [...] is a term without precise meaning or international law precedent”²⁴⁶. The concept was first introduced in the Nuclear Safety Convention and then applied also to the Joint Convention in order to build consensus and find a solution to accommodate all parties’ interests, needs and concerns with the purpose of encouraging participation. More precisely, both conventions are labelled in such a way because they aim at providing incentives to States to enhance the safety of nuclear facilities and activities through meetings and peer reviews, instead of establishing a traditional enforcement mechanism based on sanctions and penalties²⁴⁷. In this sense, the efficacy of such type of convention relies and is based on the presence of a collective interest among Contracting Parties in attaining the highest possible level of nuclear safety and the presence of peer pressure, but also encouragement and emulation that is triggered by the peer process are fundamental and prove crucial for the legitimacy and credibility of the Conventions²⁴⁸.

²⁴⁵ Ibid., Article 6 (2) and Article 13 (2).

²⁴⁶ Wright T. (2007). ‘The ‘incentive’ concept as developed in the nuclear safety convention and its possible extension to other sectors’, in *Nuclear Law Bulletin*, Vol.2007/2, p. 32.

²⁴⁷ Ibid., p.38.

²⁴⁸ Ibid., p.38, 39.

The specific obligations incumbent on Contracting Parties regarding the peer review mechanism are contained in Chapter 3 of the Nuclear Safety Convention and in Chapter 6 of the Joint Convention. However, further and more specific guidance is provided in the “Guidelines Regarding the Review Process”. Both stipulates that Contracting Parties have the obligation to organize meetings in order to review States’ reports about the measures that have been domestically implemented to fulfill the objectives of the Conventions, and during the meetings all Contracting Parties shall be granted the possibility to discuss the reports drawn up by their counterparts and to receive clarifications on them.

Both Conventions establish that review meetings shall be held at least every three years and that extraordinary meetings can take place if deemed appropriate by the majority of the Contracting Parties. As far as attendance is concerned, Contracting Parties shall participate to the meetings and they may decide (it is not an obligation) to invite, to attend the meetings, any international organization that is considered to be competent about the issues regulated by the Conventions. Moreover, it is established that the content of the discussions held during the meetings about the review of the reports shall remain confidential, but there subsist the obligation on the part of the Contracting Parties to “[...] adopt, by consensus, and make available to the public a document addressing issues discussed and conclusions reached during a meeting”²⁴⁹. Regarding the provisions about reporting, meaning on the specific information that the reports shall contain and issues they shall address, they are described in a much more punctual and detailed way in article 32 of the Joint Convention, while the Convention on Nuclear Safety contains very vague and superficial indications. Finally, both Conventions establish the role that the IAEA shall have in the context of the review meeting: it is, in this case, a mere organizational role, since it acts as a service provider; indeed, the IAEA

1. [...] shall provide the secretariat for the meetings of the Contracting Parties. 2. The secretariat shall: (i) convene, prepare and service the meetings of the Contracting Parties; (ii) transmit to the Contracting Parties information received or prepared in accordance with the provisions of this Convention. [...] 3. The Contracting Parties may, by consensus, request the Agency to provide other services in support of meetings of the Contracting Parties²⁵⁰.

²⁴⁹ Convention on Nuclear Safety, Article 24; Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radiological Waste Management, Article 34.

²⁵⁰ Convention on Nuclear Safety, Article 28; Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radiological Waste Management, Article 37.

The review mechanism is fundamental, especially in the case of the Nuclear Safety Convention, because no other enforcement and dispute settlement mechanisms are envisaged. Consequently, “since the review process represents the sole ‘enforcement’ feature of the CNS, a failure to fulfil these procedural requirements would represent a serious breach of treaty obligations”²⁵¹. In other words, the peer review process is the only method available to Contracting Parties to ensure compliance and solve disputes given that, in opposition to the majority of international treaties, it does not contain any reference to dispute settlement bodies like the ICJ or arbitral tribunals. On the other hand, concerning the Joint Convention, though the main dispute settlement mechanisms remains the peer review process, Article 38 provides that “[...] In the event that the consultations prove unproductive, recourse can be made to the mediation, conciliation and arbitration mechanisms provided for in international law [...]”²⁵²; however, this is considered a last resort.

A very important thing to stress is that the peer review mechanism gives rise to a system of progressive development, in the sense that the attainment of the highest level of nuclear safety is not guaranteed by the expeditious complete implementation of the obligations contained in the convention, but there is gradual and step-by-step progress at stake, made possible by the high degree of socialization created by the meetings that push Contracting Parties to learn, improve acquiring new technical knowledge, and adapt to best practices, as well as to evaluate the current state of affairs, progress made regarding the implementation of the obligations spelt out in the Conventions and identify gaps or weaknesses in States’ measures²⁵³.

Resuming what has been anticipated above, the possibility of concluding an incentive convention allows to include only vague and unprecise obligations, so that the text can satisfy the needs and address the concerns of a larger set of States, thus increasing participation to the convention, but at the same time, in this way the effectiveness of the convention relies exclusively on States’ willingness to cooperate productively and in good faith. The fact that both Conventions are based on fundamental general principles of safety rather than strict and detailed requirements and standards is explicitly mentioned in paragraph (vii) of the preamble of the Convention on nuclear Safety and, more implicitly, in paragraph (xiv) of the preamble of the Joint Convention where the “International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of

²⁵¹ Wright T. (2007). ‘The ‘incentive’ concept as developed in the nuclear safety convention and its possible extension to other sectors’, in *Nuclear Law Bulletin*, Vol.2007/2, p. 35.

²⁵² Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radiological Waste Management, Article 38.

²⁵³ Wright T. (2007). ‘The ‘incentive’ concept as developed in the nuclear safety convention and its possible extension to other sectors’, in *Nuclear Law Bulletin*, Vol.2007/2, p. 39-40.

Radiation Sources”, “Principles of Radioactive Waste Management” developed by the IAEA and other “existing international standards” are cited²⁵⁴. However, in light of the conventions’ vagueness or “normative indeterminacy”²⁵⁵, as Handl defines it, the reference to existing standards that are periodically updated and upgraded that serve as guidance for Contracting Parties to achieve the Conventions’ objectives is a way to solve the texts normative weakness²⁵⁶. Indeed, Handl claims that “these references do provide interstitial normative materials that fill outright gaps in the principal instruments themselves, or compensate for the latter’s relative lack of normative specificity”²⁵⁷. Moreover, to the extent that these standards and principles, that are traditionally non-binding, are used as guidance and point of reference in the peer review process to assess States measures, progress and compliance with Conventions’ obligations and objectives, they turn into *de facto* binding instruments²⁵⁸.

Apart from this general considerations on the implications of an incentive mechanism, the most important thing to explore is its effectiveness. First of all, structural issues have to be underlined. The peer review mechanism, as the expression describes, consists in the submission of self-produced reports by States to other States that are considered the only legitimate judges. Nevertheless, the absence of a *super partes* international adjudicative body may lead to the fact that strong criticisms and condemnation in the case of non-compliance is quite improbable, thus raising doubts about under-enforcement. Indeed, given the high sensitivity of the issue of nuclear safety that is caused by the link to national sovereignty and national security matters, States might prefer to adopt an accommodative approach, hoping to receive the same treatment by their peers and avoiding deep scrutiny. Of course, this scenario is really negative because it would mean that the peer review process is weak and it does nothing to ensure full compliance with the Conventions’ objectives²⁵⁹.

²⁵⁴ Pelzer N. (2006). ‘Learning the hard way: did the lessons taught by the Chernobyl nuclear accident contribute to improving nuclear law?’, in IAEA-NEA, *International nuclear law in the post-Chernobyl period*, p.90

²⁵⁵ The softness of the Conventions obligations is clear for example analyzing Article 6 of the Nuclear Safety Convention that tacking the measures to be undertaken to ensure the safety of nuclear installations uses expressions like “as soon as possible”, “reasonably practicable”, “as soon as practically possible” and regarding the shutdown of nuclear installations in case safety upgrading are not possible, dispositions take the form of suggestions, not obligations. The same can be said for Article 4 and 5, 11 and 12 of the Joint Convention where expressions like “appropriate”, “adequate”, and “reasonably practicable” appear.

²⁵⁶ Handl G. (2003). ‘The IAEA Nuclear Safety Conventions: an example of successful “treaty management”?’, in *Nuclear Law bulletin*, Vol.2003/2, No.72, p. 14.

²⁵⁷ *Ibid.*, p. 15

²⁵⁸ *Ibid.*, p. 16.

²⁵⁹ *Ibid.*, p. 19.

In order to avoid under-compliance, Contracting Parties of both Conventions have created a system of group division to assess national reports, whose compositions is changed periodically to avoid the emergence of solidarity among members. Groups are made of States with different characteristics: nuclear States and non-nuclear States, States with a long experience in the field and other that are developing those technologies. This variety is essential to ensure the process effectiveness²⁶⁰. Moreover, in order to increase even more the legitimacy, there is also the possibility of inter-group participation (though with some limitations) and collegial additional discussion during the plenary sessions²⁶¹. Considering the fact that the system is a state-centered one, there is another possible pitfall to consider: that of legitimacy. Since States are judged by peers, they might consider them as lacking the necessary authority, implicitly referring to the principle of sovereign equality²⁶².

Another source of suspicion regarding the effectiveness of the review process concerns attendance: intergovernmental organizations, “competent in respect of the matters governed by this convention”²⁶³ (so the set is restricted) can participate but only after invitation approved by consensus by Contracting Parties, and NGOs and representatives of the civil society are not allowed. While this reluctance to include other parties can be due to concerns for the dissemination of information that are considered highly sensitive, this degree of secrecy and closeness can be counterproductive, in the sense that it can jeopardize public support and confidence in nuclear safety²⁶⁴. Linked to this, there is the problem of confidentiality that regards both the information included in reports and that disclosed during group debates. As provided by the relevant Conventions’ Articles, “outsiders” are prevented from getting to know the topics tackled during the debates; they can only rely on the summary reports that are very general, since they have to guarantee the respect of confidentiality²⁶⁵.

Regarding information, the effectiveness of the process can also be diminished by two further factors. First, the content and structure of reports is fundamental: reports are self-assessments, so

²⁶⁰ Ibid., p.19.

²⁶¹ Guidelines Regarding National Reports under the Convention on Nuclear Safety, INFCIRC/572/Rev.5.; Guidelines Regarding the Review Process, IAEA Doc. INRCIRC/603.

²⁶² Handl G. (2003). ‘The IAEA Nuclear Safety Conventions: an example of successful “treaty management”?’, in *Nuclear Law bulletin*, Vol.2003/2, No.72, p.25.

²⁶³ Convention on Nuclear Safety, Article 24 (2); Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radiological Waste Management, Article 33 (2).

²⁶⁴ Handl G. (2003). ‘The IAEA Nuclear Safety Conventions: an example of successful “treaty management”?’, in *Nuclear Law bulletin*, Vol.2003/2, No.72, p.21.

²⁶⁵ Pelzer N. (2006). ‘Learning the hard way: did the lessons taught by the Chernobyl nuclear accident contribute to improving nuclear law?’, in IAEA-NEA, *International nuclear law in the post-Chernobyl period*, p.93.

basically each State has a very high degree of discretion about what to mention and what to omit or treat superficially; in addition, “each contracting party has the right to submit a National Report with the form, length and structure it believes necessary to describe how it has implemented its obligations under the Convention”²⁶⁶ which poses a problem of comparability, data analysis and discussion. Finally, but maybe most importantly, the peer review mechanism does not have any coercive character, so it only rely on single Contracting Parties’ willingness to cooperate in good faith²⁶⁷.

However, in light of data and observations following the first review processes, it seems that doubts and suspicion about the effectiveness of the mechanism were unsubstantiated. Indeed, “developments that have occurred during the application of the review process demonstrate not only significant progress towards safety-related improvements but also a willingness of the Parties to fully contribute to the process”²⁶⁸. It is not true that States try to be kind with each other, especially if review groups are made of countries with different interests and concerns²⁶⁹. Furthermore, no Contracting Party likes to be criticized by its peers, so the prospect of careful reviews exercise normative pressure on States that, knowing that their conduct will be assessed, will stive to adopt all possible measures to avoid criticism that create embarrassment; no State wants to be considered backward, but on the contrary, even though information about nuclear programmes are considered very sensitive and there is reluctance about their disclosure, showing to be at the forefront of technological development and progress in the field of nuclear safety is also a matter of pride and national prestige. As a consequence, the system works also thanks to the eagerness of Contracting Parties to present themselves as guides, examples to be followed in terms of technological advancement and new practices. This is the key to create incentives for the spread of best practices, knowledge and the consequent improvement of international nuclear law and the degree of nuclear safety worldwide.

3. Nuclear Security: the Convention on the Physical Protection of Nuclear Material and Nuclear Facilities (CPPNM).

²⁶⁶ Guidelines Regarding the Review Process (2002), IAEA Doc. INFIRC/572/Rev.5.

²⁶⁷ Handl G. (2003). ‘The IAEA Nuclear Safety Conventions: an example of successful “treaty management”?’, in *Nuclear Law bulletin*, Vol.2003/2, No.72, p. 26.

²⁶⁸ Rautenbach, J., Tonhauser, W. and Wetherall, A. (2006). ‘Overview of the International Legal Framework Governing the Safe and Peaceful Uses of Nuclear Energy – Some Practical Steps’, in *International Nuclear Law in the Post-Chernobyl Period*, OECD, p. 14.

²⁶⁹ Pelzer N. (2006). ‘Learning the hard way: did the lessons taught by the Chernobyl nuclear accident contribute to improving nuclear law?’, in IAEA-NEA, in *International nuclear law in the post-Chernobyl period*, p. 95.

Nuclear security refers to “the prevention and detection of, and response to, theft, sabotage, unauthorized access, illegal transfer or other malicious acts involving nuclear material, other radioactive substances or their associated facilities”²⁷⁰.

Even though it is widely recognized that it is States who bear the primary responsibility for ensuring the nuclear security within their borders, because of the great concern for the proliferation of nuclear weapons and the threat of nuclear terrorism, nuclear security has always attracted considerable attention at the international level and the ample consideration given to the Convention on the Physical Protection of Nuclear Material, which was adopted under the IAEA auspices and entered into force in 1987, is a clear evidence of this tendency and of the ensuing willingness of States to welcome binding obligations²⁷¹. International cooperation in the field has increased following the acknowledgement that “the ability to prevent, detect and respond to the threats to nuclear security within one State is affected by the adequacy and effectiveness of nuclear security measures taken by other States, particularly when nuclear material is transported across national frontiers”²⁷², and in enhancing and incentivizing it the IAEA played a fundamental role. Indeed the agency received a primary mandate “to accelerate and enlarge the contribution of atomic energy to peace [emphasis added], health and prosperity throughout the world”²⁷³.

The Chernobyl nuclear accidents did not play a key role for the improvement of international nuclear security also because its causes were not related to security but to safety issues. However, the nuclear accident contributed to demonstrate the importance of preventing any event that can lead to radiological disasters. What instead pushed toward the further strengthening of the nuclear security regime, including the initiation of the amendment process to the CPPNM, that is for sure the most important instrument in the field, was the worrying increase in cases of unlawful nuclear materials trafficking that emerged after the collapse of the Soviet Union²⁷⁴. Moreover, nuclear security and consequently the Convention on the Physical Protection of Nuclear Material acquired particular relevance after the terrorist attacks of 11th September 2001, since this Convention is part of the family of counter-terrorism instruments in that it establish a framework for the prevention of terrorist acts stemming from “illicit trafficking, the unlawful taking and use of nuclear

²⁷⁰ IAEA (2011). *The international legal framework for nuclear security*. Vienna: IAEA, p. 1.

²⁷¹ Pelzer N. (2006). ‘Learning the hard way: did the lessons taught by the Chernobyl nuclear accident contribute to improving nuclear law?’, in IAEA-NEA, *International nuclear law in the post-Chernobyl period*, p. 96

²⁷² IAEA (2011). *The international legal framework for nuclear security*. Vienna: IAEA, p. 1.

²⁷³ IAEA Statute.

²⁷⁴ Orlov V. A. (2004). ‘Illicit Nuclear Trafficking and the New Agenda’, in *IAEA Bulletin* 46/1, pp. 53-56.

material”²⁷⁵. Because of the efforts that followed the dramatic events of New York to strengthen the international regime for the fight against terrorism, in 2005 Contracting Parties adopted an amendment to the Convention²⁷⁶ that entered into force only in 2016. The following analysis is based on the amended Convention whose title is Convention on the Physical Protection of Nuclear Material and Nuclear Facilities, which already signals the enlargement of the Convention’s scope of application.

The Convention has three main objectives that are listed in Article 1A, which was included with the amendment: the first one, as the title of the Convention clearly suggest, consists in the attainment and maintenance of “worldwide effective physical protection of nuclear material used for peaceful purposes and of nuclear facilities used for peaceful purposes”; second, it has the purpose of “[preventing and combatting] offences[relating to such material and facilities worldwide]”; third, it aims at strengthening cooperation among Contracting Parties to carry out the abovementioned objectives. International cooperation in the field of nuclear security is even more crucial than in the field on nuclear safety since the former has to do not only with possible transboundary impacts of radiations and the consolidation of best common practices, but also with the operation of international illegal networks of criminals whose actions can be prevented, detected and punished only through intense cooperation.

Article 2 sets out the scope of application of the Convention and stipulates that it “shall apply to nuclear material used for peaceful purposes in use, storage and transport and to nuclear facilities used for peaceful purposes, provided, however, that articles 3 and 4 and paragraph 4 of article 5 of this Convention shall only apply to such nuclear material while in international nuclear transport”²⁷⁷, so from this wording it is already clear that the Convention, as the Convention on nuclear safety, do not apply to materials employed in the context of military programmes, but their exclusion is made explicit in Article 2(5). Moreover, this convention as well clearly provides that “the responsibility for the establishment, implementation and maintenance of a physical protection regime within a State Party rests entirely with that State”²⁷⁸; according to Article 2A, that was included with the amendment, and specifically in paragraph 1, such regime has to be applied to ensure the security of both nuclear material and facilities with the aim to protect them against theft, other illicit actions and sabotage, and to mitigate or minimize the consequences in terms of biological risks, including

²⁷⁵ Convention on the Physical Protection of Nuclear Material (2005), Preamble.

²⁷⁶ Gioia A. (2012). ‘Nuclear Accidents and International Law’, in de Guttry et al. (eds.) *International Disaster Response Law*. 1st edn. The Hague: T.M.C. Asser Press, pp. 91-92.

²⁷⁷ Convention on the Physical Protection of Nuclear Material (2005), Article 2A (1).

²⁷⁸ Convention on the Physical Protection of Nuclear Material (2005), Article 2A (2).

the enactment of prompt measures to restore a situation of security by tracking and regaining possession of subtracted nuclear materials, also acting in cooperation with other States if they are found outside the territory of the State from which the illicit action originated. Of course, this is strictly linked to the observations made in the previous Chapter about the importance of preparedness and well-designed emergency plans in order to prevent possible disasters or minimize their effects: if nuclear materials are stolen or sabotaged, clear action plans must already be in place, so that competent authorities know the steps that must be undertaken to sort the situation out as quickly as possible and with the minimum impact possible on the population and the environment. Paragraph 2 of Article 2A, then, provides that, in order to implement the provisions indicated in the previous paragraph of the same article, States shall set up and maintain a legislative and regulatory framework to be implemented by designated competent authorities, and to take all possible further measures to guarantee the physical protection of nuclear material and facilities. Paragraph 3, always of Article 2A provides that “in implementing the obligations under paragraph 1 and 2, each State Party shall, without prejudice to any other provisions of this Convention, apply insofar as is reasonable and practicable the following Fundamental Principles of Physical Protection of Nuclear Material and Nuclear Facilities”²⁷⁹. This paragraph was the most difficult to be negotiated during the process of amendment; the Fundamentals²⁸⁰ are a soft law instrument which clashes with the binding nature of the convention and for this reason there were disagreements on how to deal with them²⁸¹. In this regard, some States contested the expression “shall apply” claiming for more flexibility. To reach a compromise the phrase “insofar as is reasonable and practicable” was included in order to moderate the obligation in the application of the Fundamentals²⁸². This adjustment creates room for more flexibility that allows States to apply the Fundamentals according to the domestic situation and context, but on the other hand the paragraph is anyway formulated as an obligation.

Regarding other States’ obligations, Article 3 establish that

each State Party shall take appropriate steps within the framework of its national law and consistent with international law to ensure [...] that, during international nuclear transport,

²⁷⁹ Ibid., Article 2A (3)

²⁸⁰ “Nuclear Security Fundamentals specify the objective of a State’s nuclear security regime and the essential elements of such regime”. See IAEA. (2018). *Physical Protection of Nuclear Material and Nuclear Facilities (Implementation of INFCIRC/225/Rev.5)*. Vienna: IAEA.

²⁸¹ Pelzer N. (2006). ‘Learning the hard way: did the lessons taught by the Chernobyl nuclear accident contribute to improving nuclear law?’, in IAEA-NEA, *International nuclear law in the post-Chernobyl period*, p. 98.

²⁸² Ibid.

nuclear material within its territory, or on board a ship or aircraft under its jurisdiction insofar as such ship or aircraft is engaged in the transport to or from that State, is protected at the levels described in Annex I.

Furthermore, Article 4 provides that Contracting Parties are under the obligation not to export, import and allow the transit through their territory of nuclear materials, unless they have obtained assurances that those given materials will receive protection during their international transportation, according to the provisions indicated in Annex I.

Article 5 is crucial because it is the one that outline the scope of international cooperation and assistance. Indeed, paragraph 2, in particular, provides that State Parties shall cooperate and assist each other “to the maximum feasible extent”, in the case of any actual or possible theft of nuclear material or any other unlawful taking in order to recover and protect such nuclear materials. With this final objective in mind, States are under the obligation to promptly inform the States that could be affected by robbery or other illegal taking of nuclear material, the IAEA and relevant IOs; plus they are under the obligation to exchange information reciprocally and also to render assistance if the affected State requests it.

As well as the strong emphasis on cooperation to prevent disasters or minimize the consequences, the other fundamental part of the Convention where cooperation is anyway important concerns the institution of criminal proceedings against alleged offenders involved in the commission of illegal acts related to nuclear facilities and material which is clearly listed in Article 7. Subsequently, Article 8 identifies the rules on the establishment of jurisdiction that follow the well-established and universally accepted international norms. Article 8 states that States Parties shall exercise jurisdiction over the offences indicated in Article 7 when such offences take place within their territory (ships and aircrafts included), the alleged offender is a State national or in the event that the alleged offender is caught in their territory and it is not extradited, in accordance with the customary principle *aut dedere aut judicare*, whose content is also reiterated in Article 10. Then, it is Article 13 that outline the importance of cooperation during criminal proceedings; indeed it provides that “States Parties shall afford one another the greatest measure of assistance in connection with criminal proceedings brought in respect of the offences set forth in article 7, including the supply of evidence at their disposal necessary for the proceedings [...]”²⁸³.

²⁸³ Ibid., Article 13 (1).

The last thing to note is that the Convention on the Physical Protection of Radioactive Materials is not an incentive convention because Article 17 stipulates that any dispute regarding the interpretation or application of the Convention shall be solved through consultation and negotiation among the Parties involved; if this settlement method proves fruitless, then any of the Parties involved shall refer to arbitration or the ICJ.

All in all, especially with the amendment that broadened the scope of the Convention, it can be argued that the Convention is a valuable instrument to enhance the level of nuclear security. The only weakness point regards paragraph 3 of Article 2A because, referring to the application of the Fundamental Principles of Physical Protection of Nuclear Material and Nuclear Facilities, the phrase “insofar as is reasonable and practicable” insert a soft law component into a binding instrument thus, as Pelzer claims, giving the amended text a hybrid character²⁸⁴. However, as the discussion on the safety conventions has demonstrated, soft law elements do not automatically jeopardize the solidity of the Convention on condition that mechanisms like that of the incentive conventions push toward their full implementation. The problem is that the Convention on the Physical Protection of Nuclear Material and Nuclear Facilities does not have an incentive character and concerns increase if consideration is given to the fact that during the negotiation process a considerable number of States clamored for more flexibility in the application of fundamentals: without all the positive incentives coming from a peer review mechanism, the wording of the paragraph, made softer by the abovementioned phrase, gives States the possibility to easily refer to socio-economic circumstances to avoid appropriate application of the Fundamentals, something can jeopardize the full meeting of the Convention’s objectives²⁸⁵.

The CPPNM assigns a specific and active role to the IAEA: it serves as point of convergence for information collection - and when necessary dissemination - regarding all issues addressed by the Convention, with particular attention to Contracting Parties competent authorities and points of contact (Article 5(1)), facilitation and coordination of actions in case of theft, sabotage or any other unlawful taking of radioactive material (Article 5 (2)), laws and regulation adopted domestically in order to put into practice the obligation set out in the Convention (Article 14 (1)), result of criminal proceedings (Article 14 (2)); in addition, more generally, the IAEA plays a pivotal role in providing

²⁸⁴ Pelzer N. (2006). ‘Learning the hard way: did the lessons taught by the Chernobyl nuclear accident contribute to improving nuclear law?’, in IAEA-NEA, *International nuclear law in the post-Chernobyl period*, pp.73-118.

²⁸⁵ Ibid., p. 99.

assistance to Contracting States, prior request, with a view to help them in meeting the Convention's obligations²⁸⁶.

3.1 The role of UNSC Resolutions in strengthening the regime on nuclear security and the relevance of the CPPNM

In the aftermath of the terrorist attacks of 11th September 2001, the UNSC adopted Resolution 1373 (2001). Such Resolution, adopted under Chapter VII of the UN Charter and thus binding on States, affirmed the condemnation of the UNSC towards the terrorist attacks and reiterated the necessity to fight, through all possible means and in accordance with the UN Charter, all such acts being a fundamental threat to international peace and security²⁸⁷. To achieve this objective, the UNSC urged States to cooperate and work together in order to prevent and suppress acts of terrorism and to become parties, or proceed with the full implementation, of all the main conventions and protocols concerning international terrorism, including the CPPNM, being one of them²⁸⁸. The most important point, in light of the present discussion, lies in

[noting] with concern the close connection between international terrorism [...] and illegal movement of nuclear, chemical, biological and other potentially deadly materials, and in this regard emphasizes the need to enhance coordination of efforts on national, subregional, regional and international levels in order to strengthen a global response to this serious challenge and threat to international security²⁸⁹;

This Resolution and the terrorist attack itself had for sure an important impact in the process of amendment of the CPPNM and in reiterating the importance of the adherence to counter-terrorism conventions, of which the CPPNM is one, as well as implicitly enhancing the role of the IAEA since the importance of international cooperation was considered fundamental.

The second relevant landmark resolution is Resolution 1540 (2004) which is fundamentally linked to the CPPNM. It expresses great concern for the threat that the proliferation of nuclear, chemical and biological weapons, especially connected to unlawful trafficking and the operation of non-state

²⁸⁶ IAEA (2011). *The international legal framework for nuclear security*. Vienna: IAEA, p.19.

²⁸⁷ UNSC (2001). Resolution 1373 (2001) Adopted by the Security Council at its 4385th meeting, on 28 September 2001, S/RES/1373.

²⁸⁸ Ibid.

²⁸⁹ Ibid. (4).

actors, pose to international peace and security; for this reason, it urges States to take all possible effective measures to address this threat²⁹⁰. In this regard, the Resolution mentions several measures to be taken which were already contained in the CPPNM as obligations incumbent on States Parties (e.g. para 3(c)), thus considerably increasing the importance of such Convention and of IAEA itself, since it plays a key role in promoting adherence to the Convention and providing assistance to Contracting States in fulfilling their obligations. However, the importance of the IAEA and of the CPPNM is also explicitly mentioned in the Resolution: it recognizes that

most States have undertaken binding legal obligations under treaties to which they are parties, or have made other commitments aimed at preventing the proliferation of nuclear, chemical or biological weapons, and have taken effective measures to account for, secure and physically protect sensitive materials, such as those required by the Convention on the Physical Protection of Nuclear Materials and those recommended by the IAEA Code of Conduct on the Safety and Security of Radioactive Sources²⁹¹

and urged States to “renew and fulfil their commitment to multilateral cooperation, in particular within the framework of the International Atomic Energy Agency, [...] as important means of pursuing and achieving their common objectives in the area of non-proliferation and of promoting international cooperation for peaceful purposes”²⁹². Therefore, the task of the IAEA in providing assistance to States with the aim of facilitating the fulfillment of their obligations in the field of nuclear security is fundamental not only considering the meeting of the CPPNM objectives, but, to the extent that the steps required by the Resolution in part mirror the obligation contained in the CPPNM, the role of the IAEA is fundamental also to help States in meeting their obligations stemming from the Resolution.

4. Emergency Preparedness and Response: the Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency.

²⁹⁰ See UNSC (2004). Resolution 1540 (2004) Adopted by the Security Council at its 4956th meeting, on 28 April 2004, S/RES/1540.

²⁹¹ Ibid.

²⁹² Ibid., 8 (c).

The obligations and rules about emergency preparedness and response can be considered as part of the field of nuclear safety, according to the same definition of nuclear safety. However, because of the primary importance attached to it in the aftermath of the Chernobyl nuclear accident, the legal framework on emergency preparedness and response to radiological emergencies deserves separate analysis. The conventions already examined contain several provisions related to emergency preparedness and response, but the two main binding instruments that focus specifically on the topic are two: the Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency. They were both adopted on 26th September 1986 under the auspices of the IAEA, in record time after the Chernobyl disaster which dramatically showed a gap in the international organization and coordination in this two areas, as well as an overall lack of clearly-established obligations²⁹³. The preamble of the two conventions is almost identical: both highlight that steps had already been undertaken to enhance the safety of nuclear activities and prevent or at least minimize the consequences of nuclear accidents; moreover, they underline the desire of Contracting Parties to “strengthen further international co-operation in the safe development and use of nuclear energy”²⁹⁴. The Preamble of the Early Notification Convention, then, expresses the conviction of Member States regarding the necessity “to provide relevant information about nuclear accidents as early as possible in order that transboundary radiological consequences can be minimized”²⁹⁵ whereas, in accordance with its scope and objectives, the Assistance Convention points out the Parties conviction about “the need for an international framework which will facilitate the prompt provision of assistance in the event of a nuclear accident or radiological emergency to mitigate its consequences”²⁹⁶.

4.1. The content of the Convention on Early Notification of a Nuclear Accident.

The Convention opens up defining the scope of application. Article 1 (1) states that the Convention

shall apply in the event of any accident involving facilities or activities of a State Party or of persons or legal entities under its jurisdiction or control, [...], from which a release of radioactive

²⁹³ Pelzer N. (2006). ‘Learning the hard way: did the lessons taught by the Chernobyl nuclear accident contribute to improving nuclear law?’, in IAEA-NEA, *International nuclear law in the post-Chernobyl period*, p.79

²⁹⁴ Convention on Early Notification of a Nuclear Accident (1986), Preamble.

²⁹⁵ Ibid.

²⁹⁶ Convention on Assistance in the Case of a Nuclear Accident or Radiological emergency (1986), Preamble.

material occurs or is likely to occur and which has resulted or may result in an international transboundary release that could be of radiological safety significance for another State²⁹⁷.

Then, Article 1 (2) lists and specifies the specific set of facilities and activities to which the Convention applies.

In case of a nuclear accident falling under the scope of the Convention, State Parties in which the accident occurs shall, in accordance with Article 2, “forthwith [emphasis added] notify, directly or through the International Atomic Energy Agency [...], those States which are or may be physically affected [...] and the Agency of the nuclear accident, its nature, the time of its occurrence and its exact location where appropriate”²⁹⁸, as well as “promptly” giving available information that are meaningful to minimize the adverse impact of radiological emergencies in neighboring States, following the instruction provided in Article 5 that specifies the type of information and data that shall be communicated. In addition, information shall be updated and supplemented following the evolution of the situation at appropriate intervals (Article 5 (2)), and each State Party from which the emergency originated shall “as far as it is reasonably practicable”, give prompt answer to requests, coming from an affected neighboring State Party, for additional information or consultation, with the aim of minimizing the radiological impact and consequences in such State (Article 6). Of fundamental importance is the content of Article 3. It provides that “with a view to minimizing the radiological consequences, States Parties may notify in the event of nuclear accidents other than those specified in article 1”²⁹⁹. It is meaningful to note that the Article does not establish an obligation, but the notification in this case is on a voluntary basis. It refers, for instance, to accidents occurring in the realm of military programmes on which States are always reluctant to reveal information as a matter of national security issues, even though in case of accidents notification is of vital importance.

In the case in which notification of a nuclear accident or emergency and subsequent further information is provided to the IAEA, it is under the obligation to inform all States that can be potentially affected, namely Contracting Parties, but also IAEA member States that are not parties to the Convention and also other States and relevant international organizations (Article 4). In Brief, the IAEA serves the function of focal point for information reception and dissemination, thus

²⁹⁷ Convention on Early Notification of a Nuclear Accident (1986), Article 1 (1).

²⁹⁸ Ibid., Article 2 (a).

²⁹⁹ Ibid., Article 3.

creating a more efficient and rapid network of communication that is fundamental in the event of nuclear accidents when the time factor is literally vital.

In order to give practical and operative substance to the information network, according to Article 7 (1), State Parties are obliged to establish and communicate directly or through the IAEA, information about competent authorities and point of contact that are “responsible for issuing and receiving the notification and information referred to in article 2”³⁰⁰ and any subsequent modification (Article 7 (2)). Moreover, under Article 8 the IAEA is assigned also an assistance task (upon request and in accordance with its Statute) in support of non-nuclear State Parties which border a nuclear State that is not a member of the Convention: the IAEA shall carry out investigations in order to assess the feasibility and help in the establishment of a proper system for the monitoring of radiations, with the purpose of facilitating the meeting of the Convention’s goals. It can be said that the dispositions regarding the practical steps to be undertaken to support the creation and maintenance of the communication system included in the Convention are rather generic. To fill this gap, guidance documents have been produced, like the Emergency Notification and Assistance technical Operations Manual and Operations Manual for Incident and Emergency Communication that specify the specific role of the several domestic authorities that shall be established and of the same IAEA³⁰¹. In addition, several systems were created in order to make communication as smooth, punctual and rapid as possible, and enhance transparency (e.g. NEWS-Nuclear Events Web-based System, and the Unified System of Information Exchange in Incidents and Emergencies (USIE))³⁰². In this regard, particular attention should be devoted to the IAEA Incident and Emergency Centre (IEC) which is the core operational and warning point, active H24, to which all notifications and information messages coming from States and relevant IOs regarding nuclear accidents or radiological emergencies and requests or offers of assistance are funneled. As a consequence, the IEC contributes substantially to the facilitation and support to cooperation among Contracting Parties, but it also serves to maintain contacts with other States and relevant IOs.

Assessing the strengths and weakness of this Convention, it can be said that it has a major weak point that lies in the specification of its scope of application. As already noted, the Convention apply to accidents involving nuclear facilities and activities “from which a release of radioactive material occurs or is likely to occur and which has resulted or may result in an international transboundary

³⁰⁰ Ibid., Article 7 (1).

³⁰¹ IAEA. (2019). *Operations Manual for Incident and Emergency Communication*. Vienna:IAEA.

³⁰² Ibid.

release that could be of a radiological safety significance for another State”³⁰³. This means that it is up to the State where the accident occurs to determine if the given accident is supposed to be “of a radiological significance for another State”, so there is a high degree of discretion. As a consequence, the State from which the accident originated is under an obligation to notify said accident only if it is considered to have transboundary effects. This said, in the aftermath of the Chernobyl nuclear accident, the URSS claimed that there was no release of radiations that could have detrimental effects for the territory and population of other countries³⁰⁴. For this reason, assuming that the Convention on Early Notification was already in place, the URSS would not have proceeded with the notification of the accident, deeming it not detrimental for other States and the failed notification “would have been in line with the discretion granted to the accident state under Article 1 paragraph 1”³⁰⁵. On the other hand, what is surely a major contribution of the Convention is the fact that from its creation the obligation of notification and its extent is established in clear terms in a binding convention and it is no longer based on principles of customary law that are by far vaguer³⁰⁶.

4.2. The content of the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency.

The Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency was adopted together with the Early Notification Convention in 1986 and entered into force the following year. The provision of assistance is considered as a spikier issue than the simple notification and this complexity is primarily due to the fact that it implies the entrance of foreign personnel in the territory of the requesting States which triggers considerations about State sovereignty, non-interference, the granting of privileges and immunities and so forth³⁰⁷. However, the shock caused by the Chernobyl accident and the consequent acknowledgement of the need to agree on a common framework for assistance provision led to the adoption of a binding instrument. Similarly to the Early Notification Convention, the Assistance Convention is applicable to a wide range of accidents and originating from different sources: it is relevant, of course, for all types of

³⁰³ Convention on Early Notification of a Nuclear Accident (1986). Article 1 (1)

³⁰⁴ Pelzer N. (2006). ‘Learning the hard way: did the lessons taught by the Chernobyl nuclear accident contribute to improving nuclear law?’, in IAEA-NEA, *International nuclear law in the post-Chernobyl period*, p.80.

³⁰⁵ *Ibid.*, p. 80.

³⁰⁶ *Ibid.*, p. 82.

³⁰⁷ *Ibid.*, p.81.

accidents involving nuclear facilities, but also those caused by nuclear and radioactive materials outside nuclear facilities³⁰⁸. Moreover, as the title indicates, the Convention is activatable both in case of nuclear accidents and radiological emergencies. The two expressions are not explicitly defined in the Convention, but nuclear accident is thought to have the same meaning specified in the Early Notification Convention, also due to the fact that the two Conventions were negotiated and adopted together, while as far as the concept of nuclear emergency is concerned, it is not used in the Early Assistance Notification Convention, and it is believed to mean a situation in which there is an alarm but no damage has occurred yet, though a clear definition is lacking³⁰⁹.

Article 1 summarizes the goal of the convention stipulating that

the States Parties shall cooperate between themselves and with the International Atomic Energy Agency [...] in accordance with the provisions of this Convention to facilitate prompt assistance in the event of a nuclear accident or radiological emergency to minimize its consequences and to protect life, property and the environment from the effects of radioactive releases.

Then, Article 2 specifies the “rules of the game” regarding the provision of assistance.

If a State Party needs assistance in the event of a nuclear accident or radiological emergency, whether or not such accident or emergency originates within its territory, jurisdiction or control, it may [emphasis added] call for such assistance from any other State Party, directly or through the Agency, and from the Agency, or, where appropriate, from other international intergovernmental organizations (Article 2 (1)).

It is relevant to note that the Article uses the verb “may”, leaving States a high degree of discretion to decide whether it is appropriate for them to request assistance or not, something that is considered as the main weak point of the Convention. However, it can be said that, in light of the developments in international law that followed the entry into force of the Convention, it is useful to consider this provision in conjunction with the discussion provided in Chapter 1 on the possible presence of duty to request assistance that is discussed in the context of the more general framework of IDRL. Article 2 (2), then specifies that requesting States shall indicate the scope and

³⁰⁸ Gioia A. (2012). ‘Nuclear Accidents and International Law’, in de Guttry et al. (eds.) *International Disaster Response Law*. 1st edn. The Hague: T.M.C. Asser Press, p. 96.

³⁰⁹ Ibid.

type of assistance they necessitate, and any other relevant information that can be useful for potentially assisting States to decide whether they are in a position to render adequate assistance. This said, “each State Party to which a request for such assistance is directed shall promptly decide and notify the requesting State Party, directly or through the Agency, whether it is in a position to render the assistance requested, and the scope and terms of the assistance that might be rendered”; again, States retain full discretion about whether to accept or not to render assistance; so, both in the case of the request and in the provision of assistance there is not any obligation.

Article 3 sets out the terms of assistance direction and control. What is stated in paragraph (a) corresponds to what has already been noted previously analyzing the Draft Articles on the Protection of Persons in the Event of Disasters and other instruments in the field of IDRL, namely that “the overall direction, control, co-ordination and supervision of the assistance shall be the responsibility within its territory of the requesting State” and “It shall also ensure the protection of personnel, equipment and materials brought into its territory by or on behalf of the assisting party” (Article 3 (b)). Nevertheless, there is a substantial difference: the Assistance Convention talks about a “responsibility” of the State, while as already noted, the Draft Articles and other instruments refer to a “primary role”, so the Convention is drawn up in stronger terms.

Also the provisions contained in Article 8 on privileges, immunities and facilities, Article 9 on the transit of personnel, equipment and property that must be facilitated by each State Party, following a request coming from either the requesting or assisting State, and those contained in Article 11 on the termination of assistance are in line with the observations provided in Chapter 1. Indeed, Article 8 (1) states that the State which receives assistance shall grant privileges, immunities and facilities to the personnel providing assistance “for the performance of their functions” and “facilitate the entry into, stay in and departure from its national territory of personnel notified pursuant to paragraph 2 and of equipment and property involved in the assistance” (Article 8 (5)). Obviously, assisting personnel who is granted privileges and immunities have anyway the obligation to respect the domestic norms and laws of the requesting states and they do not have to interfere in internal affairs (Article 8 (7)), dispositions which have long been considered to be customary law. On the other hand, Article 11, similarly to the content of Article 17 of the Draft Article, provide that termination of assistance shall occur after appropriate consultations between the Parties involved, and prior written notification of the request of termination by either of them.

Additional dispositions contained in the Convention regard confidentiality and public statements (Article 6), the possible reimbursement of costs of the services provided (Article 7), and the

resolution of compensation claims and legal proceeding arising as a consequence of the operations performed in within the territory of the State requesting assistance (Article 10).

As for the Early notification Convention, the Assistance Convention as well assign specific roles to the IAEA. According to Article 1 (3), “the States Parties request the Agency, acting within the framework of its Statute, to use its best endeavors in accordance with the provisions of this Convention to promote, facilitate and support the cooperation between States Parties provided for in this Convention”; however, in the framework of this Convention the IAEA is attributed a more active role than just a bridge between member States for the collection and dissemination of information for the facilitation and support of cooperation: Article 2 (6) provides that the Agency itself shall respond to requests of assistance in case of a nuclear accident or emergency, coming both from Contracting Parties and Member States of the IAEA, and it has to take steps to “[make] available appropriate resources allocated for this purpose” (Article 8 (5) (a)); “[transmit] promptly the request to other States and international organizations which, according to the Agency's information, may possess the necessary resources” (Article 8 (5) (b)); and “if so requested by the requesting State, [coordinate] the assistance at the international level which may thus become available” (Article 8 (5) (b)). Regarding this last provision, it should be noted that it underlines that the task of the IAEA is, in case, limited to the coordination of assistance at the international level, not on-site, where the primary responsibility for coordination rests on requesting States. It should be recalled that coordination of assistance can be facilitated by the UN mechanism; the two systems for the coordination of assistance, the UN-led and IAEA one, are complementary because the former is more related with the social and humanitarian crisis that can accompany a nuclear accident while the latter is more related to the management of specialized and technical assistance for the securing of nuclear facilities and materials, so they have different tasks and operate in two different contexts. Further functions of the IAEA are listed in Article 5. First of all, the primary role of the Agency in collecting and disseminating information, when assistance is requested, is reiterated, but in Article 5 (a) this is linked to a sort of advisory role; indeed, apart from indicating the presence of experts, equipment and materials that could be put at the requesting State's disposal, the Agency is asked to provide information about applicable “methodologies, techniques and available results of research relating to response to nuclear accidents or radiological emergencies” (Article 5 (a) (ii)). Another paramount function attributed to the IAEA by the Convention is that of prevention: under Article (5) (b), the Agency, upon request, assists states in drawing up emergency plans and appropriate legislation, devising adequate training programmes to enhance nuclear personnel

preparedness in case of emergencies or accidents, elaborating monitoring programmes for radioactivity detection, procedures and standards, thus strengthening emergency preparedness and response capabilities. Finally with the aim of minimizing the impact of actual or possible accidents on the population and the environment, the IAEA can also be requested by Contracting Parties or Member States to provide, in case of accidents or emergencies, appropriate resources to be utilized for carrying out an initial evaluation of an accident or emergency.

The Convention has been considered as an undisputed step forward in the improvement of nuclear safety and the prevention or minimization of the impacts of nuclear accidents. Nevertheless, some observers point out the looseness of the main provisions: as well as the weakness of Article 2, the majority of them contain the phrase “upon request”, thus failing to deliver a wholly comprehensive instrument entailing well-articulated right and obligations³¹⁰. The Convention reflect what was achievable in light of the complexities related to the provision of assistance identified above and of the need to accommodate everybody’s interests, necessities and concerns with a view to gain a high number of ratification that, especially in the case of assistance to accidents and disasters, is fundamental.

5. Conventions regarding the Liability for Nuclear Damage.

When the Chernobyl nuclear accident broke out, a regime on the liability for nuclear damage was already in place: the Vienna Convention on Civil Liability for Nuclear Damage had been adopted in 1963 and entered into force in 1977, the Paris Convention on Third Party Liability in the Field of Nuclear Energy was adopted in 1960 and entered into force in 1968 and, prior to the Chernobyl accident it had already been amended twice, in 1964 and 1982. They emerged out of the recognition that the possible transboundary impact of nuclear accidents could cause cases of concurrent jurisdiction³¹¹; as a consequence, these conventions aim at providing clear rules on competent courts, on the law that must be applied and on final judgements in terms of recognition and enforcement³¹². However, despite a liability regime was already in place, none of the two

³¹⁰ Moser B. (2006). ‘The IAEA Conventions on Early Notification of a Nuclear Accidents and on Assistance in the Case of a Nuclear Accident or Radiological emergency’, in IAEA-NEA, *International nuclear law in the post-Chernobyl period*, pp.119-129.

³¹¹ Different States involved in a nuclear accident can claim to have jurisdiction basing their argumentations on the subjective territorial jurisdiction, objective territorial jurisdiction or effects doctrine.

³¹² McRae B. (2006). ‘The Compensation Convention: Path to a Global Regime for Dealing with Legal Liability and Compensation for Nuclear Damage’, in IAEA-NEA, *International nuclear law in the post-Chernobyl period*, pp. 187-201.

Conventions could be invoked to offer compensation to the victims of the 1986 accident. This is a consequence of the fact that the URSS was not a Contracting Party to any of the Conventions and it had not developed a domestic liability legislation for nuclear damage³¹³. The accident, therefore, underlined the fact that a strong political effort to induce States to ratify liability treaties and to adopt an appropriate national legislation on the matter was essential. The second problem about the liability regime that the Chernobyl disaster brought to the surface concerns its inappropriateness: what happened in 1986 made clear that existing Convention and domestic laws were not appropriate to deal with the consequences of such kind of accidents, whose impacts are detectable thousands of kilometers away from the origin and involve millions of people. So, the accident triggered a process of revision of the existing regime that has primarily to do with the territorial scope and the compensation total amount, but it also involved the concept of damage since it was acknowledged that the impact of radiation was broader than that envisaged in the Convention³¹⁴.

From this starting point, the process of revision of the liability regime saw, in 1988, the adoption of the Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention, in 1997 the adoption of the Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage; in the same years also the Convention on Supplementary Compensation for Nuclear Damage was adopted while, regarding the revision of the Paris Convention, in 2004 protocols to amend both said Convention and Brussel Supplementary Convention were adopted.

Before delving into the provisions of aforementioned instruments, it is worth giving a brief look at the principles underlying them. The first one is that providing for the exclusive liability of the operator of the nuclear installation; it means that it is the operator of the facility to be exclusively legally liable for the harm caused, regardless of whom actually committed the act or omission that triggered the accident; this principle responds to the difficulty in identifying the single responsible individuals³¹⁵. The second fundamental principle is the strict liability principle which means that, because of the ultrahazardous nature of nuclear activities, operators are held liable for any damage regardless of whether there was fault or negligence, so if a “damage suffered – accident” causal link

³¹³ Pelzer N. (2006). ‘Learning the hard way: did the lessons taught by the Chernobyl nuclear accident contribute to improving nuclear law?’, in IAEA-NEA, *International nuclear law in the post-Chernobyl period*, p.100.

³¹⁴ Ibid.

³¹⁵ Schwartz J. (2006). ‘International Nuclear Third Party Liability Law: Response to Chernobyl’, in IAEA-NEA, *International nuclear law in the post-Chernobyl period*, p. 40.

is proven, compensation must be granted without any further evidence of fault or negligence³¹⁶.

Third is the limited amount of liability whose importance is well explained by Schwartz:

Governments' desire to encourage the development of the nuclear industry by relieving nuclear operators of the burden of potentially ruinous liability claims in the event of a nuclear accident, led them to adopt a principle which limits the amount of compensation payable to victims by a nuclear operator in the event of an accident for which it is liable. Without it, nuclear operators would be exposed to unlimited liability, meaning that once their available insurance coverage for this risk is exhausted, they would have to resort to their own assets to pay nuclear damage compensation which could, in turn, lead them into bankruptcy³¹⁷.

Fourth, liability is to be financially secured through the stipulation of insurances or other possible means in order to guarantee the presence of funds that can be readily available to compensate the victims of nuclear accidents³¹⁸. The other principles, as enumerated by the IAEA, regard the "limitation of liability in time", the "equal treatment of victims, irrespective of nationality, domicile or residence, provided that damage is suffered within the geographical scope of the Conventions", the "exclusive jurisdictional competence of the courts of the Contracting Party in whose territory the incident occurs or, in case of an incident outside the territories of Contracting Parties (in the course of transport of nuclear material), of the Contracting Party in whose territory the liable operator's installation is situated)", and "recognition and enforcement of final judgements rendered by the competent court in all Contracting Parties"³¹⁹.

In light of the development that followed the Chernobyl nuclear accident, it is possible to appreciate how drafters deemed those underlying principle appropriate, so that they maintained them as the basis of the liability regime. The only exception regards the limited amount of liability that was turned into unlimited liability both in the Vienna and Paris Convention in a way that will be described below.

5.1. Problems and developments concerning the Paris and Vienna Conventions.

³¹⁶ Ibid., p. 39

³¹⁷ Ibid.

³¹⁸ Ibid.

³¹⁹ Ibid.

Before the amendments adopted in the aftermath of the Chernobyl accident, the liability system created by the Paris and Vienna Conventions was characterized by a major problem: the limitation in the territorial scope. Indeed, each Convention was applicable only with respect to Contracting Parties nationals and territories while it did not apply to accidents originating from within the borders of non-Contracting Parties or to the damage suffered from non-Contracting States unless the Installation States decided otherwise. This is problematic if we consider that those States that were Contracting Parties to the Vienna Convention were non-Contracting Parties to the Paris convention and vice versa, and no link existed between the two instruments³²⁰. This incongruence was solve in 1888 when, in the aftermath of the Chernobyl accident, it was clear that such an arrangement would cause practical and legal injustices and the Joint Protocol was adopted to connect the two Conventions, so as to create a unified system. The Joint Protocol, provides that “the operator of a nuclear installation situated in the territory of a Party to the Vienna Convention shall be liable in accordance with that Convention for nuclear damage suffered in the territory of a Party to both the Paris Convention and this Protocol” (Article II) and vice versa. Therefore, if for instance a nuclear accident occurs within the territory of a Contracting Party to the Vienna Convention, the victims of the impact of such accident in Contracting States to the Paris Convention are treated in the same way as victims in Vienna States. However, the Joint Protocol only created a bridge between the two Convention without changing any of the provisions contained in the respective texts, since any modification would have required a formal amendment. As a consequence, the Joint Protocol respected the restricted territorial scope of both Conventions which means that non-Contracting States of both Conventions were excluded from the liability system constituted by the Vienna Convention, Paris Convention and Joint protocol.

The problem of the restricted territorial scope was solved, with regard to the Vienna Convention with the 1997 protocol. Article 1A provides that “this Convention shall apply to nuclear damage wherever suffered”. However, pursuant to paragraph 2 “the legislation of the Installation State may exclude from the application of this Convention damage suffered - (a) in the territory of a non-Contracting State; or (b) in any maritime zones established by a non-Contracting State in accordance with the international law of the sea”. Such exclusion can only be applied “in respect of a non-Contracting State which at the time of the incident - (a) has a nuclear installation in its territory or in any maritime zones established by it in accordance with the international law of the sea; and (b)

³²⁰ Lammers J. G. (2001). ‘International Responsibility and Liability For Damage Caused by Environmental Interferences’, in *Environmental Policy and Law*, Vol. 31, No.2.

does not afford equivalent reciprocal benefits” (Article 1A (3)). Concerning the Paris Convention, it was revised in such a way that, in practice, its territorial scope is comparable to the Vienna one, though the amended Article 2 is structured in a different way and provides for a list of the instances in which the Convention is applicable³²¹. As a consequence of these amendments, victims of nuclear accidents can receive compensation for the damage suffered regardless of the fact that their State is a Contracting Party to either convention, so they can take advantage of their dispositions in a similar fashion as victims in Contracting States.

A second shortcoming of the pre-Chernobyl liability regime that emerged after the accident concerns the concept of damage³²². Damage before the starting of both conventions amendment process included “loss of life, any personal injury or any loss of, or damage to, property which arises out of or results from the radioactive properties” (Article 1 (k) (i) of the Vienna Convention; the Paris convention applied to the same circumstances though a definition of damage was not explicitly present). The dramatic consequences of the 1986 nuclear accident underlined how damage was not limited to those elements. Consequently the scope of the Conventions was significantly enlarged to include first of all environmental damage and economic loss directly deriving from the radiation dispersion (e.g. farmers that could not sell fruits or vegetables because of the contamination risk or the tourism sector that was dramatically hit in the areas especially affected by the radioactive plume because of the fear of radiations). Regarding environmental damage, it must be said that it was not an easy issue to be dealt with because it is not a simple task to define what is specifically meant by environment, the specific extent to which the environment is damaged by radiations and to quantify the damage in order to make it compensable³²³. Moreover, if on the one hand the general polluter-pays principle in environmental law has acquired the status of customary law and requires anyone that has caused environmental damage to take appropriate measure to remedy it, the concept of liability is based on the harm that is precisely suffered by an individual and the damage must be tangibly demonstratable. The definition of damage which resulted from the amendment procedures and contained in Article I(k) of the Vienna Convention and Article 1(vii) of the Paris Convention contains reference to “loss of life or personal injury”, “loss or damage to property”, “economic loss arising from loss or damage, the costs of measures of reinstatement of impaired environment,

³²¹ Pelzer N. (2006). ‘Learning the hard way: did the lessons taught by the Chernobyl nuclear accident contribute to improving nuclear law?’, in IAEA-NEA, *International nuclear law in the post-Chernobyl period*, p. 104.

³²² McRae B. (2006). ‘The Compensation Convention: Path to a Global Regime for Dealing with Legal Liability and Compensation for Nuclear Damage’, in IAEA-NEA, *International nuclear law in the post-Chernobyl period*.

³²³ Pelzer N. (2006). ‘Learning the hard way: did the lessons taught by the Chernobyl nuclear accident contribute to improving nuclear law?’, in IAEA-NEA, *International nuclear law in the post-Chernobyl period*, p. 105.

unless such impairment is insignificant”, “loss of income deriving from an economic interest in any use or enjoyment of the environment, incurred as a result of a significant impairment of that environment”, “the costs of preventive measures, and further loss or damage caused by such measures”, and “any other economic loss, other than any caused by the impairment of the environment, if permitted by the general law on civil liability of the competent court”³²⁴. Therefore, as far as environmental damage is concerned, it can be said that a compromise was reached in order to avoid the complexities and also a rather vagueness of the concept (e.g. who has the right to claim compensation for environmental loss? What is it meant with the term environment? How can environmental damage be expressed in monetary terms?), envisaging a narrower concept of environmental damage: it can be compensable to the extent that it caused economic loss to individuals³²⁵.

A third problem concerned the liability amounts. The Chernobyl accident clearly demonstrated that the amounts provided by the liability Conventions and domestic law would be inadequate to compensate the damage³²⁶. For this reason the amendments to both conventions considerably increased the minimum binding level of liability. However, at the time of the nuclear catastrophe a conceptual discussion emerged. As Pelzer points out, it is widely believed that civil liability should offer compensation so as to cover entirely the risks linked to a specific activity³²⁷. If, on the one hand, this may be correct, on the other hand, disasters like the Chernobyl nuclear accidents are fully-fledged international catastrophes and civil liability is not adequate to cope with their magnitude since insurance and other assets are not enough to cover the damage deriving from them. Thus, when there is a man-made disaster or catastrophe the Installation State is compelled to intervene and provide adequate funds when those of the operator are exhausted. After all, it is the State that issues licenses for nuclear activities and retain the responsibility to guarantee that such licenses are respected and that the safety of activities is maintained at the highest level.

5.2. International supplementary compensation with public funds.

³²⁴ Entries taken from Article 1 (2) (k) of the Vienna Convention. Provisions in the Paris convention are identical in substance.

³²⁵ Pelzer N. (2006). ‘Learning the hard way: did the lessons taught by the Chernobyl nuclear accident contribute to improving nuclear law?’, in IAEA-NEA, *International nuclear law in the post-Chernobyl period*, p. 105

³²⁶ Schwartz J. (2006). ‘International Nuclear Third Party Liability Law: Response to Chernobyl’, in IAEA-NEA, *International nuclear law in the post-Chernobyl period*.

³²⁷ Pelzer N. (2006). ‘Learning the hard way: did the lessons taught by the Chernobyl nuclear accident contribute to improving nuclear law?’, in IAEA-NEA, *International nuclear law in the post-Chernobyl period*, p.105-110

In order to address more effectively the issue of liability amounts beyond the increase in compensation minimum limits in the Vienna and Paris Convention, States introduced a system of supplementary international public funds to be collected both from Installation States and non-nuclear States. The latter should provide funds as a matter of solidarity for the victims of nuclear catastrophes, even though non-nuclear and especially anti-nuclear States might not share this sentiment of solidarity with Installation States. Nevertheless, if not for solidarity, there are other compelling reasons for non-nuclear States to adhere to such system: if people impacted by nuclear accidents do not receive adequate or any form of compensation, “a political destabilization of the respective country or region may be the consequence, which is in nobody’s interest”³²⁸. This system is incorporated in the Brussel Convention Supplementary to the Paris Convention that establish three compensation levels or tiers: in case of a nuclear accident, first of all the operator’s funds are mobilized, when they are exhausted, the Installation State intervenes providing domestic public funds, and finally international public funds are provided by all Contracting Parties³²⁹. As far as the Vienna Convention is concerned, Contracting Parties tried to initiate talks on the development of an instrument similar to the Brussel Convention but their proved partially fruitless. Partially because of the fact that the establishment of a system of supplementary compensation that could imitate the Paris-Brussel one could not emerge, discussions went on and the introduction of a US proposal led to the creation of the Convention on Supplementary Compensation for Nuclear Damage that is not attached to the Vienna Convention: it is an independent instrument in its own right³³⁰. Differently from the Brussel Convention, it provides for two tier of compensation: the first one to be made available by the Installation State, and the second made of international public funds to be supplied by Contracting Parties according to a complex formula for which the great majority of international funds (more than 90%) are to be made available by nuclear States³³¹. The Convention was drafted in a way to incentivize participation from both nuclear and non-nuclear States. On the one hand, Article IV (1) (c) provides for a maximum contribution for nuclear States that, as just stated, are those which are asked to provide the greatest share of international funds, so the fact of establishing limits reassured them; on the other hand, non-nuclear States participation

³²⁸ Ibid., p.108.

³²⁹ NEA (n.d.). *Brussels Supplementary Convention to the Paris Convention (Brussels Supplementary Convention or BSC)*. Available at: https://www.oecd-nea.org/jcms/pl_20318/brussels-supplementary-convention-to-the-paris-convention-brussels-supplementary-convention-or-bsc (accessed: 20 January 2021).

³³⁰ Pelzer N. (2006). ‘Learning the hard way: did the lessons taught by the Chernobyl nuclear accident contribute to improving nuclear law?’, in IAEA-NEA, *International nuclear law in the post-Chernobyl period*, p.109.

³³¹ Ibid.

is incentivized thanks to the manner in which the distribution of compensation funds in case of nuclear accidents is established. Indeed Article XI (1) states that

The funds provided under Article III. 1(b) shall be distributed as follows: (a) 50% of the funds shall be available to compensate claims for nuclear damage suffered in or outside the Installation State; (b) 50% of the funds shall be available to compensate claims for nuclear damage suffered outside the territory of the Installation State to the extent that such claims are uncompensated under sub-paragraph (a).

This distribution was included as a way to signal the international community importance and attention that is directed to the transboundary impact of nuclear accidents. At the same time, Pelzer points out how the Convention has some major drawbacks³³². First of all, several nuclear States have demonstrated their reluctance to join the Convention because of the interpretation of the funds distribution as discriminatory, favoring victims “outside the territory of the Installation State”³³³. Second, and maybe most importantly, the Convention establish only two tiers of compensation. Many States, especially those with nuclear programmes which are obliged to contribute for more than 90% of the funds of the second tier, question the lack of an intermediate tier based exclusively on the disbursement of the tax money by the Installation State in which the accident occurred, following the structure of the Brussel Supplementary Convention. They argue that Installation States must be responsible for the establishment and maintenance of nuclear safety, so it is appropriate that the Installation State respond when the operator’s tier is exhausted, and only in third place tax payer money from other States are mobilized. For this reason, the Convention did not attract much participation and it only entered into force in 2015. To the extent that the amount of funds available in the second tier are dependent on the number of Contracting Parties (Article 3), it is clear how participation is of fundamental importance.

5.3. Conflict of regimes and final remarks.

In light of the previous discussion, it is undisputed that relevant progress was achieved in the field of civil liability following the Chernobyl nuclear accident. With the introduction of the Joint Protocol and of the Convention on Supplementary Compensation for Nuclear Damage, however, two parallel

³³² Ibid., pp.108-115.

³³³ Ibid., p.111.

liability regimes came to life: the triad Paris Convention, Vienna Convention and Joint Protocol on the one hand and Convention on Supplementary Compensation on the other. Therefore, qualitative progress was achieved but it was accompanied by an increasing number of instruments that is not necessarily a positive outcome, particularly if these instruments deal with the same issues, so they are in competition with each other³³⁴. The good functioning and effectiveness of an international liability regime, especially in case of nuclear accidents that have a potential far-reaching transboundary impact, is based on a comprehensive, unified and widely-adopted framework. The presence of two potentially competing regimes can therefore create a detrimental bifurcation, recreating a situation similar to the pre-Joint Protocol arrangement. It has to be noted that the greatest nuclear power (considering the number of operative reactors³³⁵) in the world, the United States, is a contracting Party only to the Convention on Supplementary Compensation for Nuclear Damage because it allowed it to join without changing its domestic laws on nuclear liability. It follows that a nuclear liability regime (the Paris-Vienna-Brussel) without the main world's nuclear power suffers from a major shortcoming. In conclusion, it can be said that both regimes are imperfect (though the contribution of the post-Chernobyl amendments and progresses does not have to be overlooked) and the presence of two parallel systems does not help in the consolidation of a unified, comprehensive and solid regime.

An important consideration which concerns all the three instruments – the Vienna Convention, the Paris Convention and the Convention on supplementary compensation – is that they contain a provision stating that “Except in so far as the law of the Installation State may provide the contrary, the operator shall not be liable for nuclear damage caused by a nuclear incident directly due to a grave natural disaster of an exceptional character”³³⁶. In light of the fact that extreme natural events due to climate change, are supposed to become the main cause of radiological emergencies, this dispositions makes the liability regime inadequate to meet the challenges of the future. This provision is implicitly linked to the idea of *force majeure*, which is intended as “the occurrence of an irresistible force or of an unforeseen event, beyond the control of the State, making it materially impossible in the circumstances to perform the obligation”³³⁷. Now, considering the provision of the

³³⁴ Pelzer N. (2006). ‘Learning the hard way: did the lessons taught by the Chernobyl nuclear accident contribute to improving nuclear law?’, in IAEA-NEA, *International nuclear law in the post-Chernobyl period*, p. 112

³³⁵ McCarthy N. (2020). *The Countries with the Most Nuclear Reactors*. Available at: <https://www.statista.com/chart/20750/number-of-operational-reactor-units-by-country/> (access: 3 February 2021)

³³⁶ Article 4 (3) (b) of the Vienna Convention, Article 3 (5) (b) of the Convention on Supplementary Compensation for Nuclear Damage. Article 9 of the Paris Convention as a different wording but the substance is exactly the same.

³³⁷ ILC (2001). Draft Articles on Responsibility of States for Internationally Wrongful Acts.

liability conventions in conjunction with the definition of force majeure, to what extent can natural disasters be considered completely unforeseen? Today we possess state-of-the-art technical tools to make accurate predictions based on models and data series on the evolution and possible consequences of climate change and other natural events. This state of affairs should lead to a strengthening of nuclear safety measures, as a matter of precaution, based on worst case scenarios, something that is not usually done because of economic reasons, as the Fukushima case testified. This opens up a clear but problematic link between natural disasters and nuclear liability, and nuclear safety. How is it possible to demonstrate whether an event was really unpredictable or whether a nuclear accident was avoidable because caused by negligence, not sufficiently accurate studies on likely extreme events and subsequent poorly developed safety plans? At the same time there is another fundamental aspect to take into consideration, namely that of considering to what extent the safety of nuclear installations can be improved to address the threat of extreme natural events. This consideration leads to another major question: if more and more extreme events increasingly jeopardize the safety of nuclear installations, precautionary measures cannot ensure adequate protection and liability is excluded, is it still possible to assume that there is a balance between risks and benefits arising from the production of nuclear energy?

Finally, it is worth adding a final remark regarding an inherent difficulty in obtaining compensation for “loss of life or personal injury”. In order to obtain compensation for damage, it is necessary to prove the presence of an undisputed causal link between the damage suffered and, in this case, the nuclear accident. Now, apart from relatively few cases of acute radiation syndrome³³⁸, whose symptoms are readily diagnosed, the consequences of the exposition to lower doses of radiations, which is the situation of the majority of the population interested by radioactive plumes, are still source of high debate among scientists, biologists and physicians. Indeed, taking the Chernobyl case, on the one hand there seems to be compelling epidemiological data that reveal a significant increase in specific diseases in the years following the Chernobyl nuclear accident in the populations hit by the radioactive fallout also outside Russia, Belarus and Ukraine³³⁹, while other reports, including the official ones, tend to be much more skeptical about the incidence of radiation doses

³³⁸ “Acute Radiation Syndrome (ARS) (sometimes known as radiation toxicity or radiation sickness) is an acute illness caused by irradiation of the entire body (or most of the body) by a high dose of penetrating radiation in a very short period of time (usually a matter of minutes)”. Centers for Disease Control and Prevention. (2018). *Acute Radiation Syndrome: a Fact sheet for Clinicians*. Available at:

<https://www.cdc.gov/nceh/radiation/emergencies/arsphysicianfactsheet.htm> (accessed: 3 February 2021)

³³⁹ See Yablokov A. V., Nesterenko V. B., Nesterenko A. V. (2010). *Chernobyl: Consequences of the Catastrophe for People and the Environment*. Boston: Blackwell.

in the insurgence of illnesses and attribute the increase to the higher amount of exams and screenings³⁴⁰.

Anyway, it is very difficult, if not impossible to prove the link between the exposure to low doses of radiations caused by the accident and the insurgence of a specific illness. Moreover, even if it was possible to show the presence of a causal link between the release of radiation and an illness, it is necessary to consider the so called latency-period which the time span between the exposure to a radioactive source and the actual insurgence of an illness caused by it³⁴¹. “The latency period for induction of leukemia is 5–7 years, and for solid tumors is at least 10 years, so cancers occurring earlier than this should be considered to be naturally occurring rather than induced by radiation exposure”³⁴². Since instruments on civil liability for nuclear damage are based on the limitation of liability in time which means that generally there is a 10 years’ time for filing a claim for compensation, also providing for the possibility of showing a causal link, the period of latency for several illnesses prevents the grant of compensation for “loss of life or personal injury”.

6. Conclusive considerations on International Nuclear Law.

As demonstrated, the Chernobyl nuclear accident incentivized international discussions on the peaceful use of nuclear energy and gave rise to a process of revision and development of international binding conventions with the aim of effectively strengthening the international nuclear regime. Even though outside the scope of this Chapter, it has to be pointed out that attention was not devoted only to the development of binding treaties but the consequences of the accident triggered the establishment, re-examination and updating of a broad set of soft law instruments in all the different fields of nuclear law examined above. They are important because they provide fundamental guidance on practices, especially in the context of nuclear safety and security where they complement the binding instruments that are characterized by a framework structure due to the highly technical nature of the fields that require continuous updates.

All in all, it can be said the legal framework for the peaceful use of nuclear energy is comprehensive and well-defined, but at the same time it is a highly technical and specialized field of International

³⁴⁰ See IAEA – the Chernobyl Forum: 2003-2005. (2006). *Chernobyl’s legacy: health, environmental and socio-economic impacts and recommendations to the governments of Belarus, the Russia Federation and Ukraine*. Vienna:IAEA.

³⁴¹ National Cancer Institute. (n.d.). *Latency period*. Available at: <https://www.cancer.gov/publications/dictionaries/cancer-terms/def/latency-period> (accessed: 6 February 2021)

³⁴² Fraser D. K. (2011). ‘Latency period for radiation-induced cancer’, in *Canadian Medical Association Journal*, Vol.183, No. 17, p.2017.

law and it is narrowly-construed in the sense that it regulates activities and occurrences that turn around nuclear facilities and nuclear materials, but apart from civil liability it does not tackle the social and humanitarian consequences of nuclear disasters. For this reason, considering the context of nuclear accidents, their management cannot be analyzed just looking at International Nuclear Law, but especially if we turn to the humanitarian crisis that can emerge, the more general and non-issue-specific dispositions, instruments and principles of IDRL and human rights law provide the main guidance for effective and prompt action.

In brief, nuclear accidents are one of the most complex disasters that can occur for the magnitude and extensiveness of their impact as well as the technical and specialized knowledge and expertise that is required to manage them effectively. As a consequence, International Nuclear Law intervenes in the establishment of technical and practical obligations whose effectiveness is vital for the prevention or minimization of the radiological contamination, but, in the event of disasters, they must be considered within a much broader set of principles and obligations, especially pertaining to the fields of IDRL, Human Rights Law and Environmental Law.

Chapter 3

The legacy of the two INES³⁴³ Level 7 nuclear accidents: State Responsibility and impact of Chernobyl and Fukushima on International Nuclear Law and Disaster Response Law.

1. Responsibility for and consequences of the nuclear accident at the reactor n.4 of the Chernobyl NPP.

On 26 of April 1986, the world witnessed the worst nuclear accident in the history of nuclear power. The core of the reactor n.4 of the Chernobyl nuclear power plant melted down as a consequence of a badly managed test coupled with reactors technical flaws. The power plant employees committed a series of involuntary mistakes and violations of the test procedures; as Muellner describes, the employees in the control room who carried out the test did not pay attention to fundamental parameters which, if checked, would have indicated that the reactor was too instable to go ahead with the tests, thus averting the accident; moreover, they breached some procedures that modified the test conditions, increasing the dangers and risks of a safety test which was already risky *per se* since it implied the deactivation of safety mechanisms³⁴⁴. They acted in such a reckless manner in part because of their lack of knowledge about the seriousness of their actions and significance of the parameters they overlooked, which, in the aftermath of the accident, triggered a fundamental debate on the so-called safety culture. The other fatal component of the accident was the poor design of the RBMK reactors. As a consequence, the accident was due to both human and technical causes.

The ill-fated actions of the control room crew led to the accumulation of xenon in the reactor and to the increase in the steam pressure. This pressure was so high that it ultimately tore the reactor top, and when this happened, oxygen came in and when it entered into contact with hydrogen it triggered an explosion and a fire that freed lethal particles of radioactive material into the atmosphere. Transported by the wind, these particles spread thousands of kilometers always from

³⁴³ INES is an acronym standing for International Nuclear and Radiological Event Scale. Developed by the IAEA and NEA, it was introduced in 1990 to rate “events that result in a release of radioactive material into the environment and in the radiation exposure of workers and the public. It is also used for events that have no actual consequences but where the measures put in place to prevent them did not function as intended”. See IAEA (n.d.). *International Nuclear and Radiological Event Scale (INES)*. Available at: <https://www.iaea.org/resources/databases/international-nuclear-and-radiological-event-scale> (accessed: 15 February 2021).

³⁴⁴ See Muellner N. (2019). ‘Three Decades after Chernobyl: Tehnical or Human Causes?’, In: Haas R., Mez L., Ajanovic A. (eds) *The Technological and Economic Future of Nuclear Power*. Energiepolitik und Klimaschutz. Energy Policy and Climate Protection, Wiesbaden: Springer VS.

the nuclear power plant, heavily poisoning large parts of the European continent; however, radioactive particles were transported as far as North America, Arctic and Antarctic regions, Northern Africa and also remote Pacific and Indian Oceans islands³⁴⁵, causing serious problems both to the population and the environment.

The physical but also the psychological impact of the accident on the population led decision-makers to start a deep process of revision about the norms that regulated the production of nuclear energy which ultimately led to the previously-described advances in nuclear law. However, there are other three main aspects that are worth being analyzed regarding the Chernobyl accidents: the Soviet Union possible international responsibility, the emergence of the new concept of safety culture and the consolidation of the obligation of notification as customary law.

1.1. State Responsibility: did Soviet State authorities play a role in triggering the disaster?

According to the Draft Articles on the Responsibility of the State for Internationally Wrongful acts, adopted by the ILC in 2001, “[e]very internationally wrongful act of a State entails the international responsibility of that State” (Article 1) and “[t]here is an internationally wrongful act of a State when conduct consisting of an action or omission: (a) is attributable to the State under international law; and (b) constitutes a breach of an international obligation of the State” (Article 2). As a consequence, in order to assess whether the Soviet Union could be held internationally responsible for the Chernobyl nuclear accident it is necessary to see if these two requirements are respected. Before delving into the analysis of the possible responsibility of the URSS, it is worth recalling that in 1986 the majority of binding instruments pertaining to the field of IDRL and International Nuclear Law were not in place yet. The only international treaty apparently applicable which was in force at the time and that had been ratified by the Soviet Union is the Convention on Long-Range Transboundary Air Pollution, but according to the interpretation of many, transboundary pollution from radioactive particles was excluded from the scope of application of the convention at the time of the accident³⁴⁶. As a consequence, several aspects of the accident which today would constitute a breach of an international obligation and lead to the international responsibility of the State cannot be invoked (e.g. the obligation of notification), including all the treaty obligations described in the

³⁴⁵ Yablokov A. V., Nesterenko V. B., Nesterenko A. V. (2010) *Chernobyl: Consequences of the Catastrophe for People and the Environment*. Boston: Blackwell, pp. 5-17.

³⁴⁶ See Sand P. H., Wiener J. B. (2016), ‘Towards a New International Law of the Atmosphere?’, in *Goettingen Journal of International Law*, Vol. 2, pp. 217-218.

previous chapter, unless they codify previously-existing customary principles. Indeed, those instruments were developed exactly out of the acknowledgement that States did not have but few clear obligations in the field of the civil production of nuclear energy, most of them pertaining to more general principles of customary law.

In order to assess the Soviet Union responsibility for the Chernobyl nuclear accident, it is useful to start from the principle of State Sovereignty. The Swiss arbitrator Max Huber, in the *Island of Palm Case* (1928) argued that

Sovereignty in the relations between States signifies independence; Independence in regard to a portion of the globe is the right to exercise therein, to the exclusion of any other State, the functions of a State. The development of the national organization of States during the last few centuries and, as a corollary, the development of international law, have established this principle of the exclusive competence of the State in regard to its own territory in such a way as to make it the point of departure in settling most questions that concern international relations.

The most important part for the present discussion is the statement that State Sovereignty implies the presence of “exclusive competence of the State in regard to its own territory”. A natural consequence of this is that States possess the exclusive power “to develop all branches of state government without external interference. Thus, no state may interfere with the Soviet Union's power to regulate and control its own nuclear energy industry”³⁴⁷. Of course, the meaning and implications of State Sovereignty was considered in many judicial cases and instruments including the UN Charter, which made the concept one of its foundational elements, the PCIJ *Lotus case* (1927), the ICJ *Corfu Channel case* (1949), Declaration on Principles of International Law Friendly Relations and Co-Operation Among States in Accordance with the Charter of the United Nations, and several others. They all stress the territorial scope of State Sovereignty that is fundamental because it implies, on the one hand, that any State has the right to choose its economic, political, cultural and social system without any external interference³⁴⁸, but, on the other hand, the territorial scope implies a limitation that leads to the fact that every States has the right not be subject to any outside interference which means that every State has freedom of action within its

³⁴⁷ Hartke V. R. (1987). ‘The International Fallout from Chernobyl’, in *Dickinson Journal of International Law*, Vol. 5, No. 2, p.322.

³⁴⁸ UNGA (1970). Declaration on Principles of International Law Friendly Relations and Co-operation among States in Accordance with the Charter of the United Nations, A/RES/25/2625.

borders, but this freedom stops when it clashes with other States' rights and freedoms³⁴⁹. So, there is a theory of limited territorial sovereignty. The application of this fundamental principle to radioactive pollution or, more generally, to any other form of contamination, implies that States are allowed to undertake whatever kind of legal activity within their borders, but on condition that this does not cause damage to other countries, a principle summarized in the already-mentioned Latin brocardo *sic utere tuo ut alienum non laedas*. This corresponds to the idea behind the customary principle³⁵⁰ of good neighborhood or no harm that make States responsible for the transboundary impact of their domestic activities. In addition, it has been widely recognized that States are under the obligation to ensure that their territories are not utilized by *any* subject under their jurisdiction for activities that might be injurious for other States³⁵¹.

The good neighborhood principle is a principle of due diligence³⁵². Due diligence is an obligation of conduct, meaning that the State has the obligation "to take prevention or minimization measures"³⁵³ to the maximum extent possible, but there is not an obligation of result, namely "to guarantee that significant harm is totally prevented, if it is not possible to do so"³⁵⁴. Thus, the principle of no harm implies a strong focus on prevention: under the obligation of due diligence States shall take all adequate and necessary measures "to prevent significant transboundary harm"³⁵⁵. Regarding the assessment of the degree of due diligence that is to be applied by States, as the ILC claimed in its commentaries to Draft articles on Prevention of Transboundary Harm from Hazardous Activities, "[it] is generally considered to be appropriate and proportional to the degree of risk of transboundary harm in the particular instance. For example, activities which may be considered ultrahazardous require a much higher standard of care"³⁵⁶. In light of the need to assess URSS responsibility for the Chernobyl accident, it is important to note that, back in 1963, Mr. R. Ago,

³⁴⁹ Hartke V. R. (1987). 'The International Fallout from Chernobyl', in *Dickinson Journal of International Law*, Vol. 5, No. 2, p.323.

³⁵⁰ The customary nature of the no-harm principle can be traced back to the Trail Smelter arbitration in that the tribunal held that "under the principles of international law [emphasis added...] no State has the right to use or permit the use of its territory in such a manner as to cause injury [...] in or to the territory of another or the properties or persons therein", and more explicitly, though after the Chernobyl disaster, in the 1996 ICJ Advisory Opinion on the Legality of the Threat or Use of Nuclear Weapons when the Court asserted that "[t]he existence of the general obligation of States to ensure that activities within their jurisdiction and control respect the environment of other States or of areas beyond national control is now part of the corpus of international law relating to the environment".

³⁵¹ *Ibid.*, p. 325.

³⁵² Garg R. (ed.). (2021). *Analysis of due diligence and their need for international law and conventions*. Available at: <https://blog.ipleaders.in/analysis-due-diligence-need-international-law-conventions/> (accessed: 20 February 2021)

³⁵³ ILC (2001). Draft articles on Prevention of Transboundary Harm from Hazardous Activities, with commentaries, p.154, para 7.

³⁵⁴ *Ibid.*

³⁵⁵ *Ibid.*, para 10.

³⁵⁶ *Ibid.*, para 11.

Chairman of the Sub-Committee on State Responsibility, in his report on the topic, assumed that “[...]the State incurs international responsibility for an injury caused by the act of an individual if it does not exercise due diligence to prevent such an action”³⁵⁷.

Going back to the specific content of the no-harm or good neighborhood principle, this topic was tackled in two groundbreaking judgements before the Chernobyl accident: the ICJ judgement on the Corfu Channel Case, and the Trail Smelter Arbitration. In the former, the ICJ asserted that “every State’s obligation not to allow knowingly its territory to be used for acts contrary to the rights of other States”³⁵⁸. Similarly, arbitrators in the Trail Smelter Case held that Canada was “responsible in international law for the conduct of the Trail Smelter”³⁵⁹ since it is a duty incumbent on Canada to guarantee that the conduct of all those under its jurisdiction is “in conformity with the obligations [of the State] under international law [...]”³⁶⁰. Moreover, an important point was added in the Trail Smelter judgement: for the responsibility of the State to arise for transboundary pollution, there must be a *demonstratable* damage suffered by another State or by individuals or properties under its jurisdiction.

Additionally, in the field of nuclear law, though not in the realm of the peaceful application of atomic energy, the principle of no-harm was clearly spelt out in Article 1 of the Nuclear Test-Ban Treaty; it provides that

Each of the Parties to this Treaty undertakes to prohibit, to prevent, and not to carry out any nuclear weapon test explosion, or any other nuclear explosion, at any place under its jurisdiction or control, [... and] in any other environment if such explosion causes radioactive debris to be present outside the territorial limits of the State under whose jurisdiction or control such explosion is conducted.

Finally³⁶¹, all the points, or better facets, that have been considered above about the boundaries of States responsibility for transboundary harm and, consequently, the no-harm principle, were put

³⁵⁷ Ago R. (1963). Report by Mr. Roberto Ago, Chairman of the Sub-Committee on State Responsibility, Document A/CN.4/152, p.249, para 12.

³⁵⁸ ICJ (1949). Corfu Channel (United Kingdom of Great Britain and Northern Ireland v. Albania), p.22.

³⁵⁹ Reports of International Arbitral Awards – Trail Smelter Case (United States, Canada), 16 April 1938 and 11 March 1941, Volume III, p. 1965.

³⁶⁰ *Ibid.*, p. 1966.

³⁶¹ Since the purpose is to discuss the responsibility of the Soviet Union for the Chernobyl nuclear accident of 1986, only instruments that were adopted prior the disaster will be mentioned. Of course, considering the topic of responsibility for transboundary harm, also in relation to nuclear activities, there would be other fundamental instruments to mention, including the ICJ Advisory Opinion on the Legality of the Threat or the Use of Nuclear Weapons.

together and reiterated in the UN Declaration on the Human environment adopted at the UN Conference on the Human Environment, held in Stockholm in 1972, in Principle 21, which provides that “States have the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction”³⁶².

Considering what has been said so far, the Soviet Union could be held responsible for the Chernobyl nuclear accident and its ensuing consequences if the disaster is considered to be an act “contrary to the rights of other States” and the URSS knew and permitted its territory to be used for such activities, as spelt out in the Corfu Channel case, thus failing to apply due diligence. Regarding the first point, it can be said that every State has the right and the obligation to keep the environment healthy, also due to the presence of a duty to protect those individuals under its jurisdiction and that are likely to be adversely affected by environmental problems. As a consequence, the transboundary impact of the nuclear accident clashes with the rights of other countries. Second, the URSS had to be aware of the fact that its territory was used for activities potentially injurious for other States. Here, there is no doubt: first, of all Soviet’s nuclear power plants were not managed by private operators but they were State properties managed by State authorities. Hence, the Soviet Union was aware of the tests that were periodically done since they were approved by State authorities³⁶³. Moreover, prior to the accident, the international community and Soviet experts had already criticized the poor safety standards in terms of structure and design of Soviet reactors: they were characterized by the lack of containment constructions, a backward reactor design, an unproper and dangerous design of the reactor control rods which can be listed among the main causes of the accident, and deficiencies in the cooling system³⁶⁴. These features were well-known to Soviet authorities but nothing was done to update and upgrade the power plants including the Chernobyl one³⁶⁵, which constitute a wrongful omission, since it contributed to lead to the aforementioned consequences in terms of violation of other States’ rights and no-harm principle.

³⁶² UN (1972). Report of the United Nations Conference on the Human Environment, Stockholm 5-16 June 1972.

³⁶³ Hartke V. R. (1987). ‘The International Fallout from Chernobyl’, in *Dickinson Journal of International Law*, Vol. 5, No. 2, p.328.

³⁶⁴ Muellner N. (2019). ‘Three Decades after Chernobyl: technical or Human Causes?’, In: Haas R., Mez L., Ajanovic A. (eds) *The Technological and Economic Future of Nuclear Power. Energiepolitik und Klimaschutz. Energy Policy and Climate Protection*, Wiesbaden: Springer VS.

³⁶⁵ Hartke V. R. (1987). ‘The International Fallout from Chernobyl’, in *Dickinson Journal of International Law*, Vol. 5, No. 2, p.329.

Technical and structural deficiencies contributed to cause the accident but there were also human mistakes. The Draft Articles on the Responsibility of the States, as noted before, affirm that States are responsible for acts or omissions attributable to the State; it follows that they are not internationally responsible for the acts of private individuals. Human mistakes concern actions undertaken during the carry-out of the test, the most important of which consisted in the deactivation of the emergency cooling system that constitutes a clear infringement of safety protocols in the URSS³⁶⁶. This is exemplary to shows how no precautionary measure was taken that could be used as a safety lifeline. As all binding legal instrument have then clearly stated, nuclear activities must be supervised by competent national authorities. These are all post-Chernobyl instruments, but, as Hartke points out, in the Soviet Union, at the time of the accident, there were several governmental agencies entrusted with the regulation of nuclear activities, also because the operation of nuclear power plant was state-led³⁶⁷. For this reason, the test that caused the reactor n.4 meltdown had to be authorized by competent authorities and also be subject to adequate supervision; evidence suggest that the test was not priorly revised by the plant managers charged with the maintenance of the installation safety, and proper authorization from regulatory agencies was not present. This means that “the agencies responsible for review and supervision did not fulfill their duties”³⁶⁸. Now, these agencies are organs of the State for all intent and purposes and, since “[t]he conduct of any State organ shall be considered an act of that State under international law”³⁶⁹, the Soviet Union can be held responsible for this. Again, the URSS was responsible of a negligent conduct and lack of due diligence.

As far as the supply of clear evidence of the presence of damage is concerned, environmental damage is easily demonstratable through the measurement of the radioactivity of the soil; other forms of damage including health problems and economic loss are less clearly showable because of the lack of an undisputed causal link, something that constitutes a very important barrier to justice and compensation. In this regard, the URSS claimed that the majority of economic loss was not an actual consequence of the nuclear accident but it was due to exaggerate precautionary measures undertaken by States, for whom the Soviets were not responsible³⁷⁰, thus refusing to answer to any

³⁶⁶ Malone L. A. (1987). ‘The Chernobyl Accident: a Case Study in International Law Regulating State Responsibility for Transboundary Nuclear Pollution’, in *Columbia Journal of Environmental Law*, Vol. 12, No. 203, p. 204.

³⁶⁷ Hartke V. R. (1987). ‘The International Fallout from Chernobyl’, in *Dickinson Journal of International Law*, Vol. 5, No. 2, pp.328-330.

³⁶⁸ *Ibid.*, p.330.

³⁶⁹ ILC (2001). Responsibility of States for Internationally Wrongful Acts, Article 4.

³⁷⁰ Malone L. A. (1987). ‘The Chernobyl Accident: a Case Study in International Law Regulating State Responsibility for Transboundary Nuclear Pollution’, in *Columbia Journal of Environmental Law*, Vol. 12, No. 203, p. 240.

claim for compensation. This assertion is disputable because anyway the application of precautionary measures seems to be an obligation under customary international law, and their implementation was directly caused by the accident, reasonable, proportionate and necessary if compared to the possible risks associated to radiations. In addition, Handl et al. claims that international customary law provides for the possibility of filing claims of reimbursement for the enactment of precautionary measures by affected States because, quoting Graefarth, “[i]t would simply not make any sense to expect a State to wait until further damage had occurred to claim an indemnification for losses instead of damages for necessary costs it has to bear in order to prevent losses which otherwise had to be expected”³⁷¹.

Up to now, considerations about the responsibility of the Soviet Union have been made taking an environmental perspective. However, it is also possible to carry out a human rights-based assessment. The International Covenant on Civil and Political Rights, at Article 2, provides that “[...]each State Party to the present Covenant undertakes to take the necessary steps, in accordance with its constitutional processes and with the provisions of the present Covenant, to adopt such laws or other measures as may be necessary to give effect to the rights recognized in the present Covenant”. In addition, in connection with Article 2, the Human Rights Committee recognized that “[t]here may be circumstances in which a failure to ensure Covenant rights as required by article 2 would give rise to violations by States Parties of those rights, as a result of States Parties’ permitting or failing to take appropriate measures or to exercise due diligence to prevent [...] the harm caused by such acts by private persons or entities”³⁷². Similarly, though in softer terms, the International Covenant on Economic, Social and Cultural Rights, at Article 2, states that “Each State Party to the present Covenant undertakes to take steps, individually and through international assistance and co-operation, [...] to the maximum of its available resources, with a view to achieving progressively the full realization of the rights recognized in the present Covenant by all appropriate means, including particularly the adoption of legislative measures”. The content of these two articles is replicated in all the most important human rights instruments and reflect the general fundamental obligation States have to take all necessary steps to respect, protect and fulfill human rights. The consequences of the accident in terms of violations of human rights will be the subject of the next chapter, thus there is no need to go in depth here. What must be underlined is that, in light of the

³⁷¹ Handl et al. (1987). ‘International Responsibility for Man-made Disasters’, in *American Society of International Law*, Vol.81, p. 335.

³⁷² Human Rights Committee (2004). General Comment No.31 – The Nature of the General Legal Obligation Imposed on States Parties to the Covenant. CCPR/C/21/Rev.1/Add. 1326 May 2004.

omissions, negligence and inaction of Soviet competent authorities in taking all necessary steps to ensure the highest possible level of nuclear safety, that, again, can be summarized in terms of a fundamental lack of due diligence, the URSS can be held responsible for the accident and the ensuing undisputable (at least in the majority of cases) violations of human rights. In addition, the two dimensions, the environmental and human rights one, are fundamentally linked. The international community has long recognized the implications of environmental degradation on the enjoyment of basic human rights, though still today “in spite of the wide recognition of its crucial importance, the right to a healthy environment has not yet been recognized as such”³⁷³. As a consequence, the environmental repercussions of Chernobyl accident, for which, in light of the reasoning above, the URSS can be held responsible, can amount to a deprivation of the enjoyment of fundamental human rights³⁷⁴. If a human rights approach is adopted, there is another aspect to point out: the obligation to protect human rights is an obligation *Erga Omnes*, so of course States could invoke the responsibility as particularly injured States for the violations of human rights that occurred in their territory as a consequence of the accident, but in case a clear link between the alleged violation of human rights in third countries and the release of radioactive particles from the Chernobyl facility was not demonstratable because of the lower levels of radioactivity, any State that had not suffered any kind of damage or harm, or cannot prove it, could anyway invoke the responsibility of the Soviet Union for the clear violations that occurred within the Soviet territory because of the *Erga Omnes* character of the obligations violated. Indeed, the respect and protection of human rights is an obligation States have and it is “owed to the international community as a whole” (Article 48 of the ILC Draft Articles on the Responsibility of the State for Internationally Wrongful Acts). In this sense, even if the States that invoke the responsibility did not suffer actual damage, there is a legal damage of the interests of all other States of the international community that want to see these norms of international law respected.

There is, however, a major problem linked to State responsibility and reparation: its enforcement. The main forum with which States can file claims against other States is the ICJ; nevertheless, the ICJ jurisdiction is fundamentally linked to States’ consent and the URSS had not given its consent to its jurisdiction. The same applies for arbitral tribunals. Resorting to the jurisdiction of domestic courts is impracticable as well because of the presence of procedural bars to jurisdiction in the form

³⁷³ OHCHR (n.d.). *Right to a Healthy and Sustainable Environment Report*. Available at: <https://www.ohchr.org/EN/Issues/Environment/SREnvironment/Pages/HealthySustainable.aspx> (accessed: 20 February 2021),

³⁷⁴ Malone L. A. (1987). ‘The Chernobyl Accident: a Case Study in International Law Regulating State Responsibility for Transboundary Nuclear Pollution’, in *Columbia Journal of Environmental Law*, Vol. 12, No. 203, p. 231.

of laws on State immunity which persist also in cases of gross violations of human rights, as demonstrated in Jurisdictional Immunities of the State case³⁷⁵.

This said, States refrained from trying to bring claims against the Soviet Union and invoking its responsibility. It is believed that the main reason for this was the concern for possible negative political repercussions. Indeed, Handl et al. argues that

some West European governments evidently were more concerned with securing Soviet cooperation in launching multilateral legislative initiatives for the prevention, mitigation and reparation of transboundary harm in future nuclear accidents than with obtaining compensation for economic losses ascribed to the fallout from the stricken Soviet reactor. Indeed, diplomatic insistence on Soviet liability and compensation well might have endangered prospects for Soviet concessions at the International Atomic Energy Agency (IAEA) conferences and meetings called to address the multilateral legislative agenda after Chernobyl³⁷⁶.

If the Soviet Union had been held responsible for the Chernobyl accident and its effects, specific consequences would have followed. The fact of identifying a States as responsible for the breach of international obligations implies the obligation to “(a) to cease that act, if it is continuing; (b) to offer appropriate assurances and guarantees of non-repetition, if circumstances so require”³⁷⁷. In addition, the Draft Articles provides that “[f]ull reparation for the injury caused by the internationally wrongful act shall take the form of restitution, compensation and satisfaction, either singly or in combination, in accordance with the provisions of this chapter”³⁷⁸ with the aim to “wipe out all the consequences of the illegal act and reestablish the situation which would, in all probability, have existed if that act had not been committed”³⁷⁹. Of course, in the case of Chernobyl nuclear accident, restitution would have been impossible because its impact and consequences, especially in the form environmental radioactive poisoning, and the health effects on the affected population, could not be “given back”. Thus, States should have sought compensation though the

³⁷⁵ See ICJ (2012). Jurisdictional Immunities of the State (Germany v. Italy: Greece intervening). The ICJ held that “[t]he question whether Germany still has a responsibility towards Italy, or individual Italians, in respect of war crimes and crimes against humanity committed by it during the Second World War does not affect Germany’s entitlement to immunity”.

³⁷⁶ Handl et al. (1987). ‘International Responsibility for Man-made Disasters’, in *American Society of International Law*, Vol.81, p.331.

³⁷⁷ ILC (2001). Responsibility of States for Internationally Wrongful Acts, Article 30.

³⁷⁸ ILC (2001). Responsibility of States for Internationally Wrongful Acts, Article 34.

³⁷⁹ PCIJ (1928). Factory at Chorzów Case (Merits), p.47

demonstration of the presence of a causal link between the accident and damage but it would have proven problematic.

Going back to the requirement of cessation and non-repetition of the wrongful act, what would have meant in this case? It would have meant the strengthening of the domestic legal framework on nuclear safety, and of the competence and attention of competent regulatory authorities, as well as the ensuing updating and upgrading of Soviet nuclear power plants. It is not possible to know what would have been done if the URSS responsibility had been ascertained, but the Soviets decided to re-activate reactor 1 and 2 in October at the Chernobyl NPP and many other RBMK-1000 reactors are still operative today which seems to constitute a clear lack of due diligence and respect of the preventive principle. Indeed, as noted before, many experts and the government itself claimed that the reactors RBMK suffered from intrinsic design flaws³⁸⁰, evidenced by the fact that only four years after the disaster at the reactor 4 there was another worrying accident at reactor 2³⁸¹. However, setting aside the issue of the Soviet responsibility, in order to ensure the non-repetition of similar disasters, the international community, under the auspices of the IAEA, undertook an exemplary process of revision and adoption of instruments in the field of nuclear law which included the drafting of the Convention on Nuclear Safety of which the Russian Federation is a Contracting Party. Now, since there are RBMK-1000 reactors, built in the 70s and 80s, that are still operational in territory of the Russian Federation³⁸², whose flaws persist because they are intrinsic in the design, it can be said that, to a certain extent, the framework structure of the Convention, coupled with its incentive character has certainly led to improvements but the path towards the attainment of the highest possible standards of nuclear safety is still long. This results clear especially if we consider the current state of affairs in light of the content of Article 6.

1.2. The concept of 'Safety Culture'.

The previous sections identified the main causes that led to the Chernobyl nuclear accident. They can all be attributed to a fundamental underlying source: an inherent lack of safety culture. Yet,

³⁸⁰ Hartke V. R. (1987). 'The International Fallout from Chernobyl', in *Dickinson Journal of International Law*, Vol. 5, No. 2.

³⁸¹ The Chernobyl Gallery (n.d.). *Timeline*. Available at: <http://www.chernobylgallery.com/chernobyl-disaster/timeline/> (accessed: 23 February 2021)

³⁸² World Nuclear Association (2021). *Nuclear power in Russia*. Available at: <https://www.world-nuclear.org/information-library/country-profiles/countries-o-s/russia-nuclear-power.aspx> (accessed: 24 February 2021).

what does safety culture refer to? The expression “safety culture” was brought in exactly in the aftermath of the Chernobyl nuclear accident by the International Nuclear Safety Advisory Group (INSAG) in its Summary Report on the Post-Accident Review Meeting on the Chernobyl Accident that pointed out how widespread attitudes, values, beliefs and perceptions within an organization can either foster or jeopardize the safety of performed activities³⁸³. From that moment, it became a pivotal notion in the international discourses on nuclear safety. According to Safety Series No.75-INSAG-4, “Safety Culture is that assembly of characteristics and attitudes in organizations and individuals which establishes that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance”³⁸⁴ while, before that, INSAG-3 had indicated that the concept “refers to the personal dedication and accountability of all individuals engaged in any activity which has a bearing on the safety of nuclear power plant”³⁸⁵.

The idea of Safety Culture originates from an essential acknowledgement, namely that “any problems arising at a nuclear plant originate in some way in human error”³⁸⁶. However, if on the one hand accidents and emergencies always have a human component, on the other hand the human mind is also the source of positive developments, in that it can detect and solve problematic situations. The concept of safety culture captures this duality: it aims at minimizing human errors by enhancing people’s practices and abilities; in brief, individuals are both, the cause and the solution to avoid nuclear accidents and safety culture has the purpose of elevating the beneficial side of human moves³⁸⁷. Therefore, it explicitly brings to the fore the paramount responsibility of individuals in the field of nuclear safety.

In this regard, one might be tempted to consider the issue of safety culture exclusively in relation to those individuals who materially work at the nuclear facilities. However, it is a much broader concept, characterized by different layers of responsibility in its promotion and establishment³⁸⁸. In order to appreciate this complexity, it is sufficient to look at all the diverse steps that actually lead to and are at the basis of the management of a nuclear power plant: it is designed, built and commissioned, its activities are generally guided and overlooked by domestic regulatory authorities, specifically directed by managers of the operating company and carried out by employees. All these

³⁸³ Morrow S. L., Koves G. K., Barnes V. E. (2014). ‘Exploring the relationship between safety culture and safety performance in U.S. nuclear power operations’, in *Safety Science*, Vol. 69, p. 37.

³⁸⁴ IAEA (1991). Safety Culture – a report by the International Nuclear Safety Advisory Group, Safety Series No.75_INSAG-4, p.1.

³⁸⁵ Ibid.

³⁸⁶ Ibid., p.3.

³⁸⁷ Ibid.

³⁸⁸ IAEA (2002). *Self-assessment of safety culture in nuclear installations, IAEA-TECDOC-1321*. Vienna:IAEA.

activities, that are both prescriptive and practical, intervene in the definition of a sound safety culture³⁸⁹. The fact that of arguing that safety culture has both a prescriptive and practical side means that it composed of two essential elements: “[t]he first is the necessary frame- work within an organization and is the responsibility of the management hierarchy. The second is the attitude of staff at all levels in responding to and benefiting from the framework”³⁹⁰.

INSAG-4, that analyses quite in depth the characteristics of safety culture at all its levels, begins with the enumeration of the fundamental elements behind it: first is the individual awareness toward the significance of nuclear safety, knowledge and competence, commitment to the attainment of the highest level of safety, motivation, supervision, and responsibility, intended in the sense of accountability³⁹¹. All these elements must be present at all the different levels that contribute to the establishment of a strong safety culture at the nuclear facility level. Yet, what are these levels? Following the chain of activities listed above that intervene in the actual operations of a nuclear power plant, it is possible to identify three main levels, indicated also in INSAG-4³⁹²: a domestic legislative level, a managerial level, and an individual level. Nevertheless, to the extent that in 1991 the Safety Conventions had not been adopted yet, a fully-fledged international level is not mentioned, but it seems adequate to add it since both the Convention on Nuclear Safety and the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management contain important binding provision related to the development of a sound safety culture (as underlined in the previous chapter), enforced through the peer review mechanism, and both preambles explicitly refers to the desire of contracting parties “to promote an effective nuclear safety culture”³⁹³.

Regarding the domestic legislative level, governments or competent authorities are asked to promote policies, establish regulations, requirements and objectives linked to the grant of licenses, and more generally to take measures with the firm purpose of laying the basis for the building of a good and safe working environment and setting the conditions the development of a workers’ conscious behavior³⁹⁴. In other words, regulatory authorities provide a broad and general

³⁸⁹ Harvey J. et al. (2002). ‘An analysis of safety culture attitudes in a highly regulated environment’, in *Work & Stress*, Vo.16, No.1, pp. 19-20.

³⁹⁰ IAEA (1991). Safety Culture – a report by the International Nuclear Safety Advisory Group, Safety Series No.75_INSAG-4, p. 5.

³⁹¹ Ibid.

³⁹² Ibid.

³⁹³ Convention on Nuclear Safety, Preamble (iv); Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, Preamble (v).

³⁹⁴ IAEA (1991). Safety Culture – a report by the International Nuclear Safety Advisory Group, Safety Series No.75_INSAG-4, p.7.

framework within which actual practices are then elaborated and put in place by operating companies at the facility level. Regulators just provide well-defined but broad objectives, regulations and requirements because, as it was later spelt out in the Safety Conventions explicitly, if on the one hand States retain the international responsibility of ensuring that the highest attainable level of safety is reached, “prime responsibility for the safety of a nuclear installation [the safety of spent fuel or radioactive waste management] rests with the holder of the relevant license and shall take the appropriate steps to ensure that each such license holder meets its responsibility”³⁹⁵; therefore, competent authorities set fundamental pillars without being too prescriptive.

Part of the concept of safety culture at the legislative level comprise the requirement that regulatory authorities are independent so that they can perform their tasks and promote safety without any kind pressure and interference stemming from a possible conflict of interests; at the same time it is necessary to ensure that they have enough power to carry out their functions, and, linked to this, enough funding and a competent staff³⁹⁶. Governments are important because they not only ensure that an adequate safety culture is created and maintained at the domestic level but they also engage in international exchanges (from the entry into force of the Safety Conventions mainly within the framework of the peer review process), thus fostering a constructive process of improvement of the safety culture worldwide, following the acknowledgement that the protection of the domestic environment and population is dependent also upon other States’ actions. There is, as a consequence, a constructive process of social learning at stake that makes safety culture “contagious”.

If on the one hand, States have “overall” responsibility in providing guidance for building an affective safety culture, thus ensuring the safety of nuclear facilities through the work of regulatory authorities, the practical and formal duty to guarantee the maintenance of high levels of nuclear safety at the plant level rests within the operating company and specifically to the plant managerial staff³⁹⁷. The managerial compartment should first of all watch over plant activities to be sure that they are performed rigorously and in such a way to comply with safety standards; second, they have to allocate sufficient resources to safety-related issues that can range from the hiring of highly

³⁹⁵ Convention on Nuclear Safety, Article 9; Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, Article 21.

³⁹⁶ These requirements were then included in the Convention on Nuclear Safety, Article 8, and Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, Article 20, thus making them mandatory.

³⁹⁷ IAEA (2002). *Self-assessment of safety culture in nuclear installations*, IAEA-TECDOC-1321. Vienna: IAEA. pp. 8-11.

qualified and attitudinally-apt personnel (i.e. not only is the technical preparation evaluated but also psychological and behavioral aspects) to ensure that employees are not overburdened, to equipment upgrades and periodical refresher training which is paramount to make certain that the plant staff is perfectly qualified, fully aware of risks entailed in the actions they perform and the consequences that can arise from incaution and lack of due diligence, and they clear know how to avert, respond to and correct errors³⁹⁸; therefore, it is not just a matter of learning to perform a given task following given instructions and improve technical abilities: “without this additional understanding [of the risks involved], nuclear safety issues arising may not receive the attention they warrant or wrong actions may be taken, out of lack of comprehension of the risks involved”³⁹⁹. In this vein, Pidgeon, cited in Cox and Flin, based his whole definition of safety culture on this aspects and assumed that “safety culture can be conceived of as the constructed systems of meanings through which a given worker, or group of workers, understands the hazards of their world. As such, it was deemed to have relative stability and not to change on an hourly, daily or weekly basis”⁴⁰⁰. Moreover, managers should also embark on regular review processes of the plant operations that take into account both their observations but also the experiences and remarks of employees with “the intent [...] to bring fresh judgement to bear and to allow new approaches to be suggested by involving fully competent individuals or bodies outside the normal chain of command”⁴⁰¹. Finally, and also as a way of summarizing the way in which a plant-based safety culture can be established, a key word is commitment; commitment refers to the establishment of precise and overt safety objectives programs, the openly-expressed willingness to enhance the level of safety by keeping it a perennial item in the organization agenda and the continuous stress of its vital importance in the communication with the plant staff⁴⁰². It also refers to the effort in the process of establishing a constructive and favorable working environment that positively influence workers’ attitudes towards safety and in the institution of well-defined and safety-oriented practices⁴⁰³. Though all three levels are essential to foster the attainment of the highest level of safety, the level which most directly affects safety culture is the individual level since it is the plant staff that

³⁹⁸ IAEA (1991). Safety Culture – a report by the International Nuclear Safety Advisory Group, Safety Series No.75_INSAG-4, pp. 8-12.

³⁹⁹ Ibid., p.11.

⁴⁰⁰ Cox S., Flin R. (1998). ‘Safety culture: philosopher’s stone or man of straw?’, in *work & stress*, Vol.12, No.3, p. 191.

⁴⁰¹ IAEA (1991). Safety Culture – a report by the International Nuclear Safety Advisory Group, Safety Series No.75_INSAG-4, p. 9.

⁴⁰² Ibid.

⁴⁰³ Bonaca M. V., Powers D. A. (n.d.). ‘Safety Culture in the Nuclear Industry’. Advisory committee on Reactors Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, p. 2.

materially carries out plant operations. INSAG-4 summarizes the key to attain an excellent safety culture at the facility level by arguing that individuals have to apply “a questioning attitude plus a rigorous and prudent approach plus communication”⁴⁰⁴. The questioning attitude consists in posing oneself some fundamental questions before performing any activities, especially the most complex ones like tests, such as: what risks does it involve? Do I possess adequate skills to go ahead? What can I do to try to prevent any hitch? In other words, the application of a questioning attitude evidences a “commitment to think safely”⁴⁰⁵ that is a necessary component of safety culture. The second identified element is the rigorous and prudent approach whose meaning is self-explanatory: it requires a full understanding and respect of procedures, attentiveness for any kind of unforeseen event, adoption of careful problem-solving stance, request of assistance when in need, and the performance of tasks with the maximum care, caution and prudence⁴⁰⁶. In order to foster this kind of approach, it is necessary to go back to the managerial level because the institution of a system of reward and sanctions can play an important role. Indeed, people’s attitudes and actual behaviors can be influenced by the prospect of receiving a recompense or disciplinary sanctions⁴⁰⁷. However, for this system to encourage rigorous and prudent approaches, it must not be based on productivity and levels of output but on the record of safe conducts⁴⁰⁸. Moreover, it must not create the “threat of sanctions”, otherwise it is likely to incentivize the concealment of errors and the fear of taking action⁴⁰⁹ which might be both very dangerous and problematic; to avoid this, if errors are sporadic and relatively of minor importance, they should be seen as a source of improvement for everybody; only in this way safety culture can benefit from this system.

Resuming the discussion on the individual behavior, the third requirement is communication. Communication entails the fact of receiving and providing information about whatever issue that can help in improving safety, providing punctual reports of activities and, also based on that, proposing and discussing alternative procedures, measures and initiatives, grounded on direct individual observation of actual weak points, with a view to enhance safety; in the context of U.S.

⁴⁰⁴ IAEA (1991). *Safety Culture – a report by the International Nuclear Safety Advisory Group*, Safety Series No.75_INSAG-4, p.13.

⁴⁰⁵ Lee T. R. (2003) cited in Harvey J. et al. (2002). ‘An analysis of safety culture attitudes in a highly regulated environment’, in *Work & Stress*, Vo.16, No.1, p. 19.

⁴⁰⁶ IAEA (2002). *Self-assessment of safety culture in nuclear installations*, IAEA-TECDOC-1321. Vienna: IAEA.

⁴⁰⁷ IAEA (1991). *Safety Culture – a report by the International Nuclear Safety Advisory Group*, Safety Series No.75_INSAG-4, p.11.

⁴⁰⁸ Lee T., Harrison K. (2000). ‘Assessing safety culture in nuclear power stations’, in *Safety Science*, Vol.34, p. 64.

⁴⁰⁹ The adoption of a questioning attitude and rigorous and prudent approach does not mean that any risk-taking behavior must be eliminated. Indeed, it is exactly the fact of taking of pondered risk that is sometimes fundamental to solve alarming situations. In other words, rigorousness, prudence and questioning does not have to lead to inaction and indecisiveness, but it is fundamental to avoid actions undertaken thoughtlessly and with lack of awareness.

nuclear power plants this procedure is called “corrective action program”⁴¹⁰. These dynamics are central to set in motion a fundamental process of learning from experiences and put in place punctual corrective measures that, if carried out, are significant indicators of the presence of a strong safety culture.

It is important to point out how all three main levels, from regulatory to facility level, are all interconnected and interdependent in the sense that weaknesses at one level have repercussions on the other, thus jeopardizing the emergence and maintenance of a strong safety culture. For example, plant personnel can be as careful and cautious as possible *per se* but if they lack adequate training or up-to-date equipment and instruments provided by the operating company, their mere positive attitude and behavior is insufficient to ensure adequate levels of safety if there is a lack of safety culture at the company/managerial level.

INSAG reports and an infinite series other documents clarified the meaning of safety culture and its significance. The subsequent literature then broadened the discussion and focused on one main question: how can nuclear safety be assessed and measured? Assessing and measuring is significant especially as a matter of prevention: indicators about the safety of performed activities can provide valuable inputs for improvement that might be fundamental to avert emergencies and accidents⁴¹¹. Yet, there is a major problem here: safety culture is something partially intangible. As noted above safety culture is made of different components: technical practices, behavioral patterns and competences that can be assessed, but on the other hand it also has to do with beliefs, values, perceptions, attitudes⁴¹² and social norms related to risk and hazard⁴¹³ which is supposedly the most important part of safety culture since often “[it is] employees [...] negative attitude to safety which adversely affect their behavior”⁴¹⁴, and thus leads to critical situations; but how can perceptions and attitudes be transposed into an objective measure? Or, how is it possible to argue that a given belief is objectively good or bad? Obviously, though intangible, all these elements might have material repercussions but the link between safety culture and empirical events is not always direct. Indeed,

⁴¹⁰ Bonaca M. V., Powers D. A. (n.d.). ‘Safety Culture in the Nuclear Industry’. Advisory committee on Reactors Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, p. 6.

⁴¹¹ Morrow S. L., Koves G. K., Barnes V. E. (2014). ‘Exploring the relationship between safety culture and safety performance in U.S. nuclear power operations’, in *Safety Science*, Vol. 69, p.38.

⁴¹² An attitude is defined, in (Lee and Harrison, 2000), as “a relatively enduring predisposition to respond in certain ways (e.g. negatively or positively) in response to some aspects of a person’s environment”. From this definition it is possible to appreciate the importance of the working environment in shaping workers’ attitudes. In turn, the working environment is dependent on the choices, directives and conduct adopted at the managerial level which, again, shows how, even though in assessing safety culture, the focus is strongly on workers and the plant level more generally, there is a tight interconnectedness among the different levels.

⁴¹³ Cox S., Flin R. (1998). ‘Safety culture: philosopher’s stone or man of straw?’, in *work & stress*, Vol.12, No.3, p. 191.

⁴¹⁴ Lee T., Harrison K. (2000). ‘Assessing safety culture in nuclear power stations’, in *Safety Science*, Vol.34, p. 62.

errors leading to emergency or even accidents can occur also in the presence of a strong safety culture; vice versa, the lack of safety culture could remain unidentified because of a lack of tangible negative repercussions. In this regard, Bonaca and Powers, in the early 2000s, affirmed that “[c]urrently, probabilistic safety analysis (PSA) [...] is not able to model and quantify the effects of safety culture on safety performance”⁴¹⁵. This constitutes an important setback because, they continue, “if indeed safety culture affects safety performance and if the linkage between elements of safety culture and safety performance could be established, the identification and monitoring of such elements could provide operators and regulators alike leading indicators of safety performance”⁴¹⁶. However, the debate on how to measure safety culture and how to identify objective elements to define the boundaries of a sound safety culture did not stop because, as (Lee and Harrison, 2000) claim, “there is an urgent demand for methods of assessment, for ways of diagnosing weaknesses; also for benchmarking the strengths of safety cultures across time and between organizations [... and there is] a growing need for measurement”.

Studies and attempts to systematize, measure and consequently assess safety culture focused on statics based on performance indicators, peer reviews⁴¹⁷ and audits⁴¹⁸. It is beyond the scope of this analysis to describe all the research and studies that have been carried out; what is important to note, however, is that research is leading to the delineation of a system of indicators⁴¹⁹ of different factors pertaining to the notion of safety culture that, put together, can give a rough indication about its adequacy. However, the significance of these studies lies in the statistical demonstration that, contrarily to what stated in Bonaca and Powers⁴²⁰, there exist an empirical relationship between safety culture and safety performance, but, regarding the possibility of objectively measuring and assessing safety culture, “[t]here are no established thresholds for determining what

⁴¹⁵ Bonaca M. V., Powers D. A. (n.d.). ‘Safety Culture in the Nuclear Industry’. Advisory committee on Reactors Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, p.2.

⁴¹⁶ Ibid., p. 2.

⁴¹⁷ Based for instance on the templates provided by INSAG-4 which contains a sample of 143 review questions or the ANSCI Human Factors Study Groups Report that aimed at complementing and enhancing the INSAG model.

⁴¹⁸ Statistics are often based on data gathered from all three assessment methods because singularly they might lead to misinterpretations (e.g. the simple consideration of performance indicators can be deviating because the record of specific occurrences like, for instance, shutdowns can be both interpreted as the result of errors stemming from a general lack of safety culture or, on the contrary, as evidence of prudence and caution). See Lee T., Harrison K. (2000). Lee T., Harrison K. (2000). ‘Assessing safety culture in nuclear power stations’, in *Safety Science*, Vol.34, p.64.

⁴¹⁹ See Morrow S. L., Koves G. K., Barnes V. E. (2014). ‘Exploring the relationship between safety culture and safety performance in U.S. nuclear power operations’, in *Safety Science*, Vol. 69, p. 37.

⁴²⁰ See Bonaca M. V., Powers D. A. (n.d.). ‘Safety Culture in the Nuclear Industry’. Advisory committee on Reactors Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

constitutes a “healthy” or “unhealthy” safety culture”⁴²¹. Again, it is possible to obtain indicative data on its adequacy or not, but not an absolute assessment because of the presence of intangible factors and also because there are important location-specific variables, in terms of cultural traits and values.

Now, the establishment of a strong safety culture is implicitly made mandatory by the dispositions contained in the Safety Conventions, since they address several factors that are part of safety culture. The problem is the following: to the extent that safety culture is so hard to be clearly and indisputably assessed, how is it possible to say whether Contracting States are complying or not with the treaty provisions? To make a couple of examples starting from the “General Safety Considerations” contained in the Convention on Nuclear Safety, how is it possible to evaluate whether organizations are giving due priority to nuclear safety in their policies? How is it possible to decide whether human factors are “adequately” taken into account? It follows that it is hardly feasible to assess compliance or non-compliance and the full meeting of the Conventions’ goals but only improvement or lack of improvement through the peer-review process provided by the Safety Conventions.

Finally, the development of a strong or at least adequate safety culture (though, again, it is difficult to define what strong or adequate means) can be considered to be an obligation stemming from the States’ duty to act with due diligence and to follow the preventive or even precautionary principle that require to take all possible steps to avoid harm.

1.3. The establishment of the obligation to notify possible transboundary harm as customary law.

The obligation of notification of actual or even possible transboundary effects is now a key aspect in international environmental law and amounts to a customary obligation. In the process of establishment of a customary duty to notify, the Chernobyl nuclear accident had a paramount role. The accident at the Chernobyl Nuclear Power Plant occurred at 1:23 a.m. Only two days later, in the morning of 28th of April, the first signs that something tragic had happened started to emerge, but not thanks to Soviet official communications to authorities in foreign countries. First evidence of the accident came from Forsmark, a Swedish Nuclear Power Plant: radiation monitoring machines showed high radiation levels coming from the shoes of one employee, but after accurate inspections

⁴²¹ Morrow S. L., Koves G. K., Barnes V. E. (2014). ‘Exploring the relationship between safety culture and safety performance in U.S. nuclear power operations’, in *Safety Science*, Vol. 69, p. 46.

and checks at the Swedish power plant it was clear that radiations came from elsewhere⁴²². The Swedish technicians carried out a careful analysis of the nuclear particles they identified on the grass around the site and discovered that, due to their composition and characteristics, they must have come from Soviet facilities⁴²³. After this finding, Swedish authorities were promptly alerted and subsequently information started to circulate, though they were extremely limited: the only thing that was known was that something worrying had happened within URSS borders. In the evening of that same day, as a consequence of requests of clarifications on the part of other European States' authorities to Soviets ones, TV news in the Soviet Union for the first time reported that an accident had taken place at the Chernobyl facility, but the information provided were extremely scant and tried to minimize about the scale of the event, saying that measures had already been undertaken to eliminate the possible adverse effects, that people affected had already received adequate aid, and that an *ad hoc* governmental commission had been established to deal with the accident⁴²⁴. More information were delivered by Soviet broadcasts the following day when they reported that because of the accident two people died, people living in the town of Pripyat (the closest to the Chernobyl NPP) and three more municipalities were evacuated, and that the accident caused the partial destruction of the reactor 4 building⁴²⁵. However, Western countries came to realize the approximate real scale of the disaster when, always on 29th of April, a US satellite took a picture of the torn reactor building⁴²⁶. Despite that, a fully detailed picture of what had happened the night of the accident and the real extent of its consequences was not clear for months. In this regard, on the 1st of May the IAEA asked Soviet officials to provide more and detailed information on the accident urgently, giving voice to foreign States concerns and needs⁴²⁷. It should be underlined that despite IAEA inspectors had already examined and carried out inspections of URSS nuclear power plants, the agency had neither the power to compel Soviets to disclose information, nor the right to impose plant inspection because they must be authorized by the State⁴²⁸. In this regard, as far as on-site inspections are concerned, Malone, reporting a piece of information which appeared on the New

⁴²² News European Parliament (2014). *Forsmark: how Sweden alerted the world about the danger of the Chernobyl disaster*. Available at: <https://www.europarl.europa.eu/news/en/headlines/society/20140514STO47018/forsmark-how-sweden-alerted-the-world-about-the-danger-of-chernobyl-disaster>. (accessed: 1 March 2020).

⁴²³ Ibid.

⁴²⁴ The Chernobyl gallery (n.d.). *Timeline*. Available at: <http://www.chernobylgallery.com/chernobyl-disaster/timeline/> (accessed: 24 February 2020)

⁴²⁵ Ibid.

⁴²⁶ Ibid.

⁴²⁷ Malone L. A. (1987). 'The Chernobyl Accident: a Case Study in International Law Regulating State Responsibility for Transboundary Nuclear Pollution', in *Columbia Journal of Environmental Law*, Vol. 12, No. 203, p. 233.

⁴²⁸ Ibid.

York Times on the 1st May 1986, affirms that George Schultz, the US Secretary of State, tried to convince Soviet authorities to authorize IAEA safety inspections at the Chernobyl facility⁴²⁹.

Now, after having briefly described the situation, it is fundamental to analyze what was officially stated about a possible obligation to notify accidents promptly and to provide subsequent updated information on a regular basis. On the 4th of May, Secretary of State Schultz openly stated that there existed “an inherent obligation that states have to provide information”⁴³⁰ when, as in the case of nuclear accidents, there are possible transboundary effects. Always in May, at the Tokyo Economic Summit, because of the outrage caused by the Soviet conduct, the parties attending the meeting urged the starting of the process for the drafting of a new international treaty, with the aim of clearly setting the norms of conduct in case of nuclear emergencies⁴³¹. What is interesting to note is that, despite the behavior adopted by the Soviet Union, the General Secretary of the Communist Party of the Soviet Union Mikhail Gorbachev sent a message to UN Secretary General calling for the need to strengthen the international framework for nuclear safety and asked other States to join Soviet efforts; however, the most important thing for the current discussion is that he strongly underlined the need for “a system of prompt notification in the event of accidents and malfunctions at atomic power plants when such occurrences are accompanied by the release of radiation”⁴³². These appeals, voicing the will of the majority of States and especially those with massive civil nuclear programs, were heard and led to the adoption of the Convention on Early Notification in September. This is evidence of the presence of the so-called *opinio juris*.

However, the importance of notification did not emerge out of the blue in the aftermath of the Chernobyl accident. For example, it was already underlined in the ICJ Corfu Channel case⁴³³. If on the one hand, some scholars argued that in that case the Court introduced a general duty to notify, the majority agreed on the fact that the “Court was careful not to pronounce an all-encompassing duty [...] so the Corfu Channel case could not be considered, in and of itself, binding customary

⁴²⁹ Ibid.

⁴³⁰ N.Y Times (1986), quoted in Malone L. A. (1987). ‘The Chernobyl Accident: a Case Study in International Law Regulating State Responsibility for Transboundary Nuclear Pollution’, in *Columbia Journal of Environmental Law*, Vol. 12, No. 203, p. 233.

⁴³¹ Malone L. A. (1987). ‘The Chernobyl Accident: a Case Study in International Law Regulating State Responsibility for Transboundary Nuclear Pollution’, in *Columbia Journal of Environmental Law*, Vol. 12, No. 203, p. 233.

⁴³² N.Y. Times (1986), quoted in Malone L. A. (1987). ‘The Chernobyl Accident: a Case Study in International Law Regulating State Responsibility for Transboundary Nuclear Pollution’, in *Columbia Journal of Environmental Law*, Vol. 12, No. 203, p. 233.

⁴³³ “the Albanian Government did not notify the existence of these mines as required by the Hague Convention VI11 of 1907 in accordance with the general principles of international law and humanity”. ICJ (1949). Corfu Channel Case, p.10

international law”⁴³⁴. Therefore, even though the importance of notification was already acknowledged, it was on a case-specific basis and a general duty could not be identified yet.

In addition, during the 1972 Stockholm Conference on the Human Environment, the Draft Declaration of the Preparatory Committee, contained a principle (Principle 20) that, though it was not adopted and included in the final document, is relevant because it obtained strong support. It stated that

[r]elevant information must be supplied by States on activities or developments within their jurisdiction or under their control whenever they believe, or have reason to believe, that such information is needed to avoid the risk of significant adverse effects on the environment in areas beyond their national jurisdiction.⁴³⁵

Since the draft Principle 20 was widely supported, in December of the same year, the UNGA turned the attention to the issue of notification and, exactly starting from the consideration of said principle, adopted the Resolution 2995⁴³⁶, in which it

[r]ecognizes that co-operation between States in the field of the environment, including co-operation towards the implementation of principles 21 and 22 of the Declaration of the United Nations Conference on the Human Environment will be effectively achieved if official and public knowledge is provided of the technical data relating to the work to be carried out by States within their national jurisdiction, with a view to avoiding significant harm that may occur in the environment of the adjacent area.⁴³⁷

Important is that this Resolution was adopted with 115 votes in favor, 10 abstention and 0 votes against, thus reiterating the broad consensus on the matter.

In this case, even though they did not establish a customary duty of notification, the broad consensus is a clear evidence of *opinio juris* and the fact that they are soft-law instruments is not

⁴³⁴ McClatchey D. F. (1996). ‘Chernobyl and Sandoz One Decade Later: the Evolution of State Responsibility for International Disasters’, 1986-1996, in *Georgia Journal of International Law & Comparative Law*, Vol. 25, No. 659, p. 665

⁴³⁵ Stockholm Conference on the Human Environment (1972). Draft Declaration of the Preparatory Committee, in McIntyre O. (2006). ‘The Role of Customary Rules and Principles of International Environmental Law in the Protection of Shared International Freshwater Resources’, in *Natural Resource Journal*, Vol.46, p. 181.

⁴³⁶ McIntyre O. (2006). ‘The Role of Customary Rules and Principles of International Environmental Law in the Protection of Shared International Freshwater Resources’, in *Natural Resource Journal*, Vol.46, p. 181.

⁴³⁷ UNGA (1972). Resolution 2995 - Co-operation between States in the field of the Environment.

relevant because, as McIntyre argues quoting Hohmann “ the primary role of soft-law instruments in the identification of custom as that of ‘the solidifying of indicators for a documentation of the *opinio juris*’ of States”⁴³⁸. Finally, always prior Chernobyl, a duty of notification was contained also in Article 198 of the UN Convention on the Law of the Sea⁴³⁹.

To sum up, evidence of the opinion that a rule on notification was a matter of necessity was already present prior the Chernobyl accident, but the international contempt for the Soviet Union conduct and the consequences that originated from it, coupled with the clear acknowledgement of the risks related to transboundary effects of hazardous or ultrahazardous activities, made the issue of the duty of notification gain momentum and overall unanimity on the necessity of an all-encompassing obligation of notification was reached at the international level.

Now, as already pointed out, this consensus led to the adoption of the Convention on Early Notification. Some scholars argue that if States decided to engage in the drawing-up of a specific treaty, it means that they wanted and considered necessary to set forth in precise terms the rules that would bind them and this constitute evidence of the lack of a more general customary norm; on the other hand, others firmly believe that the negotiation of a treaty amount to *opinio juris* that contribute to the establishment of a custom⁴⁴⁰, as confirmed by the ICJ in the North Sea Continental Shelf Case when it asserted that customary principles can arise from treaty law⁴⁴¹.

Until now, the focus was on *opinio juris*, one of the two elements that are necessary to identify the existence of a custom, but the presence of the repetition of a behavior is also needed for a norm of customary law to emerge. It is useful to recall that, according to what was stated by the ICJ in the Nicaragua Case, it is not necessary that State behaviors are absolutely uniform and “in absolutely rigorous conformity with the rule”⁴⁴² but

[i]n order to deduce the existence of customary rules, the Court deems it sufficient that the conduct of States should, in general, be consistent with such rules, and that instances of State conduct inconsistent with a given rule should generally have been treated as breaches of that rule, not as indications of the recognition of a new rule. If a State acts in a way *prima facie*

⁴³⁸ McIntyre O. (2006). ‘The Role of Customary Rules and Principles of International Environmental Law in the Protection of Shared International Freshwater Resources’, in *Natural Resource Journal*, Vol.46, p.165.

⁴³⁹ See UN Convention on the Law of the Sea (1982), part XII, Article 198.

⁴⁴⁰ Dupuy P., Le Moli G., Viñuales E. (2018). ‘Customary International Law and the Environment’, C-EENRG Working Papers 2018-2, in Cambridge Centre for Environment, Energy and Natural Resource Governance, University of Cambridge.

⁴⁴¹ ICJ (1969). North Sea Continental Shelf Case, report of judgements advisory opinions and orders, para.71.

⁴⁴² ICJ (1986). Case Concerning Military and Paramilitary Activities in and against Nicaragua (Nicaragua v. United States of America), para. 186.

incompatible with a recognized rule, but defends its conduct by appealing to exceptions or justifications contained within the rule itself, then whether or not the State's conduct is in fact justifiable on that basis, the significance of that attitude is to confirm rather than to weaken the rule⁴⁴³.

So, to ascertain the presence of a customary norm it is necessary to look at what States say or think and what they do. But, if we consider customs in the realm of International Environmental Law, including the duty of notification, there seems to be a problem: is it really possible to identify consistent patterns of behavior “in conformity with the rule”? According to Bodansky, the answer is no. Indeed, he argues that “[a]s a growing number of international legal scholars are recognizing, there is a divergence between the traditional theory of customary law, which emphasizes consistent and uniform state practice, and the norms generally espoused as ‘customary’”⁴⁴⁴. So, in this case we are not in front of the scenario outlined by the ICJ in the Nicaragua case for the identification of the existence of a custom that require a generally consistent behavior on the part of States, but there is more evidence of behaviors that are generally inconsistent with the rule and with what States predicate, namely that there should exist and international obligation to notify possible or actual transboundary effects originating from domestic activities. In this regard, Bodansky states that

[t]he International Law Association [...] concluded that the duty to notify was a norm of customary international law, citing only seven examples of state practice, out of the presumably countless instances in which States have undertaken activities with a significant risk of transboundary harm. Instead, emphasis was placed on the various resolutions and treaties in which the putative customary norm appeared⁴⁴⁵.

Of course, this does not mean that in this case a customary duty of notification cannot be identified due to the fact that State behavior is more often than not inconsistent with the rule: the focus is rather on the side of the *opinion juris*, on what states say or think it is a necessary behavior (something that can be shown through different means e.g. direct official statements, adoption of a treaty, adoption of a UNGA resolution by consensus etc.). This marks a shift in the process of identification of customs. Indeed, it is possible to speak of a declarative/deductive approach that is

⁴⁴³ Ibid.

⁴⁴⁴ Bodansky D. (1995). ‘Customary (and not so customary) International Environmental Law’, in *Indiana Journal of Global Legal Studies*, Vol. 3, p. 111.

⁴⁴⁵ Ibid., p. 111.

biased in favor of finding evidence of the presence of a relevant *opinio juris*, so that it is based on direct or indirect statements about norms, about the way in which law should be (while the traditional process is based on a more inductive process)⁴⁴⁶.

This is not proper of the obligation of notification solely, but it can be said that the majority of customs in the field of International Environmental law, especially the no-harm principle, are based on the identification of a strong *opinio juris*, so that “International environmental norms reflect not how states regularly behave, but how states speak to one another”⁴⁴⁷.

Apart from these considerations on the process of formation and identification of customs in the field of Environmental Law, including the duty to notify, there is the need to determine when a specific norm has acquired the status of binding customary law in order to understand when States became bound to respect it regardless of the adoption of treaties in which said norm is contained. Usually “the moment of ‘transition’ will be retrospectively set by a body, e.g. an intergovernmental conference, a body of an international organization, or an international tribunal, as having taken place at some point in the past”⁴⁴⁸. In the case of the duty of notification, there is not a clear statement of the customary nature of the obligation, but it can be inferred from the work of the ILC that in 2001 adopted the text of the Draft articles on Prevention of Transboundary Harm from Hazardous Activities. Article 17 provides that “[t]he State of origin shall, without delay and by the most expeditious means, at its disposal, notify the State likely to be affected of an emergency concerning an activity within the scope of the present articles and provide it with all relevant and available information”, and according to many scholars, it fall in the realm of codification of environmental law principles.

As cited above, the customary nature of a rule can be identified also in the context of an intergovernmental conference. In 1992, the United Nations Conference on Environment and Development was held in Rio de Janeiro and among the documents that were adopted in that occasion there is the Rio Declaration on Environment and Development. At principle 18, it is stated that “[s]tates shall immediately notify other States of any natural disasters or other emergencies that are likely to produce sudden harmful effects on the environment of those States”. However, it is unclear whether this can be considered as the assertion of the existence of a customary rule, so

⁴⁴⁶ Roberts A., Sivakumarani S. (2018). ‘The theory and reality of the sources of international law’, in Evans M. D. (ed.) *International Law*. Fifth edition. New York: Oxford University Press, p. 104

⁴⁴⁷ *Ibid.*, p. 115.

⁴⁴⁸ Dupuy P., Le Moli G., Viñuales E. (2018). Customary International Law and the Environment’, C-EENRG Working Papers 2018-2, in Cambridge Centre for Environment, Energy and Natural Resource Governance, University of Cambridge.

whether it amount to codification, or it has to be considered as further evidence of *opinio juris*. The latter case seems to be more reasonable also in light of what Handl argues⁴⁴⁹. Referring to Principle 17, 18 and 19, he claims that “[a]t the time of the Rio Conference, and perhaps for a short while thereafter, it might have been permissible to question whether the contents of all three principles corresponded to international customary legal obligations”⁴⁵⁰.

Taking for granted that now the duty of notification is accepted to be a customary norm, it is useful to briefly analyze the nature of the obligation. It can be said that the duty to notify is a natural corollary of the key international law principles of cooperation, due diligence and to a certain extent also of prevention, if prevention is intended as the effort to avert even worse consequences. The close relationship between the duty to notify and the duty to cooperate is self-evident also in light of the discussion held in Chapter 1 on the need to strengthen States cooperation in order to minimize the effects of disasters on individuals and the environment. Concerning the due diligence principle, it is useful to recall that it constitutes an obligation of conduct which means that States have to undertake – or refrain from undertaking – measures to the maximum extent possible with the aim of preventing or minimizing negative events. It stands to reason that if a State does not notify an emergency or accident, it failed to act with due diligence.

Finally, always considering the content of the general duty to notify it should be noted that it is characterized by some important uncertainties: what is the threshold of risk or significance of the possible or actual transboundary release beyond which States must provide notification to possible affected States? And linked to this, which criteria should be adopted to decide which States shall be notified? All States or just those who are considered to be particularly effected? However, this uncertainties could be solved applying the precautionary principle that in the absence of clear data or information about the extent and possible effects of an incident requires to use more than the maximum care and caution and lowers the threshold of significance of the accident/emergency to the minimum⁴⁵¹. In addition, the duty to notify is incorporated in many international treaty on specific topics that provide *ad hoc* requirements and specifications like in the case of the Early Notification Convention.

⁴⁴⁹ Handl G. (2012). ‘Declaration of the United Nations Conference on the Human Environment (Stockholm Declaration), 1972 and the Rio Declaration on Environment and Development, 1992’, in *United Nations Audiovisual Library of International Law*.

⁴⁵⁰ *Ibid.*, p. 6.

⁴⁵¹ McIntyre O. (2006). ‘The Role of Customary Rules and Principles of International Environmental Law in the Protection of Shared International Freshwater Resources’, in *Natural Resource Journal*, Vol.46,p. 185.

In conclusion, the Chernobyl nuclear disaster, because of the conduct adopted by the URSS and the ensuing dramatic transboundary consequence, shed light on the vital importance of the duty to notify emergencies and accidents, and fundamentally contributed to the emergence of a strong *opinio juris* that finally led to establishment of the norm as customary law.

2. Responsibility for and consequences of the nuclear accident at the Fukushima Daiichi NPP.

Fortunately, or unfortunately, up to now there have been two nuclear accidents that were rated at level 7 of the INES scale: the 1986 Chernobyl accident and the 2011 nuclear disaster at the Fukushima Daiichi nuclear power plant. The two accidents are very different because if in the case of Chernobyl the causes of the accident were basically human errors and negligence, the context surrounding the Fukushima disaster is much more complicated to assess. Fukushima was the result of a complex interrelation between natural and human factors. Indeed, the whole nuclear crisis was triggered by the most catastrophic earthquake ever recorded in the history of Japan, the 9.0 magnitude Great East Japan Earthquake⁴⁵², and subsequent terrifying tsunami with waves that reached 40 meters of height⁴⁵³. Yet, several reports issued by different research and investigation commissions⁴⁵⁴ considered the nuclear accident as preventable since the already highly problematic situation was exacerbated by regulatory unpreparedness, inefficiencies, human errors and poor preventive actions. However, there is still a lack of real consensus on whether the accident was caused by natural or human factors; maybe the most reasonable conclusion is that the disaster was a triggered by a chain of events of both natural and human origin. What can be said for sure is that the Fukushima nuclear accident had a huge impact on the global nuclear industry and dramatically reopened the discussion on nuclear safety at the international level.

2.1. Responsibility of the State: could Japan be held responsible for the Fukushima Daiichi Nuclear disaster?

⁴⁵² WHO. (n.d.). *Great East Japan Earthquake, 2011*. Available at: <https://www.who.int/westernpacific/emergencies/great-east-japan-earthquake> (accessed: 7 March 2021)

⁴⁵³ National Geographic (2020). *Mar 11, 2011 CE: Tohoku Earthquake and Tsunami*. Available at: <https://www.nationalgeographic.org/thisday/mar11/tohoku-earthquake-and-tsunami/> (accessed: 8 March 2021)

⁴⁵⁴ See e.g. The Official Report of the Fukushima Nuclear Accident Independent Investigation Committee of the National Diet of Japan or the work by the Independent Investigation Commission on the Fukushima Daiichi Nuclear Accident established by the Rebuild Japan Initiative foundation.

As for the case of Chernobyl, it is useful to understand whether Japanese state authorities actually played a role in the accident. Before delving into the analysis of the possible State responsibility for transboundary harm, that implies the fact of looking at whether the Japan had a direct or indirect responsibility in the accident that caused the damage, it is necessary to introduce the international legal framework against which it can be assessed. From 1986, the year of the Chernobyl accident, to 2011 the applicable international legal framework changed considerably. If considerations on the responsibility of the Soviet Union had to draw from just few principles of customary law or general international law, the situation in 2011 was significantly different. First of all, at the time of the Fukushima nuclear disaster the whole family of international treaties in the field of International Nuclear law that emerged after 1986 were perfectly applicable. In this regard, it is necessary to point out that Japan is a Contracting Party of the three treaties that are mostly relevant here: the Convention on Early Notification of a Nuclear Accident, the Convention on Nuclear Safety and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency. Second, from the 90s an extensive set of legal instruments in the field of environmental protection, though mainly in the form of soft law, contributed to strengthen the importance of prevention, cooperation, due diligence and even precaution when it comes to protect the environment (and as a consequence also the population), and to avert or minimize the impact of transboundary harm. Some of these instruments are worth being mentioned.

In the previous analysis on the possibility of holding the Soviet Union responsible for the Chernobyl accident, the principle of limited territorial sovereignty and no-harm principle, which basically derives from the former, that establish the responsibility of the State for transboundary harm, were mentioned. In relation to them, reference was made to the Stockholm declaration, the Corfu Channel and Trail Smelter cases. Now, in the decade and a half that separates the Chernobyl and Fukushima events, the issue of the responsibility of the State for transboundary harm was reiterated and further developed in the following instruments:

- 1992 Rio Declaration on Environment and Development: Principle 2 declares that

States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within

their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction⁴⁵⁵

which is basically a restatement of what has been already pointed out in the analysis in section 1.1 of this chapter. However, there is another principle that in consideration of what will be described in the following pages takes particular relevance; it is Principle 15 which states that “to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation”; nevertheless, it should be recalled that these principles are soft law, and the customary nature of the precautionary principle is still highly debated⁴⁵⁶.

- 1992 Convention on Biological Diversity, adopted at the Rio Conference: in Article 3 it reports word by word exactly the same content of Principle 2 of the Rio Declaration, which in this case is a mandatory provision. Moreover, Article 14 (b) is significant for the present discussion because it provides that each Contracting Party “introduce appropriate arrangements to ensure that the environmental consequences of its programmes and policies that are likely to have significant adverse impacts on biological diversity are duly taken into account”.

- 1996 ICJ Advisory Opinion on the Legality of the Threat or Use of Nuclear Weapons: it states that “[t]he existence of the general obligation of States to ensure that activities within their jurisdiction and control respect the environment of other States or of areas beyond national control is now part of the corpus of international law relating to the environment”⁴⁵⁷ and that there exists “a general obligation to protect the natural environment against widespread, long-term and severe environmental damage”⁴⁵⁸. Moreover, considering the “unique characteristics of nuclear weapons”, the ICJ referred to radiations, so what it said is valid also in the context of nuclear power plants, and noted that the extremely dangerous effects of radiations have to be taken into absolute consideration because not only do they have a deleterious impact on the environment *per se*, but also because they affect people’s health both directly, through body exposure, and indirectly

⁴⁵⁵ Rio Declaration on Environment and Development (1992). Principle 2.

⁴⁵⁶ See Redgwell C. (2018). International Environmental Law, in Evans M. D. (ed.) *International Law*. Fifth edition. New York: Oxford University Press, pp. 684-685.

⁴⁵⁷ ICJ (1996). Advisory Opinion on the Legality of the Threat or Use of Nuclear Weapons, p. 242, para 29.

⁴⁵⁸ *Ibid.* para. 31; another case in which the protection of the environment was deemed primary by the ICJ, referring to what was stated in the Advisory Opinion, is the Case Concerning the Gabčíkovo-Nagymaros Project (Hungary v. Slovakia) in which “[t]he Court recalls that it has recently had occasion to stress, in the following terms, the great significance that it attaches to respect for the environment, not only for States but also for the whole of mankind”

through environmental and food contamination that lasts for decades, thus having adverse consequences for both present and future generations⁴⁵⁹. In addition, there is another excerpt that could be pertinent which assumes that “[r]espect for the environment is one of the elements that go to assessing whether an action is in conformity with the principles of necessity and proportionality”⁴⁶⁰. This statement can be applied to the consideration of measures undertaken or not undertaken by States to ensure that the highest possible degree of nuclear safety is attained.

- 2010 ICJ judgement on the Pulp Mills Case: again it is important to grasp the content of the good-neighborhood or no-harm principle. The Court noted that

[...] the principle of prevention, as a customary rule, has its origins in the due diligence that is required of a State in its territory. It is ‘every State’s obligation not to allow knowingly its territory to be used for acts contrary to the rights of other States’ (Corfu Channel (United Kingdom v. Albania), Merits, Judgment, I.C.J. Reports 1949, p. 22). A State is thus obliged to use all the means at its disposal in order to avoid activities which take place in its territory, or in any area under its jurisdiction, causing significant damage to the environment of another State. This Court has established that this obligation ‘is now part of the corpus of international law relating to the environment’ (Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, I.C.J. Reports 1996 (I), p. 242, para. 29)⁴⁶¹.

So, in this judgement, the ICJ reiterated the concept it had put forward in previous occasions, but the principle of no-harm was possibly framed in stronger terms because it held that “[... the] State is [...] obliged to use all means at its disposal [emphasis added]” to prevent transboundary damage arising from activities under its jurisdiction, a conduct that is consistent with the principle of due diligence.

This said, did Japanese State authorities used “all means at their disposal” to prevent the Fukushima nuclear accident? First of all, it should be underlined that, in opposition with the Soviet institutional context in which the nuclear sector was nationalized, so that NPP were state-led, in the Japanese case, the Fukushima facility was operated by a private company, TEPCO (Tokyo Electric Power Company). Now, putting all the pieces together, even though the Convention on Nuclear Safety provides, at Article 9, that “prime responsibility for the safety of a nuclear installation rests with the

⁴⁵⁹ Ibid. para 35.

⁴⁶⁰ Ibid. para. 30.

⁴⁶¹ ICJ. (2010). Reports of Judgments, Advisory Opinions and Orders Case Concerning Pulp Mills on the River Uruguay (Argentina V. Uruguay), p. 45, para. 101.

holder of the relevant license”, on the other hand States are obliged to exercise due diligence and put in place all necessary means and adopt all necessary measures in order to “[...]to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction”⁴⁶²; this obligations, applied to the context of nuclear energy production, require states to exercise strict control over nuclear activities by establishing and enforcing a legislative and regulatory framework, regulating licensing and ensuring that licenses terms are always respected after the issuance, surveilling activities carrying out regular inspections (Convention on Nuclear Safety, Article 7). In brief, always according to the Convention on Nuclear Safety, Contracting Parties “shall take the appropriate steps to ensure that each such license holder meets its responsibility”⁴⁶³ since “responsibility for nuclear safety rests with the State having jurisdiction over a nuclear installation”⁴⁶⁴.

The Commission on the Fukushima Daiichi Nuclear Accident, composed by renowned experts, in its independent report on the accident concluded that “even in the technologically advanced country of Japan, the government and the plant operator, Tokyo Electric Power Company (Tepco), were astonishingly unprepared, at almost all levels, for the complex nuclear disaster that started with an earthquake and a tsunami”. Yet, it was not just a matter of simple unpreparedness, there was a lack of due diligence because Japanese authorities failed to undertake all necessary measures to prevent the accident, negligence, and a lack of a strong safety culture.

What is the chain of errors, delays and failures that led to the meltdown of three reactor cores? First of all, there were human errors and misjudgments by workers that contributed to worsen the situation after the earthquake and tsunami. The earthquake and tsunami put the power grid and emergency generators out of work; as a consequence there was no power supply to run the cooling system; without it, the reactor core heated up, leading to an increase in the reactor building internal pressure due to the accumulation of vapor⁴⁶⁵. At that point, this pressure had to be vented but there was a delay of 15 hours in starting the venting operations to reduce the reactor pressure at Unit 1 because plant workers assumed that the emergency cooling mechanism was actually working, but it was not⁴⁶⁶. This is just one error or misjudgment because there were many. This is evidence of

⁴⁶² Rio Declaration on Environment and Development (1992). Principle 2.

⁴⁶³ Convention on Nuclear Safety, Article 9.

⁴⁶⁴ Ibid., preamble (iii).

⁴⁶⁵ The Sasakawa Peace Foundation (2012). *The Fukushima nuclear accident and crisis management - Lessons for Japan-U.S. Alliance Cooperation*. Akasaka: The Sasakawa Peace Foundation, p.12

⁴⁶⁶ Funabashi Y., Kitazawa K. (2012). ‘Fukushima in a review: a complex disaster, a disastrous response’, *Bulletin of Atomic Scientists*, Vol.68, No.2, p. 11.

incompetence on how to judge and manage critical situations that is the result of a poor safety culture for which TEPCO higher-ranking managers and state regulatory authorities are to be blamed. Indeed, Funabashi and Kitazawa point out that

[w]hen on-site workers referred to the severe accident manual, the answers they were looking for simply were not there. And those who misjudged the condition of the emergency cooling system had never actually put the system into service; they were thrown into the middle of a crisis without the benefit of training or instructions⁴⁶⁷.

So, TEPCO did not provide its workers with adequate training and instruction violating its obligation to ensure the safety of nuclear installation, but those which have to be considered originally responsible are State authorities. As a matter of fact, the Nuclear Safety Commission (NSC) issued some guidelines for the revision of facilities safety standards and practices, specifying that “the potential for an extended station blackout need not be considered, as it is reasonable to expect that transmission lines will be restored or emergency power systems repaired quickly”⁴⁶⁸. This constitutes a clear breach of the duty of due diligence that requires to use all the means, in terms of both prevention and precautionary measures, to avoid critical situations. In this sense, if on the one hand it could seem reasonable to think that some form of power supply could be restore in a relatively brief lapse of time, due diligence requires to go beyond simple, immediate reasonableness and reason in terms of the worst case scenario. Moreover, apart from that, it seems clear that State authorities failed to “ensure that sufficient numbers of qualified staff with appropriate education, training and retraining are available for all safety-related activities in or for each nuclear installation” (Article 11 Convention on Nuclear Safety).

Second, as noted above in the quotation referring to the report by the Commission on the Fukushima Daiichi Nuclear Accident, the severity of the situation at the Fukushima NPP after the natural disaster was exacerbated by an inherent lack of emergency preparedness. The specific occurrences which testify that Japanese authorities were poorly prepared to face such a large-scale event are described in Chapter 1, section 3.2.2. Article 16 of the Convention on Nuclear Safety provides that State Parties “shall take the appropriate steps to ensure that there are on-site and off-site emergency plans”. What is appropriate and what is not appropriate is hard to be defined *ex ante*, so that all considerations are based on a case-by-case analysis carried out in light of the events

⁴⁶⁷ Ibid., p. 12.

⁴⁶⁸ Ibid. p. 12.

and in the case of the Convention on Nuclear Safety the appropriateness of the steps taken is assessed in the context of the peer-review process. However, if we assess Japanese authorities preparedness from the due diligence point of view that, again, requires the adoption of “all the means at disposal”⁴⁶⁹, it is clear that this requirement was not respected. To prove so, it is useful to start from the Japanese myth of safety⁴⁷⁰ of NPP. This was a myth that was proposed by interest groups from the beginning of the 60s to promote the development of the domestic nuclear industry⁴⁷¹ that could go ahead only overcoming the public opposition to nuclear energy that derived from the dramatic experience of Hiroshima and Nagasaki. Against this background, regulatory authorities believed that turning too much attention to nuclear emergency preparedness would fuel people’s concerns and anxiety about the safety of NPP⁴⁷². To show concretely the reluctance of State authorities to focus on emergency preparedness, Funabashi and Kitazawa report that in 2010 the Nuclear and Industrial Safety Agency (NISA) suggested that the Niigata prefecture, which wanted to carry out an exercise to test emergency preparedness at the Kashiwazaki- Kariwa Nuclear Power Plant simulating an earthquake, instead based the simulation on heavy snow because an exercise for emergency preparedness in case of earthquakes, that are very frequent in Japan, would unnecessarily cause anxiety and apprehension in the population⁴⁷³.

However, the lack of emergency preparedness stemmed from an intrinsic problem of governance. In Japan, at the time of the Fukushima disaster, there were two main bodies in charge of regulating the nuclear industry: the Nuclear and Industrial Safety Agency (NISA), and the Nuclear Safety Commission (NSC). The NSC is an independent regulatory authority that intervenes in safety policy formulation and watches over NISA safety guidelines enforcement power. The problem is that NISA is part of the Ministry of Economy, Trade and Industry (METI) that, being involved in economic, trade and industrial issues, is very active in the promotion of nuclear energy development; therefore, the placement of a regulatory agency within a ministry that promote nuclear energy was considered to

⁴⁶⁹ ICJ. (2010). Reports of Judgments, Advisory Opinions and Orders Case Concerning Pulp Mills on the River Uruguay (Argentina V. Uruguay).

⁴⁷⁰ See Caroli R. (2017). ‘Attivismo femminile e deperiferizzazione del disastro nucleare nel Giappone post Fukushima’, in *DEP-Deportate, esuli, profughe*, Vol.35, p.154.

⁴⁷¹ Ibid.

⁴⁷² Funabashi Y., Kitazawa K. (2012). ‘Fukushima in a review: a complex disaster, a disastrous response’, *Bulletin of Atomic Scientists*, Vol.68, No.2, p. 14.

⁴⁷³ Ibid., p. 14.

be a barrier to adequate NISA independence and a dangerous source for conflicts of interest⁴⁷⁴. This goes exactly against what is declared in Article 8 of the Convention on Nuclear Safety⁴⁷⁵.

Funabashi and Kitazawa point out that this institutional arrangement had been considerably criticized, prior 2011, by the international community and the IAEA itself had officially asked Japan to provide clarifications on the regulatory responsibilities of NISA and those to be carried out by the NSC, particularly in context of the elaboration of guidelines on the assessment of nuclear safety⁴⁷⁶. It is relevant to note that in 2007, the IAEA undertook an “Integrated Regulatory Review Service” that, through accurate recommendations, “[...] is intended to strengthen and enhance the effectiveness of the State’s regulatory infrastructure”⁴⁷⁷. However, the NSC basically refused IAEA recommendations underlining that “Japan has been praised highly for regulations that are, on the whole, outstanding in the context of international standards and that are functioning effectively to ensure nuclear safety”⁴⁷⁸. As a consequence no action was taken to improve the regulatory structure that, apart from conflicts of interest stemming from close links of regulatory authorities with the nuclear industry, was also fraught with red tape. In this conditions, it is clear that punctual, accurate and periodically updated safety standards and guidelines could hardly be delivered.

However, the most upsetting deficiency in the regulatory structure (which characterized NISA in particular) that completely contradicts the NSC statement issued in the aftermath of the IAEA Integrated Regulatory Review Service, and that dramatically exacerbated the nuclear crisis that was taking place at the Fukushima NPP, has not been mentioned yet, which says much on the responsibility Japanese authorities had in the disaster. NISA was completely lacking the necessary culture, technical competence and experts that could allow it to accurately perform its regulatory tasks⁴⁷⁹; this utmost lack of competences and expertise clearly came to the surface when NISA officials, in the most critical phases of the emergency, were completely unable to provide guidance

⁴⁷⁴ World Nuclear News (2012). *New Japanese regulator takes over*. Available at: https://www.world-nuclear-news.org/RS-New_Japanese_regulator_takes_over-1909125.html (accessed: 15 March 2021); regarding the aspect of the independence and competence of the designated regulatory authorities, in several occasions Contracting Parties to the NSC pointed out the challenges linked to the meeting of this requirement and expressed concerns for the general state of these bodies worldwide. See Cavoski A. (2013). ‘Revisiting the Convention on Nuclear Safety: Lessons Learned from the Fukushima Accident’, in *Asian Journal of International Law*, Vol.3, No.2, p. 373.

⁴⁷⁵ “Each Contracting Party shall take the appropriate steps to ensure an effective separation between the functions of the regulatory body and those of any other body or organization concerned with the promotion or utilization of nuclear energy”. Convention on Nuclear Safety, Article 8.

⁴⁷⁶ Funabashi Y., Kitazawa K. (2012). ‘Fukushima in a review: a complex disaster, a disastrous response’, *Bulletin of Atomic Scientists*, Vol.68, No.2, p. 15.

⁴⁷⁷ IAEA (2007). Integrated Regulatory Review Service (IRRS) to Japan, IAEA-NSNI-IRRS-2007/01.

⁴⁷⁸ Funabashi Y., Kitazawa K. (2012). ‘Fukushima in a review: a complex disaster, a disastrous response’, *Bulletin of Atomic Scientists*, Vol.68, No.2, p. 15.

⁴⁷⁹ Caldicott E. (2014). *Crisis without end*. New York: The New Press, p.19.

on how to minimize damage and the only thing that was done was to urge TEPCO to continuously provide updated information on the on-site situation⁴⁸⁰. The absence of indications on how to avert a complete nuclear catastrophe led to frictions between government authorities and TEPCO. The earthquake and tsunami caused a situation of no electric power supply that is essential for the cooling system to work and pump water into the reactor core to cool it; without it, the reactor core heats up as a consequence of the decreasing level of cool water and, if the temperature increase, vapor and hydrogen is created and this makes the pressure inside the reactor surge⁴⁸¹. The reactor core at Unit 1 melted down completely 16 hours after the earthquake but this was not immediately acknowledged⁴⁸². TEPCO workers started to manually pump fresh water inside reactor 1 to try to decrease the core temperature but an hydrogen explosion damaged water lines⁴⁸³. At that point, the only solution was to pump sea water in the reactor. However, to start injecting sea water, government authorization was needed, but discussions to provide the authorization protracted for more than two hours because of uncertainties⁴⁸⁴. In the meanwhile, tension mounted at the NPP where it was clear that such delays were unacceptable, and for this reason the director of the Fukushima NPP unilaterally ordered workers to start pumping sea water in the reactor core. It was subsequently acknowledged that this decision was crucial to avoid further deterioration of the situation⁴⁸⁵. This is clear evidence of how Japanese regulatory authorities did not possess “adequate competence”, as Article 8 (1) of the Convention on Nuclear Safety requires.

Yet, there is another paramount aspect to consider that fundamentally contributes to shed light on the Japanese State responsibility for the Fukushima nuclear accident. It has to do with, once again, a dramatic lack of due diligence on the part of State regulatory bodies that did not compel TEPCO, the plant operator, to take necessary preventive measures against predictable events, thus failing to employ all necessary means to avoid a dramatic accident with significant transboundary effects. In this regard, it is useful to mention the Official Report of the Fukushima Nuclear Accident Independent Investigation Commission. From the report, it is possible to read that

⁴⁸⁰ Funabashi Y., Kitazawa K. (2012). ‘Fukushima in a review: a complex disaster, a disastrous response’, *Bulletin of Atomic Scientists*, Vol.68, No.2, p. 15.

⁴⁸¹ TEPCO (2011). *Reactor Core Status of Fukushima Daiichi Nuclear Power Station Unit 1*. Available at: https://www.tepco.co.jp/en/press/corp-com/release/betu11_e/images/110515e10.pdf (accessed: 16 March 2021).

⁴⁸² Ibid.

⁴⁸³ Funabashi Y., Kitazawa K. (2012). ‘Fukushima in a review: a complex disaster, a disastrous response’, *Bulletin of Atomic Scientists*, Vol.68, No.2, p. 15.

⁴⁸⁴ Ibid.

⁴⁸⁵ Ibid.

[t]he direct causes of the accident were all foreseeable prior to March 11, 2011. [...] TEPCO and the Nuclear and Industrial Safety Agency (NISA) were aware of the need for structural reinforcement in order to conform to new guidelines⁴⁸⁶, but rather than demanding their implementation, NISA stated that action should be taken autonomously by the operator. The Commission has discovered that no part of the required reinforcements had been implemented on Units 1 through 3 by the time of the accident. This was the result of tacit consent by NISA for a significant delay by the operators in completing the reinforcement. [...] Since 2006, the regulators and TEPCO were aware of the risk that a total outage of electricity at the Fukushima Daiichi plant might occur if a tsunami were to reach the level of the site. They were also aware of the risk of reactor core damage from the loss of seawater pumps in the case of a tsunami larger than assumed in the Japan Society of Civil Engineers estimation. NISA knew that TEPCO had not prepared any measures to lessen or eliminate the risk, but failed to provide specific instructions to remedy the situation⁴⁸⁷.

The report follows by also indicating the negative stance of Japanese regulatory bodies in the face of new technological and safety findings coming from abroad⁴⁸⁸ that could instead be a valuable help to update and upgrade the NPPs defenses. Indeed, the Fukushima Daiichi NPP construction dates back 1967 and it was based on the then-knowledge about seismology. Of course, research in the field, both in Japan and abroad, made incredible progresses over the years and indicated that there was a considerably high likelihood that tsunamis, generated by extreme magnitude earthquakes, could by far exceed the prediction on which the Fukushima NPP defenses were based, thus leading to core damage⁴⁸⁹. TEPCO ignored these findings on the ground that the probability of such an event was too low and based on mere “academic” speculations⁴⁹⁰ and NISA, which is entrusted with the enforcement of safety guidelines, basically abided this behavior⁴⁹¹. Yet, both in 2005 and 2007 earthquakes of a relevant magnitude had struck Japan and, as the seismologist Ishibashi Katsuhiko remarked “[I]n each case, the maximum ground motion caused by the quake

⁴⁸⁶ As described by the Report itself, these new guidelines, issued in 2006 by the NSC and called “anti-seismic backcheck”, required nuclear power plants operators to revise the anti-seismic mechanisms of safety of their facilities, in light of new standards.

⁴⁸⁷ The National Diet of Japan- The Fukushima Nuclear Accident Independent Investigation Commission (2012). *The official report of The Fukushima Nuclear Accident Independent Investigation Commission*. The National Diet of Japan.

⁴⁸⁸ *Ibid.*

⁴⁸⁹ *Ibid.*, p.27

⁴⁹⁰ Funabashi Y., Kitazawa K. (2012). ‘Fukushima in a review: a complex disaster, a disastrous response’, *Bulletin of Atomic Scientists*, Vol.68, No.2, p. 14.

⁴⁹¹ The National Diet of Japan- The Fukushima Nuclear Accident Independent Investigation Commission (2012). *The official report of The Fukushima Nuclear Accident Independent Investigation Commission*. The National Diet of Japan, p.16.

was stronger than the seismic design criteria for the nuclear power plants”⁴⁹². Therefore, already six years before the Fukushima disaster, it was perfectly clear that Japanese NPP were not equipped to properly withstand seismic events that in an earthquake-prone State like Japan are not exceptional at all. The same seismologist, in 2007 claimed that “[t]he period of high-level seismic activity will continue for another 40 years or more. Unless radical steps are taken now to reduce the vulnerability of nuclear power plants to earthquakes, Japan could experience a true nuclear catastrophe in the near future”⁴⁹³. This was not a prophecy but clear confirmation that scientific and empirical evidence was available on the need to take immediate steps to strengthen NPP safety. Moreover, Mr. Katsuhiko was a member of the expert panel which worked to develop the 2006 “anti-seismic backcheck” guidelines, but he resigned before their final issuance because he was in disagreement with the group’s loose attitude⁴⁹⁴. As a consequence, even though what happened on 11th March 2011 was always labelled as “unanticipated” by TEPCO and the Japanese government, it was instead foreseeable and as such it had to be adequately prevented. In addition, even though doubts were raised on the validity of seismologic models and their scientific basis, first there was undisputable empirical evidence of the high probability of re-occurrence of high-magnitude earthquakes; second, the very presence of studies that hinted at the inadequacy of NPPs design in the event of not-so-improbable natural phenomena, even in the face of scientific uncertainty, had to push for the taking of precautionary measures.

The behavior of the regulatory authorities appears even more inadequate if we consider that, in the 90s, TEPCO falsified the results of some inspections and tests (which were even attended by regulatory authorities, something that might hint at a very serious collusion between the company and the national inspector)⁴⁹⁵, and the Fukushima facility was already theatre of two non-irrelevant accidents, both rated at level two of the INES scale, that took place in 1978 and 1990⁴⁹⁶. Even though they occurred many years before the disaster of the 11th March 2011, all these occurrences should have been interpreted by state authorities as signs of the need to always strengthen and revise safety standards and to increase the activities of supervision over TECPO because those first accidents could signify that there was a poor plant-level safety culture.

⁴⁹² Gaku I. (2007). ‘Why Worry? Japan's Nuclear Plants at Grave Risk From Quake Damage’, in *the Asia-Pacific Journal*, Vol.5, No.8, p. 1.

⁴⁹³ *Ibid.*, p.2.

⁴⁹⁴ *Ibid.*

⁴⁹⁵ Cavoski A. (2013). ‘Revisiting the Convention on Nuclear Safety: Lessons Learned from the Fukushima Accident’, in *Asian Journal of International Law*, Vol.3, No.2, p. 377.

⁴⁹⁶ Osaka E. (2012). ‘Corporate Liability, Government Liability and the Fukushima Nuclear Disaster’, in *Washington International Journal*, Vol. 21, No.3, p. 450.

In light of what has been described about the behavior of TEPCO and, most importantly, about the passivity and negligence of the regulatory authorities, it can also be said that Japan failed to meet the obligations set out in several articles of the Convention on Nuclear Safety, specifically Article 6 which provides that “[w]hen necessary in the context of this Convention, the Contracting Party shall ensure that all reasonably practicable improvements are made as a matter of urgency to upgrade the safety of the nuclear installation”⁴⁹⁷, Article 14 (i) which states that “[e]ach Contracting Party shall take the appropriate steps to ensure that [...] comprehensive and systematic safety assessments are [...] updated in the light of significant new safety information”, and Article 17 (i)(iii) that compels Contracting Parties to “take the appropriate steps to ensure that appropriate procedures are established and implemented: (i) for evaluating all relevant site-related factors likely to affect the safety of a nuclear installation for its projected lifetime” and also “(iii) for re-evaluating as necessary all relevant factors referred to in sub-paragraphs (i) [...] so as to ensure the continued safety acceptability of the nuclear installation”. In the specific case, these dispositions compel Japan to take into serious consideration and carefully evaluate all geological and seismological data, in order to predispose prompt preventive or even precautionary measures, a behavior that was not adopted by Japanese competent authorities and operating company.

The only thing for which Japan cannot be blamed is the immediate notification of the emergency. Indeed, one hour and a half after the earthquake, Japan had already notified the IAEA about the event, in conformity with the dispositions contained in the Early Notification Convention⁴⁹⁸. Yet, despite the prompt notification, neighboring countries in particular complained about the non-provision of updates about how the situation was unfolding at the Fukushima NPP⁴⁹⁹. This can be claimed to be a breach of Articles 2(b) and 5(2) of the Convention on Early Notification, even though the rather discretionary element introduced by the scope of application of the Convention, described in the previous Chapter, complicates the assessment about the failures of the Japanese government⁵⁰⁰.

⁴⁹⁷ It should be remarked, however, that the wording “when necessary” raises a fundamental question: when is it possible to argue that there is a state of necessity? It can be argued that, in light of the importance which nowadays the precautionary principle has, necessity arises as soon as there even the minimum doubt about a possible safety problem, but there can be other interpretations as well.

⁴⁹⁸ Burns S. G. (2018). ‘The impact of the major nuclear power plant accidents on the international legal framework for nuclear power’, in *Nuclear Law Bulletin*, Vol. 2018/2, No.101, p. 22.

⁴⁹⁹ Cavoski A. (2013). ‘Revisiting the Convention on Nuclear Safety: Lessons Learned from the Fukushima Accident’, in *Asian Journal of International Law*, Vol.3, No.2, p. 386.

⁵⁰⁰ Article 1, which specifies the scope of application of the Early Notification Convention, deals with accidents that “may result in an international transboundary release that could be of radiological *safety significance* for another State”.

Now, turning to the possibility of invoking the responsibility of Japan for the transboundary damage caused by the Fukushima nuclear accident, it should be recalled that the Convention on Nuclear Safety does not provide for the possibility of resorting to the ICJ or an arbitral tribunal because it is exclusively based on a peer-review mechanism of enforcement and dispute settlement. As a consequence, if a State affected by the transboundary impact of the accident had wished to invoke Japan's responsibility in front of ICJ, prior acceptance of Japan, it could not do so on the ground that Japan breached the obligations set out in the Convention on Nuclear Safety. However, the hypothetical affected State could refer to all abovementioned instruments related to the no-harm principle and due diligence, as well as referring to the human right violation argument.

In reality, no State invoked the responsibility of Japan for transboundary damage. The main reason for this could be that the radioactive contamination arising from the Fukushima accident was relatively low, also because the wind pushed the radioactive plume towards the Pacific and not more inland⁵⁰¹; consequently, it would have been extremely hard for foreign States to provide clear evidence of an actual causal link between the release of radioactive material from the Fukushima NPP and alleged damage to respect the requirement set out in the Pulp Mills judgement.

However, to repeat, States could resort to the human rights violation argument, as described in the section concerning the alleged responsibility of the Soviet Union for the Chernobyl accident but they did not. According to Cavoski, the reason could lie in the presence of a "tacit solidarity between states, especially those who are extensive users of nuclear energy"⁵⁰² that considered the risk of creating a precedent, thus favoring systems of civil liability for damage.

2.1.1. The issue of deliberate radioactive water dumping in the Pacific Ocean and radioactive water leaks.

There is another aspect of the Fukushima nuclear accident that attracted the attention and harsh criticisms of the international community and of the neighboring countries in particular: the discharge of radioactive water in the Pacific Ocean. As described above, in order to try to cool the reactor cores, water was pumped inside it and then stored in tanks when it warmed up in order to re-pump fresher water: it was a continuous cycle of filling and removal. Japanese authorities started

⁵⁰¹ The Sasakawa Peace Foundation. (2012). *The Fukushima nuclear accident and crisis management - Lessons for Japan-U.S. Alliance Cooperation*. Akasaka: The Sasakawa Peace Foundation, p.12.

⁵⁰² Cavoski A. (2013). 'Revisiting the Convention on Nuclear Safety: Lessons Learned from the Fukushima Accident', in *Asian Journal of International Law*, Vol.3, No.2, p.391.

to discharge 11,000 tons of contaminated water on the 4th of April 2011 out of the necessity to free some tanks and create room to store more contaminated water⁵⁰³. The problem lies in the fact that neighboring countries that could be negatively affected by the dumping of this radioactive water and the international community at large were not notified in adequate advance about this move: a general notification was submitted few minutes after the beginning of the discharge operations and embassies of the potentially most affected countries (China, South Korea and Russia) were notified about the likely impact of the contaminated water release only two days later⁵⁰⁴.

This decision can be said to fall within the scope of application of the Convention on Early Notification. Indeed, Article 2 provides that States shall “promptly provide [those States which are or may be physically affected and the Agency] with such available information relevant to minimizing the radiological consequences in those States”; however, it should be kept in mind that said convention establish an obligation of notification for “international transboundary release that could be of radiological safety significance [emphasis added] for another State”. Yet, at the time of the Fukushima accident there also existed a more general customary principle that compelled States to provide timely notification of actions with possible transboundary affects. Consequently, it can be argued that Japan failed to respect this obligation and the obligation to act with due diligence and cooperate in good faith with other States.

In addition to the problem of notification, some considerations could also be added on the legality of the act itself. There are two relevant Conventions, of which Japan is a Contracting Party, that are useful for this purpose: the UNCLOS Convention and the 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matters with its 1996 protocol.

Despite addressing directly the problem of dumping and marine pollution, none of these Convention apply to the specific case, thus revealing a gap in the international legal system that fail to regulate similar instances. As a matter of fact, regarding the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matters, Ghorbi argues that “[t]he London Convention and Protocols have not been historically interpreted to apply to land-based ocean dumping”⁵⁰⁵

⁵⁰³ Ghorbi D. (2012). ‘There’s Something in the Water: the Inadequacy of International Anti-Dumping Law as Applied to the Fukushima Daiichi Radioactive Water Discharge’, in *American University International Law Review*, Vol.27, No.2, p. 478.

⁵⁰⁴ Cavoski A. (2013). ‘Revisiting the Convention on Nuclear Safety: Lessons Learned from the Fukushima Accident’, in *Asian Journal of International Law*, Vol.3, No.2, p. 386.

⁵⁰⁵ Ghorbi D. (2012). ‘There’s Something in the Water: the Inadequacy of International Anti-Dumping Law as Applied to the Fukushima Daiichi Radioactive Water Discharge’, in *American University International Law Review*, Vol.27, No. 2, p. 480.

because the text of the Convention speaks of dumping “at sea”⁵⁰⁶. Moreover, even if the Convention were applicable, it provides for an important exception for which “[a] Contracting Party may issue a special permit as an exception to article IV(1)(a), in emergencies, posing unacceptable risk relating to human health and admitting no other feasible solution”⁵⁰⁷; in theory the same Article stipulates that before issuing this special permit, Contracting Parties shall consult all other States that can potentially be affected and the IMO but “[t]he Party shall follow these recommendations to the maximum extent feasible consistent with the time within which action must be taken”⁵⁰⁸, so there is an exception in the exception due to urgency.

The UNCLOS Convention specifically addresses the issue of land-based marine pollution but it just obliges Contracting Parties to “adopt laws and regulations to prevent, reduce and control pollution of the marine environment from land-based sources [...] taking into account internationally agreed rules, standards and recommended practices and procedures” (Article 207) and to enforce them (Article 213), so there is just an obligation to establish clear rules on the matter. This means that there was not an apparent legal basis to challenge the legality of the discharge of contaminated water in the ocean.

Moreover, it seems that the obligations set out for example in the Espoo Convention or in the Draft Articles on the Prevention of Transboundary Harm from Hazardous Activities (to the extent that they codify existing customs) regarding the carry-out of impact assessments, consultation and cooperation with “concerned Parties”⁵⁰⁹, namely those parties that are potentially affected by a given activity in terms of transboundary effects does not apply to the specific case. Indeed, their scope of application is limited to planned, proposed activities, they refer to set-up of industrial economic activities or projects while they do not deal with emergency actions undertaken in times of crisis which is rather logic because of time constraints: there is the necessity to act as soon as possible, in order to avoid the worsening of the situation.

The management of the stored contaminated water raised also new doubts on the willingness and ability of the Japanese authorities to exercise due diligence regarding the oversight of the relief operations and activities at the Fukushima NPP. In 2013, it was found out that radioactive water was leaking out of containment tanks and TEPCO confessed that possibly 300 MT of extremely radioactive water a day had been leaking from the facility and it was also acknowledged that it was

⁵⁰⁶ See Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matters.

⁵⁰⁷ Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matters, Article V.

⁵⁰⁸ *Ibid.*

⁵⁰⁹ See Convention on Environmental Impact Assessment in a transboundary context, Article 2; Draft Articles on Prevention of Transboundary Harm from Hazardous Activities, Article 2.

not impossible to assume that such leakages had been taking place since 2011 and part of that water also ended up into the ocean⁵¹⁰. The Guardian reported the statement of a Japanese regulator who declared that “[Japanese regulatory authorities] have instructed Tepco to find the source of contaminated water – from which tank the water is leaking – and to seal the leakage point [and to] retrieve contaminated soil to avoid a further expansion of toxic water, and to strengthen monitoring of the surrounding environment”⁵¹¹. These are *ex post* instructions that reveal how little was done to avoid the incident. The same article by The Guardian mentions a statement by the Japanese then-Prime Minister Shinzo Abe who declared that “he had lost faith in Tepco's ability to handle the water crisis without government help”⁵¹². Yet, the very fact that the problem of water leaks had been present for two years reveals that on the one hand there is an astounding inability of TEPCO to manage such delicate operations safely, with due care and attention, and that, on the other hand, the government failed to take necessary steps to ensure that the company respected safety standards and took preventive or at least all possible minimization measures since it was already clear that the company struggled to rise the occasion.

The fate of the radioactive water stored at Fukushima continued to attract the attention of the international community especially in recent times. All tanks which contain the contaminated water used to cool the Fukushima reactors over the years are supposed to be completely full by mid 2022 which opens up the question about how to dispose of this water⁵¹³. After having asked the IAEA to study and submit a review on the matter, the Agency suggested that Japan could basically choose between two options: make this water evaporate or discharge it into the ocean⁵¹⁴; both methods are already widely used all over the world in the context of normal operations, though under strict regulatory oversight and on the basis of careful environmental impact assessments⁵¹⁵. Of course, the radioactive water cannot be disposed as it is but it is already treated through the Advanced Liquid Processing System that eliminates the majority of the contaminants; the problem is that the system will never manage to reduce them to zero⁵¹⁶. The decision of Japan to discharge the water

⁵¹⁰ McCurry J. (2013). *Fukushima operator reveals leak of 300 tonnes of highly contaminated water*. Available at: <https://www.theguardian.com/world/2013/aug/20/fukushima-leak-nuclear-pacific> (accessed: 20 March 2021).

⁵¹¹ Ibid.

⁵¹² Ibid.

⁵¹³ World Nuclear News. (2020). *IAEA supports discharges of Fukushima Daiichi water*. Available at: <https://world-nuclear-news.org/Articles/IAEA-supports-discharge-of-Fukushima-Daiichi-water> (accessed: 22 March 2021)

⁵¹⁴ Ibid.

⁵¹⁵ Ibid.

⁵¹⁶ The most radioactive elements like Strontium-90 and iodine-129 are almost completely removed but hints will always be present; moreover, the system does not work for Tritium which is far less radioactive than other substances but not harmless. See Vaughan A. (2020). *Should Japan dump radioactive water from Fukushima into the ocean?*

into the ocean triggered a series of strong reactions. First, local fisherman strongly protested and claimed that their rights were being violated and that their concerns were not being addressed because the planned move to dump contaminated water into the ocean would destroy their industry that already struggled to recover after the disaster. Second, there was the opposition of environmental groups. In this regard, Greenpeace, published a report in which it announced to have found out that the isotope carbon-14, which is radioactive, contained in the water that was planned to be discharged into the sea, could potentially cause damage to the human DNA⁵¹⁷. In addition, the director of the non-profit organization Institute of Public and Environmental Affairs argued that there were still many uncertainties regarding the impact of the discharge because of the enormous quantity of water that is supposed to be dumped⁵¹⁸. On the other hand, however, Pascal Bailly du Bois of the French Cherbourg-Octeville Radioecology Laboratory argued that “[t]he radiological impact on fisheries and marine life will be very small, similar to when the Fukushima reactors were operating under normal conditions”⁵¹⁹. From these statements, it is clear that there is not scientific consensus on the consequences that such operation of dumping is likely to bring about. So, is not it an instance in which it is appropriate to apply the precautionary principle? In theory, the answer should be yes, but the fact remains that, because of safety conditions⁵²⁰, measures to dispose of that water must be taken urgently. Therefore, considerations turn around which decision is less harmful: dumping on the one hand, or postponing the decision, increasing the risk of accidents and crises, in order to gather more scientific data; current knowledge suggest that the risks linked to dumping fall short of keeping the water stored in the tanks at the Fukushima Daiichi NPP. However, after last year the Japanese government was accelerating the procedures to speedily go ahead with the start of the dumping operations, the United Nations Human Rights Office of the High Commissioner delivered a statement in June “[urging] the Japanese Government to delay any decision on the ocean-dumping of nuclear waste water from the reactors at Fukushima Daiichi until

Available at: <https://www.newscientist.com/article/2258055-should-japan-dump-radioactive-water-from-fukushima-into-the-ocean/> (accessed: 24 March 2021).

⁵¹⁷ Greenpeace (2020). *Fukushima Pacific Ocean discharge will release hazardous radioactive carbon-14 with potential to damage human DNA*. Available at: <https://www.greenpeace.org/japan/nature/press-release/2020/10/23/45775/> (accessed: 24 March 2021).

⁵¹⁸ Jie S. (2020). *Region outraged at Fukushima water plan*. Available at: <https://www.globaltimes.cn/content/1204708.shtml> (accessed: 26 March 2021).

⁵¹⁹ Vaughan A. (2020). *Should Japan dump radioactive water from Fukushima into the ocean?* Available at: <https://www.newscientist.com/article/2258055-should-japan-dump-radioactive-water-from-fukushima-into-the-ocean/> (accessed: 24 March 2021)

⁵²⁰ E.g. on 13th February 2021 a major earthquake (magnitude 7.1) hit the Fukushima Prefecture. See World Nuclear News (2021). *Increased rate of water leakage at Fukushima reactors*. Available at: <https://www.world-nuclear-news.org/Articles/Increased-rate-of-water-leakage-at-Fukushima-react> (accessed: 28 March 2021).

after the COVID-19 crisis has passed and proper international consultations can be held”⁵²¹. Basically, the UN human rights experts gave voice to the concerns of all stakeholders, from neighboring countries to local communities, and, despite the IAEA reassurances about the safety of the operations, it urged to slow operations down in order to conduct more accurate consultations with the Parties involved, in accordance with international obligations, since the disposal of this radioactive water is something that might affect the enjoyment of human rights of many people also outside the Japanese territory. The UN human rights experts argued that “ COVID-19 must be not be used as a sleight of hand to distract from decisions that will have profound implications for people and the planet for generations to come”⁵²². This appeal was not taken into high consideration and, as UN News reports, in early April 2021 Japan approved the action plan to proceed with the discharge, despite the continuing opposition of local fisherman, NGOs and neighboring countries; this decision was considered “very concerning” by UN experts⁵²³.

What is sure is that this issue is contributing to undermine the stability in the region and it will inevitably constitute an obstacle to economic and political cooperation. As a matter of fact, South Korea, which still prevent the import of fishery products from the Fukushima region, has oftentimes explicitly signaled its fears over last years, labelling Japan’s decision as a “grave threat” for the environment⁵²⁴.

2.2. Consequences of the Fukushima disaster on the international debate on Nuclear Safety.

The disaster of Fukushima triggered the immediate reopening of the issue of nuclear safety at the international level that was discussed in series of meetings and conferences. The accident took place exactly one month before the Fifth Review Meeting of the Parties to the Convention on Nuclear Safety, so it constituted the first occasion in which States could discuss what had happened in Japan and set an international agenda to tackle the issues that would have emerged from the Fukushima experience. Regarding the actions undertaken during the Review Meeting concerning the Fukushima disaster, first of all Contracting Parties adopted a statement in which they reaffirmed the

⁵²¹ OHCHR. (2020). *Fukushima: Japan must not ignore human rights obligations on nuclear waste disposal – UN experts*. Available at: <https://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=25940&LangID=E> (accessed: 28 March 2021)

⁵²² Ibid.

⁵²³ UN News (2021). *Japan: UN experts ‘deeply disappointed’ by decision to discharge Fukushima water*. Available at: <https://news.un.org/en/story/2021/04/1089852> (accessed: 30 March 2021).

⁵²⁴ Jie S. (2020). *Region outraged at Fukushima water plan*. Available at: <https://www.globaltimes.cn/content/1204708.shtml>. (accessed: 26 March 2021)

primary importance of meeting the objectives set out in the Convention, stressed their commitment to determine what lessons must be learnt from Fukushima and which actions must be undertaken to address them, restated the key role of the IAEA in the field of nuclear safety, and expressed their willingness to organize an Extraordinary Meeting in 2012 with the aim to analyze more in depth the causes of the accident, lessons learnt and identify the way forward⁵²⁵. Moreover, as well as committing to delve into the causes and implications of the disaster in future meetings, the discussions held during Fifth Review Meeting itself were profoundly affected by the occurrence, also because the president of the Meeting himself urged States to address nine points in particular in their Country Groups talks and presentations that were directly related to the accident⁵²⁶. Under this indication, several States shared the actions they were taking to re-assess and re-examine the safety of their nuclear facilities in the event of extreme natural events⁵²⁷.

In light of the critical points that were described in the previous sections about the factors that contributed to exacerbate the situation in Fukushima, there are some observations that emerged during the Review Meeting that are worth being mentioned. On the one hand, Contracting Parties concluded that “[a] high degree of compliance with the provisions of the Convention was reported [...] in the National Reports”⁵²⁸; yet, on the other hand, there are several matters that arose during the Meeting that seems to partially contradict the previous statement. Indeed, it was reported that

[m]any Contracting Parties expressed concern regarding the human and financial resources available and their ability to recruit and train sufficient numbers of staff to meet the needs of the regulatory body [...], reported on the challenges of providing regulatory assessment of new designs and oversight of construction and commissioning of Nuclear Power Plants [and] on the challenges associated with assessing the safety of digital instrumentation and control systems and the need to exchange knowledge and experience among regulators on this issue⁵²⁹.

Is not this evidence of a self-acknowledgement of a lack of experience, qualification and knowledge of regulators? It should be recalled that the Convention on Nuclear Safety compels Contracting

⁵²⁵ IAEA (2011). Summary Report of the 5th Review Meeting of the Contracting Parties to the Convention on Nuclear Safety, 4-14 April 2011, CNS/RM/2011/6/FINAL, para. 9

⁵²⁶ These nine points ranged from “Nuclear power plant design against external events”, to “offsite response to emergency situation”, “communication in emergency situations” and “training of Nuclear Power Plant Operators for severe accidents scenarios”. See *Ibid.*, para. 12.

⁵²⁷ *Ibid.*, paras. 13-15.

⁵²⁸ *Ibid.*, para 22.

⁵²⁹ *Ibid.*, paras. 25,27,29.

Parties to establish regulatory bodies whose components must possess adequate competence, so what was stated above seems to be evidence of the non-compliance with this requirement, and if this requirement is not fulfilled, how can States respect their primary duty to ensure the safety of nuclear installations? Moreover, to the extent that regulatory deficiencies were one of the shortcomings that led to the mismanagement of the Fukushima crisis, the identification of these shortcomings is quite upsetting. Anyway, Contracting Parties committed to the “further enhancement of nuclear safety worldwide through actions to evaluate the Fukushima accident in Japan, identify lessons, and take appropriate actions”⁵³⁰, noting that taking steps is part of the obligations included in the Convention.

Within a different framework, that of the OECD Nuclear Energy Agency (NEA), the second important meeting dedicated to the analysis of the Fukushima accident and the lessons that could be drawn from it was the Forum on Insights and Approaches as a result of the Fukushima Accident. The Forum directly departed from the need expressed during the Fifth Review Meeting of international constructive collaboration aimed at enhancing the knowledge about the causes of the disaster, grasping lessons and applying them through concrete actions⁵³¹. Indeed, “[t]he main objectives of the forum were to provide the opportunity to exchange information on emerging lessons learnt, safety implications and national activities in response to the Fukushima accident, and to define areas where international co-operation could be of benefit”⁵³² and the issues that arose during the debates about present and future actions and challenges were to be used as valuable insights for the IAEA Ministerial Conference on Fukushima.

This Ministerial Conference took place less than two weeks after the NEA Forum, on 20th June 2011, with the purpose of carrying out a first preliminary evaluation of the disaster⁵³³ and its possible consequences on the nuclear safety, emergency preparedness and response, and radiation protection international regimes⁵³⁴, in terms of learning, improvement and strengthening. Particularly important is the result of the discussions held in Working Session 3. It specifically dealt

⁵³⁰ Ibid., para. 23.

⁵³¹ NEA Committee on Nuclear Regulatory Activities (2011). Proceedings of the Forum on the Fukushima Accident: Insights and Approaches, NEA/CNRA/R(2011)12, p. 5.

⁵³² Ibid.

⁵³³ This preliminary assessment was based on a report submitted by Japan which considered technical matters related to NPP safety, and emergency preparedness and response which stemmed from the analysis of the causes of the accident and lessons to be learnt, as well as the results of a IAEA International Fact Finding Mission. The latter included 15 conclusive remarks and 16 lessons to be learnt in order to enhance the level of nuclear safety worldwide. See IAEA (2011). Ministerial Conference on Nuclear Safety, 20-24 June 2011 – Report by the Director general, GOV/INF/2011/13-GC(55)/INF/10, pp. 4-5.

⁵³⁴ Burns S. G. (2018). ‘The impact of the major nuclear power plant accidents on the international legal framework for nuclear power’, in *Nuclear Law Bulletin*, Vol. 2018/2, No.101, p. 22.

with the consideration of the then-present nuclear safety regime and its possible enhancement. Considering the event of Fukushima, the Ministers came to the conclusion that the international framework on nuclear Safety had to be necessarily strengthened “to ensure the highest level of nuclear safety in every State that uses nuclear energy”⁵³⁵. Now, if a revision of the international framework on nuclear safety was needed in order to attain the highest standards of nuclear safety worldwide, it means that the framework, as it was at the time of Fukushima accident was not strong enough to meet said objective. To the extent that this is the primary goal of the Convention on Nuclear Safety and the meeting of its goals are periodically assessed through the review meetings, it is possible to argue that the peer review mechanism failed to identify shortcoming in the application of the Convention’s dispositions and to ensure the full meeting of the Convention’s objectives (though it allowed to achieve some considerable progresses). This may be due to the challenges related to the fact of relying solely on a mechanism of review meetings, identified in Chapter 2, to evaluate the compliance; in light of the events, it can be argued that this system is not enough to guarantee the attainment of the highest possible level of nuclear safety. In this regard, it is useful to recall what has been just remarked about the conclusions drawn during the Fifth Review Meeting. Anyway, at the Ministerial Conference, the Parties agreed on the fact that what had occurred at Fukushima should serve as a starting point to consider possible changes in the Convention on Nuclear Safety, and the improvement and more extensive use of the IAEA Safety Standards⁵³⁶.

This process of revision had to be guided by an Action Plan the Director General was asked to draft in the aftermath of the Ministerial Conference that had to be based on “the Ministerial Declaration, the conclusions and recommendations of the Working Sessions and the expertise and knowledge available therein”⁵³⁷. The Action Plan, as the name itself suggests, is a general roadmap, a work program to follow in order to achieve a comprehensive enhancement of the international safety regime. It is composed of twelve actions each of which has further sub-actions⁵³⁸. The twelve actions turn around the need to improve the emergency preparedness and response, also in terms of transparency, communication, spread of information, and the resilience of nuclear facilities in case of extreme events through the strengthening of the capabilities of regulatory authorities and

⁵³⁵ IAEA (2011). Ministerial Conference on Nuclear Safety, 20-24 June 2011 – Report by the Director general, GOV/INF/2011/13-GC(55)/INF/10

⁵³⁶ *Ibid.*, pp. 12.

⁵³⁷ *Ibid.*, p. 16.

⁵³⁸ IAEA (2011). Draft IAEA Action Plan on Nuclear Safety – Report by the Director General, GOV/2011/59-GC(55)/14, p. 2.

operating companies, as well as the improvement of the IAEA Safety standards and legal framework, also putting forward possible amendments, especially of the Convention on Nuclear Safety and Early Notification Convention⁵³⁹. Interestingly, none of the twelve points directly addressed the IAEA role. However, in the immediate aftermath of the disaster the statements of some observers, reported by Brumfiel, described the IAEA performance as “sluggish and sometimes confusing”⁵⁴⁰, because, the same Brumfiel remarks, for several days it kept providing short statements which merely contained sheer data without a clear contextualization⁵⁴¹. However, this behavior is not caused by inefficiency but it is the result of the IAEA assigned mandate, which, in light of the events, was deemed by some as inadequate. The fact that this shortcoming was not addressed during the meetings might reveal the State’s unwillingness to give the IAEA a more prominent role which constitutes an obstacle to the system improvement.

Concerning the possibility of amending the Convention on Nuclear Safety and Early Notification Convention, three different proposals were submitted by Russia, Switzerland⁵⁴² and Spain, regarding the former, while only Russia put forward a proposal to amend the latter. Put briefly, in the end no amendment was adopted. As Burns claims, “[t]his should not be viewed as a failure of the international system but the result of the necessary and ultimately more productive focus on technical criteria, mitigation measures and public protection, and the resulting improvement of the “soft law” guidance and standards arising out of the lessons learnt from the accident”⁵⁴³; indeed, even though no formal amendment was adopted, the simple fact that proposals were put forward shows the serious commitment on the part of the Contracting Parties to the Conventions to strengthen the regime and achieve progresses, which then materialized in the updating and re-

⁵³⁹ As listed in the report by the Director General, GOV/2011/59-GC(55)/14, the 12 actions are the following: 1. undertake assessment of the safety vulnerabilities of nuclear power plants in the light of lessons learned to date from the accident; 2. strengthen IAEA peer reviews in order to maximize the benefits to Member States; 3. strengthen emergency preparedness and response; 4. strengthen the effectiveness of national regulatory bodies; 5. strengthen the effectiveness of operating organizations with respect to nuclear safety; 6. review and strengthen IAEA Safety Standards and improve their implementation; 7. improve the effectiveness of the international legal framework; 8. facilitate the development of the infrastructure necessary for Member States embarking on a nuclear power programme; 9. strengthen and maintain capacity building; 10. ensure the on-going protection of people and the environment from ionizing radiation following a nuclear emergency; 11. enhance transparency and effectiveness of communication and improve dissemination of information; 12. effectively utilize research and development.

⁵⁴⁰ Brumfiel G. (2011). *Nuclear agency faces reform calls*. Available at: <https://www.nature.com/articles/472397a> (accessed: 2 April 2021).

⁵⁴¹ Ibid.

⁵⁴² The proposal of amendment submitted by Switzerland focused on the content of Articles 8, 14, 17, 18 and 19 which all contain dispositions that Japan failed to respect in the context of the Fukushima disaster. See Cavoski A. (2013). ‘Revisiting the Convention on Nuclear Safety: Lessons Learned from the Fukushima Accident’, in *Asian Journal of International Law*, Vol.3, No.2, p.388.

⁵⁴³ Burns S. G. (2018). ‘The impact of the major nuclear power plant accidents on the international legal framework for nuclear power’, in *Nuclear Law Bulletin*, Vol. 2018/2, No.101, p.24.

examination of soft law guidance documents which set the standards against which compliance with the Convention on Nuclear Safety should be assessed, and the adoption of the “Vienna Declaration on Nuclear Safety” that re-stated the importance of the respect of the principles contained in the Convention on Nuclear Safety⁵⁴⁴.

Yet, the Fukushima disaster had a strong impact not only on the legal framework for the regulation of nuclear energy production. The consequences on the population of the emergency exercised an important influence on the UN World Conference on Disaster Risk Reduction which took place in Sendai in 2015 and that gave rise to the Sendai Framework for Disaster Risk Reduction 2015-2030, a cornerstone in the field of IDRL. The place which was chosen to host the Conference is already indicative of the impact the disaster had on the event because Sendai was one of the Great East Japan Earthquake worst-hit cities⁵⁴⁵ and it is only 100 kilometers away from the Fukushima Daiichi NPP. Of course, the Sendai Framework adopts a broad point of view on disasters, so that nuclear disasters and other technological hazards were specifically tackled only in one session, in which, among other things, the Japanese representatives shared experiences and information about the manner in which the nuclear crisis was addressed and it served as a starting point for a process of careful consideration of the weaknesses that characterized the Fukushima disaster management, so that to internalize those lessons and avoid repetition⁵⁴⁶. According to Mosneaga, the fact of having dedicated little direct attention to the March 2011 disaster during the Conference constitutes a failure “to reflect more fully on the complex range of issues that were highlighted by the Fukushima accident”⁵⁴⁷. However, the legacy of that accident is well present and clear in the Sendai Framework. As a matter of fact, one of the main improvements from the Hyogo Framework is the considerable attention devoted to the issue of displacement that in the aftermath of the Fukushima nuclear emergency was the one of the main source of grief, distress and violation of human rights, a situation that was caused or exacerbated by poor communication with the affected population⁵⁴⁸ and a fundamental unpreparedness on the part of local and state authorities to manage such mass evacuations. Moreover, the circumstances were made even worse by the fact that Japanese authorities did not take into account people’s needs, fears, concerns and

⁵⁴⁴ Ibid., p.27.

⁵⁴⁵ Maly E., Suppasri A. (2020). ‘The Sendai Framework for Disaster Risk Reduction at Five: Lessons from 2011 Great East Japan Earthquake and Tsunami’, in *International Journal of Disaster Risk Science*, Vol. 11, p. 167.

⁵⁴⁶ Mosneaga A. (2015). *The Sendai Framework and Lessons from Fukushima*. Available at: <https://ourworld.unu.edu/en/the-sendai-framework-and-lessons-from-fukushima> (accessed: 4 April 2021).

⁵⁴⁷ Ibid.

⁵⁴⁸ In this context, the failure in the use of SPEEDI (System for Prediction of Environmental Emergency Dose Information) to enact precise evacuation orders should be recalled.

psychological conditions. In June 2011, the Japan's Reconstruction Design Council presented the project "Toward Reconstruction: Hope beyond the Disaster"⁵⁴⁹; the problem was that this project focused narrowly on the material reconstruction and decontamination, but this "hope beyond the disaster", a holistic recovery, can be achieved only combining the material rebuilding with an immaterial support, with communication and education provided to affected people; however, this latter aspect was missing in the plan⁵⁵⁰. In this sense, disaster risk reduction passes also through the idea of "building back better for people"⁵⁵¹. In a way, this experience was instrumental and served to understand which criticalities had to be addressed at the Sendai Conference:

[the] Fukushima accident [was seen] as a 'living example' that underlines the importance of addressing displacement holistically in the context of DRR. That is, not only addressing it as a matter of prevention and preparedness but also as an issue of longer-term recovery and resilience. Specifically, experiences from Fukushima and other large-scale disasters at industrial facilities indicate a pressing need for measures to rebuild livelihoods, compensation mechanisms, relocation schemes and environmental remediation operations from the very early stages of recovery. [...] Regular opportunities to reflect on residents' needs and concerns should be supported with sufficient resources, close coordination between key stakeholders and transparent, balanced moderation of consultations⁵⁵².

In this sense, the Sendai Framework adopts a stronger human-based approach to DRR, also following in the footsteps of the work of the ILC on the Draft Articles for the Protection of Persons the Event of Disasters, and pays particular attention to the increase of vulnerable people resilience acknowledging that "[d]isaster risk reduction practices need to be multi-hazard and multisectoral, inclusive and accessible in order to be efficient and effective"⁵⁵³. Finally regarding this last quotation, Takamura et al. argue that it is widely acknowledged that it is exactly the Fukushima

⁵⁴⁹ Maly E., Suppasri A. (2020). 'The Sendai Framework for Disaster Risk Reduction at Five: Lessons from 2011 Great East Japan Earthquake and Tsunami', in *International Journal of Disaster Risk Science*, Vol. 11, p. 173.

⁵⁵⁰ The plan did not consider the need to provide psychological support to affected people and this failed to contribute to solve the problem of alcoholism and suicide cause by post-traumatic conditions. Moreover, other fundamental aspects that are absent are women empowerment and reduction of gender inequalities that played a critically negative role in the Fukushima post-disaster phase (see next Chapter for further details). See Maly E., Suppasri A. (2020). 'The Sendai Framework for Disaster Risk Reduction at Five: Lessons from 2011 Great East Japan Earthquake and Tsunami', in *International Journal of Disaster Risk Science*, Vol. 11, p. 174.

⁵⁵¹ *Ibid.*, p. 175.

⁵⁵² Mosneaga A. (2015). *The Sendai Framework and Lessons from Fukushima*. Available at: <https://ourworld.unu.edu/en/the-sendai-framework-and-lessons-from-fukushima> (accessed: 4 April 2021)

⁵⁵³ UN (2015). *Sendai Framework for Disaster Risk Reduction 2015-2030*, p.10.

disaster, which can be considered as a triple disaster, involving a destructive earthquake, tsunami and nuclear accident that pushed towards the adoption of such a multi-hazard approach. It implies that risks, regardless of their source, whether natural or man-made does not have to be considered in isolation from each other, but as interrelated⁵⁵⁴.

2.3. The impact of the Fukushima accident on the nuclear energy production industry.

At the turn of the century, when the shock caused by the Chernobyl accident started to be an old memory, a new phase of “nuclear renaissance” began since an increasing number of countries expressed their intention to increase their nuclear capacity or introduce plans to inaugurate a new domestic nuclear industry⁵⁵⁵. However, the global financial crisis of 2008 stuck a hard blow to these plans as investments dramatically shrunk and only three years later the Fukushima nuclear accident occurred and in some cases it constituted a pivotal game changer. In this sense, the disaster affected not only the underlying legal framework for nuclear energy production but also the nuclear industry itself, even though the two things are connected: in virtually all countries that still had nuclear facilities, wanted to increase their nuclear capacity, or were planning to build them considerable delays and obstacles arose because of the undertaking of safety reviews and design modifications that were necessary to strengthen NPP resilience against extreme natural events⁵⁵⁶, but also to assuage people’s increasing opposition to nuclear energy that imply considerable costs. Anyway, it should be said that there are other factors other than the global financial crisis and the Fukushima accident that cause delays of even the repeal of nuclear development projects, such as the decreasing price of fossil fuels⁵⁵⁷.

As far as nuclear policies in East and Southeast Asia are concerned, that, because of the geographical closeness, could potentially be the most affected region by the consequence of the accident, it seems that long-term projects have not been changed considerably, especially in Southeast Asia where the willingness to include nuclear energy in the energy mix has not decreased, mainly because

⁵⁵⁴ Takamura et al. (2019). *Eight years after Fukushima nuclear accident – Community recovery and reconstruction from nuclear and radiological disasters – a case of Kawauchi village and Tomioka town in Fukushima*. Available at: <https://www.undrr.org/publication/eight-years-after-fukushima-nuclear-accident-community-recovery-and-reconstruction> (accessed: 5 April 2021).

⁵⁵⁵ Nelson P. (2010). ‘Reassessing the nuclear renaissance – A historical perspective reveals some unanticipated possibilities for the next 20 years’, in *Bulletin of the Atomic Scientists*, July/August 2010, pp. 11-22.

⁵⁵⁶ NEA (2017). Impacts of the Fukushima Daiichi Accident on Nuclear Development Policies, NEA No. 7212. OECD-NEA.

⁵⁵⁷ Ibid.

of the need to face a rapid rise in energy demand triggered by increasing rates of economic growth and population⁵⁵⁸. Considering Japan, however, the 2010 announced target for the increase in the production of nuclear energy up to the 30-50% of the total domestic production of electricity was substantially revised and lowered: in 2015 it was announced that the percentage would amount to only 20-22%⁵⁵⁹. This change was dictated by the nationwide general opposition to nuclear energy that surged after the March 2011 disaster⁵⁶⁰. In order to reassure the Japanese public about the commitment of Japanese authorities toward the maximum degree of nuclear safety, but also to more fully comply with the disposition of the Convention on Nuclear Safety and international community appeals, the Japanese government undertook a process of restructuring of the nuclear regulatory bodies: a new Nuclear Regulatory Authority was created and it substituted NISA and the NSC; it was placed under the Ministry of Environment in order to address the criticisms about the conflict of interests and lack of independence that characterized NISA, being placed under the Ministry of Economy, Trade and Industry that was charged with the promotion of nuclear energy⁵⁶¹; it was also established that the personnel of the new body had to be adequately trained⁵⁶². Japan took also steps autonomously to reform its domestic legislative framework: the Reactor Regulation Act was reviewed to include clear dispositions on extreme natural events, critical emergency procedures and improvement of the nuclear safety culture. Moreover, the drafting of new standards that drew from international guidelines and in particular the IAEA Safety Standards was mandated⁵⁶³. Finally, before being dismantled, NISA called for the undertaking of stress tests, following in EU's footsteps, with the purpose of re-evaluating the overall safety of Japanese NPP⁵⁶⁴. The geographical region that seems to have been mostly affected by the Fukushima accident is Western Europe. Here, the most radical decision was taken by Germany which chose to decommission eight reactors for good and to reduce the life cycle of all the other facilities, thus planning to put a definitive end to the German nuclear era in 2022 and turn completely to renewable

⁵⁵⁸ Ibid.

⁵⁵⁹ Ibid.

⁵⁶⁰ A survey carried out by the Asahi Shimbun newspaper in 2016 revealed that 57% of the population opposes the restart of the NPP that were temporarily shut down after the accident of Fukushima to conduct safety reviews, and trust toward the government authorities and nuclear operator has plunged. See Ryall J. (2016). *Opposition to nuclear energy grows in Japan*. Available at: <https://www.dw.com/en/opposition-to-nuclear-energy-grows-in-japan/a-36110302> (accessed: 6 April 2021).

⁵⁶¹ World Nuclear News (2012). *New Japanese regulator takes over*. Available at: https://www.world-nuclear-news.org/RS-New_Japanese_regulator_takes_over-1909125.html (accessed: 15 March 2021)

⁵⁶² Cavoski A. (2013). 'Revisiting the Convention on Nuclear Safety: Lessons Learned from the Fukushima Accident', in *Asian Journal of International Law*, Vol.3, No.2, p. 388.

⁵⁶³ Ibid., P. 389

⁵⁶⁴ Ibid.

resources⁵⁶⁵. Belgium decided to give up the idea of extending the operation of its three most ancient reactors, and in France, the second largest producer of nuclear energy⁵⁶⁶, the government decided to enact a new law providing for a cap on nuclear energy generation, which corresponded to the 2011-2012 levels, as a consequence of the renewed policy debate on nuclear energy and the rising concerns of the population about nuclear safety in the aftermath of the Fukushima accident⁵⁶⁷. It should be said that these policy moves were already in the air, but what occurred in Japan caused a sharp acceleration in their enactment and implementation⁵⁶⁸. Considerable steps were also taken at the EU level which, for instance, in 2011, mandated the carry-out of stress tests to evaluate the safety of NPP within the EU territory⁵⁶⁹.

The United States, the current largest nuclear energy producer, did not change its priorities and plans as a result of the Fukushima accident; adjustments in the nuclear policy were instead the consequence of changes in the prices of oil and natural gas⁵⁷⁰. Nevertheless, what was triggered by the March 2011 event was the constitution of a task force by the Nuclear Regulatory Commission that was entrusted with the task of “[evaluating] the implications of the accident for US plants and ultimately [requiring] measures to improve plant equipment, [enhancing] capability to cope with severe accidents, and [re-evaluating] natural hazards such as seismic and flooding events that could adversely affect plants”⁵⁷¹.

In order not to focus too much on the single moves or initiatives taken by States all over the world, it suffices to say that, as the report submitted by the NEA in 2017, in the Middle East, Central and South Asia, Eastern Europe, Africa and North, Central and South America, governments remained committed to the production and/or development of nuclear energy. However, in virtually all cases, safety reviews and tests were carried out, also as a result of the conclusions reached during meetings and conferences analyzed above. What still needs to be assessed is the impact of the new safety regulations and standards introduced both at the international level but also in many national

⁵⁶⁵ Réseau Action Climat (2015). *Nuclear Power: a False Solution to Climate Change*. Available at: https://www.sortirdunucleaire.org/IMG/pdf/rac-2015-nuclear_power-a_false_solution_to_climate_change.pdf (accessed: 10 April 2021).

⁵⁶⁶ Power Technology (2021). *Top ten nuclear energy-producing countries*. Available at: <http://www.power-technology.com/features/top-ten-nuclear-energy-producing-countries/> (accessed: 10 April 2021).

⁵⁶⁷ NEA (2017). *Impacts of the Fukushima Daiichi Accident on Nuclear Development Policies*, NEA No. 7212. OECD-NEA, p.12.

⁵⁶⁸ Ibid.

⁵⁶⁹ Burns S. G. (2018). ‘The impact of the major nuclear power plant accidents on the international legal framework for nuclear power’, in *Nuclear Law Bulletin*, Vol. 2018/2, No.101, p. 24.

⁵⁷⁰ NEA (2017). *Impacts of the Fukushima Daiichi Accident on Nuclear Development Policies*, NEA No. 7212. OECD-NEA, p.13.

⁵⁷¹ Burns S. G. (2018). ‘The impact of the major nuclear power plant accidents on the international legal framework for nuclear power’, in *Nuclear Law Bulletin*, Vol. 2018/2, No.101, p. 24.

contexts: stricter standards and regulations means an increase in the costs of maintenance which might disincentivize investments in the sector, unless subsidies are granted, a possibility that opens a broad political debate.

Chapter 4

Nuclear energy and violations of human rights: an analysis starting from the Chernobyl and Fukushima cases.

1. Possible human rights violations in case of radioactive exposure.

When nuclear accidents occur or people are exposed to undue radioactive sources, the enjoyment of several human rights is at risk. This Chapter aims at exploring what rights are particularly jeopardized and why. The following analysis will always make reference to the Chernobyl and Fukushima accidents, as real cases. However, the fact of departing from these two empirical events is not meant to be a simple and sterile description of the human rights violations that occurred in the event of the two accidents, but the main purpose is to shed light on the preconditions and deficiencies that triggered them, in order to recognize the risk factors that can lead to the same violations in the future.

1.1. The Right to Health and the Right to Life: how the distinction between the two blurs in the event of a heavy radiological exposure.

The first human right whose enjoyment might be jeopardized in the context of nuclear energy production is the right to life because of the effect of undue exposure to high doses of radiations caused by governmental negligence. In the case of the right to life, it is important to point out that, contrarily to other human rights, violations can occur not only in the event of nuclear accidents involving nuclear facilities, but also in the case of a meaningful radiation exposure that can arise in connection to extraction of uranium, or other radioactive materials, or waste management. In other words, violations of the right to life might derive from any phase of the nuclear fuel cycle⁵⁷².

However, the important point that will be explored in this section is that in the specific case of nuclear accident, mainly as a result of authorities' lack of preparedness and inability to undertake appropriate preventive measures, there is a rather strong intertwinement between the right to

⁵⁷² The nuclear fuel cycle comprises different phases: mining, milling, conversion, enrichment, fuel fabrication for the use in nuclear reactors, interim storage, and final disposition. See U.S. Energy Information Administration (2020). *Nuclear explained – The nuclear fuel cycle*. Available at: <https://www.eia.gov/energyexplained/nuclear/the-nuclear-fuel-cycle.php> (accessed: 12 April 2021).

health and the right to life. Nevertheless, before exploring this connection, it is useful to delve into the specific content and violations of the single rights.

1.1.1. Violation of the right to life.

In order to understand how the right to life is jeopardized in case of considerable radiation exposure, some preliminary observations have to be underlined. First, for radiation exposure, we distinguish between protracted exposure and acute exposure⁵⁷³. The former refers to a rather long-term exposure but to lower-intensity doses of radiation; the latter, instead, indicates a short-term exposure but to significantly higher levels of radiations. In simple words, in the aftermath of a nuclear accident emergency workers might be subjected to acute exposure if they are not suitably equipped, while the general population within a certain radius is more exposed to protracted exposure, if not promptly evacuated. Now, it has been scientifically shown that for doses higher than 50-100 mSv in case of protracted exposure, and 10-50 mSv for acute exposure, there is a considerable rise in the risk of developing some neoplastic diseases⁵⁷⁴.

Yet, the most important information linked to this distinction is the following: “[t]he underlying dose-response relationship is linear with no threshold. In other words, radiation exposure is always considered to pose some level of risk (albeit very small at low doses), and the sum of several very small exposures is assumed to have the same effect as one larger exposure of the same overall magnitude”⁵⁷⁵. From this excerpt, it is possible to derive three important pieces of information: first, any radiation dose is potentially dangerous. Now, someone may wonder why some specific thresholds have just been mentioned in relation to an increase in cancer risk; the answer is easy: the lower the exposure in terms of time and intensity, the more difficult it is to establish a possible causal link between the illness and radiations. In other words, in correspondence of the threshold indicated above, the likelihood that the insurge of cancers or other diseases linked or caused radiation exposure is higher. The second important piece of information is that the risks attached to protracted and acute exposure are the same, namely a single dose equal to 50 mSv (acute exposure), and the cumulative sum of successive smaller doses whose total is 50 mSv can lead to

⁵⁷³ Evangeliou N, et al. (2014). ‘Global and local cancer risks after the Fukushima Nuclear Power Plant accident as seen from Chernobyl: A modeling study for radiocaesium (¹³⁴Cs & ¹³⁷Cs)’, in *Environment International*, Vol.64, p.17.

⁵⁷⁴ Ibid.

⁵⁷⁵ WHO (2013). *Health risk assessment from the nuclear accident after the 2011 Great East Japan Earthquake and Tsunami based on a preliminary dose estimation*. Available at: <https://www.who.int/publications/i/item/9789241505130> (accessed: 12 April 2021).

the same medical consequences. Third and most importantly, when it comes to radiation exposure, time is fundamental because of the accumulation effect. All these points are instrumental to understand the importance of emanating prompt and clear evacuation orders in case of nuclear emergencies. In addition, when people think about radiation exposure, the first thought goes to body exposure, so a form of external contact; however, radionuclides, that might be responsible for cellular DNA damage that can cause cancer, can also be ingested through contaminated food and beverages and/or inhaled⁵⁷⁶.

The last preliminary consideration concerns the fact that, radiation exposure being equal, some individuals are more susceptible to radiations than other because of biological features. Indeed, women and children are more vulnerable: both are characterized by a higher cell division rate (children because of their process of physical growth, while in women, as well as being a natural mechanism, the increase in cell division is particularly marked during pregnancy for obvious reasons and in that case radiations are dangerous both for the mother and the fetus that is growing), and women are more at risk also because of factors related to hormones and specific genes⁵⁷⁷. As a consequence, they need special care that should also be reflected in policy provisions related to emergency preparedness and response.

The right to life is enshrined in Article 6 of the International Covenant on Civil and Political Rights. It is also included in other instruments, such as the American Convention on Human Rights (Article 4), the European Convention on Human Rights (Article 2), the African Charter on Human and Peoples' Rights (Article 4) and the non-binding Universal Declaration of Human Rights. However, being the European Convention and American Convention two regional instruments and the Universal Declaration a soft law instrument, though it is a milestone in the development of a human right regime, the following analysis on how the negligence in the management of activities related to the production of nuclear energy affects the right to life is based on Article 6 of the International Covenant on Civil and Political Rights. Paragraph 1 of Article 6 states that "[e]very human being has the inherent right to life. This right shall be protected by law. No one shall be arbitrarily deprived of his life". The wording is very clear, the only term which requires a specification is "arbitrarily" so the notion of arbitrariness which, in this context, "[...]must be interpreted more broadly to include

⁵⁷⁶ Evangeliou N, et al. (2014). 'Global and local cancer risks after the Fukushima Nuclear Power Plant accident as seen from Chernobyl: A modeling study for radiocaesium (¹³⁴Cs & ¹³⁷Cs)', in *Environment International*, Vol.64, pp. 17-27.

⁵⁷⁷ Claussen A. (2020). *Uranium in also a feminist issue*. Available at: <https://www.rosalux.de/en/publication/id/41673/uranium-is-also-a-feminist-issue/> (accessed: 12 April 2021).

elements of inappropriateness, injustice, lack of predictability, and due process of law as well as elements of reasonableness, necessity, and proportionality”⁵⁷⁸.

As immediately underlined by the Human Rights Committee in its General Comment No.36 (2018) which delves into the specific content of the Right to Life as intended in the International Covenant on Civil and Political Rights, the right to life can be considered as the supreme right also because it is fundamental, a precondition, to benefit also from all other human rights, and, as such, recalling the content of Article 4 of the same Covenant, no derogations to it are allowed even in case of public emergencies, such as a nuclear accident⁵⁷⁹.

Going in depth into the specific nuances and facets of the right to life, the Human Rights Committee, in the abovementioned General Comment which will actually be the basis of the present discussion, holds that “[t]he right to life is a right which should not be interpreted narrowly. It concerns the entitlement of individuals to be free from acts and omissions that are intended or may be expected to cause their unnatural or premature death, as well as to enjoy a life with dignity”⁵⁸⁰. This statement is important for two reasons: first, it talks about omissions that may cause an unnatural or premature death; in light of what has been shown about the conduct of both the Soviet Union and Japan in the context of the two nuclear accidents, it can be reasonably stated that they are responsible of omissions and negligence the result of which led to a nuclear disaster or at least the exacerbation of an already tragic situation, and the obvious ensuing release of radioactive materials that are rather likely to have had an extremely dangerous and negative effects on the health of human beings. Here, the second important aspect can be pointed out: the infinite list of diseases that can arise from a considerable radiation exposure might not cause death but they anyway constitute an obstacle to the enjoyment of a life with dignity which, according to the Human Rights Committee, constitutes a violation of the right to life.

Few lines above, omissions and negligence of Japan and the URSS regarding the outbreak of the crisis have been recalled, but relevant omissions that had an impact on people’s right to life can be identified also in the immediate aftermath of the disaster, in relation to the emergency response. Regarding the Chernobyl accident and specifically the evacuation of the most contaminated areas Steinhauser, Brandl and Johnson report that roughly 116,000 people who lived in the so-called

⁵⁷⁸ Human Rights Committee (2018). General Comment No.36 (2018 on article 6 of the International Covenant on Civil and Political Rights, on the right to life – CCPR/C/GC/36, para.2.

⁵⁷⁹ Ibid., para.12.

⁵⁸⁰ Ibid., para.3.

exclusion zone⁵⁸¹, the most contaminated area around the NPP, were evacuated and ordered to head to areas where the radioactive contamination was lower, but, as they point out, this occurred in the months following the disaster. When the levels of radioactivity are so high as they were in the exclusion zone after the accident, months or even weeks are an eternity if we consider what was described above about the accumulation of radiations in the human body. Always Steinhauser, Brandl and Johnson add that, actually, the evacuation operations started on the 29th of April, three days after the disaster but for people living in areas that received the highest doses of radiation it was already too late⁵⁸². Then, in the following *years* [emphasis added] other 220,000 people were displaced⁵⁸³, but they are only a total of 336,000 people approximately out of the 400,000 people who lived in the “strict radiation control” territories and of the 5 million people who live in the zones classified as contaminated of Belarus, Russia and Ukraine⁵⁸⁴. It is clear that appropriate measures to ensure affected people’s legitimate enjoyment of the right to life were not undertaken, and the same General Comment explicitly says that Contracting Parties have the obligation to take legislative or any other measure necessary to “respect and ensure the right to life”⁵⁸⁵.

A similar analysis can be carried out for Japan. It must be said that in this case the evacuation was much faster but the two situations are hardly comparable: in 25 years, knowledge, means of communication, organizational structures and technical means changed dramatically. Anyway, in a country like Japan where the geological risks is very elevated and the nuclear industry is one of the most developed worldwide (in terms of GW produced, not technological advancement), the lack of a multi-hazard approach to emergency preparedness, whose importance was then strongly underlined in the Sendai Framework, caused considerable damage. On 11th March, six hours after TEPCO reported the loss of power generators to run the cooling system and the rapid deterioration of the situation, people living within 3km radius from the NPP were ordered to evacuate. As the severeness and dangerousness of the situation increased the evacuation was extended the following day, thus comprising an area of 20km radius, while an “indoor evacuation zone” was established in the area between 20km and 30km radius. In this zone, the level of alertness was then

⁵⁸¹ The exclusion zone included all the territories within the radius of 30km from the NPP, which correspond approximately to an area of 2,800 km². See Steinhauser G., Brandl A., Johnson T. E. (2014). ‘Comparison of the Chernobyl and Fukushima nuclear accidents: a review of the environmental impacts’, in *Science of the Total Environment*, Vol. 470-471, p. 803.

⁵⁸² Ibid.

⁵⁸³ IAEA (2006). *Chernobyl’s Legacy: Health, Environmental and Socio-Economic Impacts and Recommendations to the Governments of Belarus, the Russian Federation and Ukraine*. Second revised version. Vienna:IAEA, p.10,11.

⁵⁸⁴ Ibid.

⁵⁸⁵ Human Rights Committee (2018). General Comment No.36 (2018 on article 6 of the International Covenant on Civil and Political Rights, on the right to life – CCPR/C/GC/36, para. 4.

raised and became an “evacuation prepared zone”, but an evacuation order was never enacted⁵⁸⁶. The problem was that the evacuation orders were given without the support of the System for Prediction of Environmental Emergency Dose Information (SPEEDI), that was developed exactly to enable authorities to receive important forecasts about the spread of radioactive particles in order to act accordingly. The failure to take advantage of this system was due to the fact that the Nuclear Safety Commission and MEXT, the Ministry of Education, Culture, Sports, Science and Technology deemed data unreliable, therefore they did not communicate it to those who issued the evacuation orders. The result was that many people evacuated in the same direction as radioactive materials transported by the wind⁵⁸⁷ and, always because of wind patterns, an area beyond the 20km radius “no-entry zone”, subject to high contamination, was not evacuated, but it was simply declared “deliberate evacuation area”⁵⁸⁸. In brief, Japanese people in the Fukushima prefecture were exposed to radiations as a consequence of the government unpreparedness. This conduct goes against what stated by the Human Rights Committee: “[t]he obligation of States parties to respect and ensure the right to life extends to reasonably foreseeable threats and life-threatening situations that can result in loss of life. States parties may be in violation of article 6 even if such threats and situations do not result in loss of life [emphasis added]”⁵⁸⁹.

Unfortunately, omissions by State authorities that can amount to an arbitrary deprivation of life do not stop here. It should be recalled that radiation exposure occurs as a consequence of external exposure, inhalation and ingestion. The issue of ingestion is particularly relevant. Regarding the Chernobyl disaster, of course radioactive particles deposited everywhere on the soil and on cultivated crops and mushrooms⁵⁹⁰. The soil contamination then transferred to cattle (which was also subject to external exposure) and from cattle to meat and milk, as well as to subsequent crops

⁵⁸⁶ See Steinhauser G., Brandl A., Johnson T. E. (2014). ‘Comparison of the Chernobyl and Fukushima nuclear accidents: a review of the environmental impacts’, in *Science of the Total Environment*, Vol. 470-471, p. 804-806; The Sasakawa Peace Foundation (2012). *The Fukushima nuclear accident and crisis management - Lessons for Japan-U.S. Alliance Cooperation*. Akasaka: The Sasakawa Peace Foundation, p.12.

⁵⁸⁷ *Ibid.*, p. 24.

⁵⁸⁸ Steinhauser G., Brandl A., Johnson T. E. (2014). ‘Comparison of the Chernobyl and Fukushima nuclear accidents: a review of the environmental impacts’, in *Science of the Total Environment*, Vol. 470-471, p. 806.

⁵⁸⁹ Human Rights Committee (2018). General Comment No.36 (2018 on article 6 of the International Covenant on Civil and Political Rights, on the right to life – CCPR/C/GC/36, para. 7.

⁵⁹⁰ Mushrooms are mentioned because in some Soviet rural areas, the tradition of collecting wild forest mushrooms was really deep-rooted. See Steinhauser G., Brandl A., Johnson T. E. (2014). ‘Comparison of the Chernobyl and Fukushima nuclear accidents: a review of the environmental impacts’, in *Science of the Total Environment*, Vol. 470-471, p. 811.

through the absorption of substance by plants roots⁵⁹¹. Therefore, the population in the most contaminated areas of Belarus, Russia and Ukraine, which was for the most part a rural population based in part on an autarkic organization, so that each household provided for its own subsistence through agriculture and farming, found itself in a situation of very high internal contamination caused by the ingestion of radioactive foodstuff⁵⁹². Steinhäuser, Brandl and Johnson argue that “[w]arnings not to consume milk from local livestock were issued days after the accident. Even years after the accident, milk remained the major route for intake of ¹³⁷Cs and contributed more than 50% to the average intake”⁵⁹³. Why did not people refrain from consuming potentially contaminated food, if they had been advised about their dangerousness? There are two main reasons: first, information provided by competent authorities was scant⁵⁹⁴, also due to poor communication networks, and poorly understandable by normal people who consequently underestimated the risk because of lack of knowledge; second, even though the risk was perceived, people had few alternatives, or better no alternatives were offered to them: self-production of primary foodstuff was their main means of subsistence and they could not afford to throw it away, unless material help was provided, but it was not: intake of contaminated food was the result of having no choice. Repercussions were particularly dire for children who drank considerable amounts contaminated milk and are more susceptible to radiations.

Regarding Fukushima, instead, the issue of protection from food contamination is more controversial. Several scholars point out how in the immediate aftermath of the disaster, the Japanese health authorities ordered the testing of the highest possible number of food and water samples at local level, involving also laboratories in universities and research institutes⁵⁹⁵, so that products that exceeded the limit of radioactivity imposed by regulators were withdrawn from the market⁵⁹⁶. However, many testimonies of affected people reported that they expected experts and scientists to come and analyze their food in order to understand whether it was safe to consume it

⁵⁹¹ Otaki J. M. (2016). ‘Fukushima’s Lessons from the Blue Butterfly: a Risk Assessment of the Human Living Environment in the Post-Fukushima Era’, in *Integrated Environmental Assessment and Management*, Vol. 12, No. 4, pp. 667-672.

⁵⁹² Steinhäuser G., Brandl A., Johnson T. E. (2014). ‘Comparison of the Chernobyl and Fukushima nuclear accidents: a review of the environmental impacts’, in *Science of the Total Environment*, Vol. 470-471, p. 811.

⁵⁹³ *Ibid.*, pp. 811-812.

⁵⁹⁴ Evangelidou N, et al. (2014). ‘Wildfires in Chernobyl-Contaminated forests and risks to the population and the environment: a new nuclear disaster about to happen?’, in *Environment International*, Vol.73, p.25.

⁵⁹⁵ Steinhäuser G., Brandl A., Johnson T. E. (2014). ‘Comparison of the Chernobyl and Fukushima nuclear accidents: a review of the environmental impacts’, in *Science of the Total Environment*, Vol. 470-471, p. 812.

⁵⁹⁶ WHO (2013). *Health risk assessment from the nuclear accident after the 2011 Great East Japan Earthquake and Tsunami based on a preliminary dose estimation*. Available at: <https://www.who.int/publications/i/item/9789241505130>, p. 12 (accessed: 20 March 2021).

but they declared that "no experts who knew about measuring radiation came to us. It was chaos"⁵⁹⁷. In this situation, Fukushima's mothers, who felt abandoned by State institutions and were extremely concerned about the possible repercussions of radioactive food intake for the health and life of their children, decided to study in order to be able to set up and run fully-fledged laboratories to test their food⁵⁹⁸. To this, it is necessary to add that, as Funabashi and Kitazawa note, "[t]he majority of the general population had no idea of the meaning behind the reported radiation levels. There was no yardstick against which to judge whether or not the levels were dangerous. The government made no effective effort to educate or soothe the public in this regard"⁵⁹⁹. Accordingly, many people are supposed to have ingested contaminated food because they did not have the knowledge to understand the risks associated to it. Evangeliou et al., in particular, mention the situation in small fishermen communities where individuals might have consumed considerable amount of fish contaminated by the discharge of radioactive water from the NPP, as a consequence of lack of appropriate information and awareness⁶⁰⁰.

Finally, there is the issue of stable Iodine. In cases of radiation exposure, stable iodine is essential in order to reduce the adsorption of radiations by the thyroid, thus reducing the likelihood of thyroid cancer. Now, after the Chernobyl disaster, stable iodine tablets were distributed to the people living in Pripjat⁶⁰¹, the closest city to the nuclear facility, but the areas affected by extremely dangerous radiation levels were far more extended. Even though data of a more extensive supply is reported in a few publications, the validity of the information itself has been put into question and anyway it has been solidly demonstrated how the measures reported would be rather ineffective because undertaken too late⁶⁰². In the case of Fukushima the situation was not different, in the sense that governmental authorities distributed stable iodine tablets, but its consumption was not officially recommended, nor was the importance of its administration explained. As a consequence it has been estimated that only a very small portion of the affected population actually took it. In both

⁵⁹⁷ Sturmer J., Asada Y. (2019). *Fukushima's mothers became radiation experts to protect their children after nuclear meltdown*. Available at: <https://www.abc.net.au/news/2019-05-12/fukushima-mums-teach-themselves-how-to-be-radiation-experts/11082520> (accessed: 21 March 2021).

⁵⁹⁸ Ibid.

⁵⁹⁹ Funabashi Y., Kitazawa K. (2012). 'Fukushima in a review: a complex disaster, a disastrous response', *Bulletin of Atomic Scientists*, Vol.68, No.2, p.11.

⁶⁰⁰ Evangeliou N. et al. (2014). 'Wildfires in Chernobyl-Contaminated forests and risks to the population and the environment: a new nuclear disaster about to happen?', in *Environment International*, Vol.73, pp.346-358.

⁶⁰¹ WHO (2013). *Health risk assessment from the nuclear accident after the 2011 Great East Japan Earthquake and Tsunami based on a preliminary dose estimation*. Available at: <https://www.who.int/publications/i/item/9789241505130>, p. 13 (accessed: 20 March 2021).

⁶⁰² Steinhäuser G., Brandl A., Johnson T. E. (2014). 'Comparison of the Chernobyl and Fukushima nuclear accidents: a review of the environmental impacts', in *Science of the Total Environment*, Vol. 470-471, p. 806.

events, this omission caused a non-irrelevant increase in the cases of thyroid cancers (especially in children and adolescents the increase was consistent), which is some occasions proved mortal⁶⁰³.

There is a specific excerpt of the General Comment No. 36 that is fundamental in light of what has just been described about the management of the nuclear emergencies; it says that “States parties should also develop, when necessary, contingency plans and disaster management plans designed to increase preparedness and address natural and man-made disasters, which may adversely affect enjoyment of the right to life, such as [...] radio-active accidents”⁶⁰⁴. In this sense, disaster preparedness is fundamental for the protection of the right to life as Chernobyl and Fukushima dramatically demonstrated, since the lack of organization and readiness to face such complex emergencies led to the main violations of the right to life.

As anticipated, the right to life is jeopardized not only in the aftermath of nuclear accidents. Every time a radiation exposure occurs as a consequence of someone else’s conscious actions or omissions, there can be a violation. In this regard, the issue of uranium mining is worth of mention. Claussen claims that the biggest share of uranium is and has always been extracted in territories where indigenous and extremely poor people live⁶⁰⁵. Because of the living standards of these people, it is not difficult for multinationals to compel them to work in precarious safety conditions. As a result, a considerable number of studies in the field of medicine showed the detrimental consequences on the health of these uranium miners. However, radiations affects not only direct miners but also the populations who live in the vicinity of mines. “It can be assumed that in the immediate vicinity of almost all uranium mines, severely malformed, non-viable infants will be born, and that the risk of cancer is drastically increased”⁶⁰⁶, as well as other disabling diseases. In particular, evidence of very serious health effects on the Wind River Indian Reservation native

⁶⁰³ See WHO (2013). *Health risk assessment from the nuclear accident after the 2011 Great East Japan Earthquake and Tsunami based on a preliminary dose estimation*. Available at:

<https://www.who.int/publications/i/item/9789241505130>, p. 14-15 (accessed: 20 March 2021); Nagataki S., Yamashita S. (2017). Thirty Years After the Chernobyl Nuclear Power Plant Accident: Contribution from Japan- “Confirming the Increase of Childhood Thyroid Cancer”, in Yamashita S., Thomas G. (eds.) *Thyroid Cancers and Nuclear Accidents – Long-term Aftereffects of Chernobyl and Fukushima*. London: Elsevier Inc. p. 11-19.

⁶⁰⁴ Human Rights Committee (2018). General Comment No.36 (2018 on article 6 of the International Covenant on Civil and Political Rights, on the right to life – CCPR/C/GC/36, para. 26.

⁶⁰⁵ Some of the most relevant countries involved in the extraction of Uranium are Namibia, South Africa, Niger, Uzbekistan, Kazakhstan, Botswana, Tanzania and Jordan which all together are 0.86% of the world GDP. See IAEA-NEA (2020). *Uranium 2020: Resources, Production and Demand*. Available at: https://www.oecd-nea.org/upload/docs/application/pdf/2020-12/7555_uranium_-_resources_production_and_demand_2020_web.pdf (accessed: 22 March 2021) and Claussen A. (2020). *Uranium in also a feminist issue*. Available at: <https://www.rosalux.de/en/publication/id/41673/uranium-is-also-a-feminist-issue/>,

(accessed: 12 March 2021).

⁶⁰⁶ Claussen A. (2020). *Uranium in also a feminist issue*. Available at: <https://www.rosalux.de/en/publication/id/41673/uranium-is-also-a-feminist-issue/>, (accessed: 12 March 2021).

population, who lived close to a uranium mine and radioactive wastes that were abandoned, was reported in a 2017 epidemiological study carried out by the Wind River Environmental Health Initiative⁶⁰⁷. Now, since in some cases uranium mining is managed by private companies, it should be recalled that anyway “States parties [to the International Covenant on Civil and Political Rights] must also ensure the right to life and exercise due diligence to protect the lives of individuals against deprivations caused by persons or entities, whose conduct is not attributable to the State”⁶⁰⁸. This statement is linked with the enduring debate on the possibility that Transnational Companies, like those that are involved in uranium extraction and enrichment, are subject of international law or not and whether, as a consequence, possess rights and obligations under international law. This issue will be tackled more in detail, at the end of this chapter in section 4.

Yet, what are the material health effects that arose after the Chernobyl and Fukushima Nuclear accidents because of radiation exposure and that led to violations of the right to life? The list of illnesses that are potentially deadly or that anyway can prevent people from “enjoying a life with dignity” is long. In the cases of higher exposure, estimates of the post-Chernobyl epidemiological situation revealed an increase in the cases of accelerating aging, blood diseases like anemia and changes in the structure of blood cells, circulatory and lymphatic system syndromes (hemorrhages and high blood pressure which led to frequent heart attacks), genetic changes that determine the insurge of many diseases in people exposed to high radiations levels, and increases in genomic mutations (trisomy of chromosomes 13, 18, 21) in newborns, thyroid malfunctions, immune deficiency, respiratory and nervous system illnesses (epilepsy and neuropsychiatric disorders that impact people’s mental health), congenital malfunction that, together with radiation-induced genetic mutations led to a rise in the number of miscarriages, and many oncological diseases⁶⁰⁹.

However, there is a fundamental aspect that must be underlined: it is impossible to determine the exact impact of radioactive releases on the general population; therefore, as a natural consequence it is also difficult to determine, for these cases, whether it is possible to speak of a violation of the right to life. This is due to the fact that large-scale epidemiological research in the aftermath of an

⁶⁰⁷ Feemster R. (2013). *Study ties cancer on the Wind River Indian Reservation to uranium tailings site*. Available at: <https://www.wyofile.com/study-relates-cancer-on-the-wind-river-indian-reservation-to-uranium-tailings-site/>

⁶⁰⁸ Human Rights Committee (2018). General Comment No.36 (2018 on article 6 of the International Covenant on Civil and Political Rights, on the right to life – CCPR/C/GC/36, para. 7.

⁶⁰⁹ See Yablokov A. V., Nesterenko V. B., Nesterenko A. V. (2010). *Chernobyl: Consequences of the Catastrophe for People and the Environment*. Boston: Blackwell. Regarding predictions about mortality caused by cancers, they report that “[t]he most recent forecast by international agencies predicted there would be between 9,000 and 28,000 fatal cancers between 1986 and 2056”; however, they hold that these figures are an underestimation and more convincing estimations report figures amounting to “212,000 to 245,000 deaths in Europe and 19,000 in the rest of the world”.

accident can reveal an increase in some disease but then looking more closely to the single individuals, it is impossible to establish an undisputed causal link between the insurge of the illness and the radiation exposure (apart from limited cases of very high acute exposure to which, for example, emergency workers were subject for which the correlation disease-radiations is much more probable, though not 100% certain). Indeed, “[r]adiation can induce cancers that are indistinguishable from cancers resulting from other causes”⁶¹⁰, and the same is true for all other illness. This has considerable repercussions on the quest for justice for those people who suffered a violation of the right to life, both in front of national courts⁶¹¹ and regional human rights courts⁶¹² or the Human Rights Committee.

This uncertainty is also reflected in the results of different medical studies on the impact of the Chernobyl and Fukushima accidents on the overall population. As a matter of fact, especially for the Chernobyl disaster, there are thousands of different studies that report very different data and projection; the differences depend of the threshold of radioactivity that they adopt and that they consider high enough to determine a more probable correlation illness-radioactivity doses⁶¹³. To complicate the picture, it is necessary to recall that many of the abovementioned diseases have considerably long latency periods⁶¹⁴ which complicate the assessment of actual violation of the right to life, so that “it will be difficult to determine the exact cause of the deaths”⁶¹⁵, whether natural or radiation exposure-induced.

⁶¹⁰ WTO (2013). *Health risk assessment from the nuclear accident after the 2011 Great East Japan Earthquake and Tsunami based on a preliminary dose estimation*. Available at: <https://www.who.int/publications/i/item/9789241505130>, p. 19.

⁶¹¹ E.g. the Dispute Reconciliation Committee for Nuclear Damage Compensation set up in the aftermath of the Fukushima accident established that some categories of individuals, including those who suffered bodily, damage could ask for compensation “if the nuclear accident is the legally sufficient cause of such damage”. See Osaka E. (2012). ‘Corporate Liability, Government Liability and the Fukushima Nuclear Disaster’, in *Washington International Journal*, Vol. 21, No.3, p. 439-440.

⁶¹² The reference here is basically to the European Court of Human Rights and the Inter-American Court of Human Rights because concerning the African Court on Human and Peoples’ Rights only 6 States still accept the competence of the Court and none of them is a nuclear State (only Tanzania is involved in the extraction of uranium).

⁶¹³ Yablokov A. V., Nesterenko V. B., Nesterenko A. V. (2010). Yablokov A. V., Nesterenko V. B., Nesterenko A. V. (2010) *Chernobyl: Consequences of the Catastrophe for People and the Environment*. Boston: Blackwell, p. 2.

⁶¹⁴ Based on estimates developed from the experience of Hiroshima and Nagasaki, leukemia has a latency period of 5 years at most, thyroid cancers of 10 years, breast and lung cancers generally appear within 20 years from the exposure while stomach and skin neoplastic diseases within 30 years, but latency periods for some diseases can also amount to 50 years,

⁶¹⁵ Yablokov A. V., Nesterenko V. B., Nesterenko A. V. (2010). *Chernobyl: Consequences of the Catastrophe for People and the Environment*. Boston: Blackwell, p. 2, quoting the work of the Chernobyl Forum (2006).

Generally speaking, estimates on the incidence of diseases in the aftermath of the Fukushima accident are much lower⁶¹⁶ than those of Chernobyl because radiation doses stayed below the alert threshold for acute and protracted exposure indicated above; in this sense, providing evidence of violations of the right to life proves even more challenging.

Finally, there is one last important consideration which concerns the extension in time of violations of the right to life stemming from nuclear accidents and activities. As Yablokov, Nesterenko, Nesterenko point out, “the adverse effects in these areas will be apparent for many generations”⁶¹⁷. So violations of the right to life stemming from radiation exposure are particularly severe because they not only involve present generation but they also affect the generations to come. This happens for two reasons: first, because radioactive particles deposited on the soil continue to emit radiations for long periods of time⁶¹⁸, thus keeping polluting the environment and contaminating land products entering in the food chain; second, some of the health consequences related to genetic aberrations and modifications after radiation exposure are transmitted from mother to child or the radioactivity absorbed by mothers can cause the insurgence of diseases in fetuses that, in case they do not lead to miscarriages, will impair the life of the child.

1.1.2. Violations of the Right to Health.

The right to health is primarily and clearly enshrined in Article 12 of the International Covenant on Economic, Social and Cultural Rights and Article 16 of the African Charter, but it is also contained in other international treaties, declarations, States’ domestic constitutions, policies and legislation, and its importance has been underlined in several international conferences⁶¹⁹. As the Committee on Economic, Social and Cultural Rights in the General Comment No.14 on the Right to the Highest Attainable Standard of Health (Article 12) clarifies, the right to health does not have to be conceive narrowly as dealing only with health care, but

⁶¹⁶ See WHO (2013). *Health risk assessment from the nuclear accident after the 2011 Great East Japan Earthquake and Tsunami based on a preliminary dose estimation*. Available at: <https://www.who.int/publications/i/item/9789241505130>.

⁶¹⁷ Yablokov A. V., Nesterenko V. B., Nesterenko A. V. (2010). *Chernobyl: Consequences of the Catastrophe for People and the Environment*. Boston: Blackwell, p. 2.

⁶¹⁸ E.g. Cesium-137, one of the main radionuclides released in the aftermath of the Chernobyl nuclear meltdown, has a half-life of roughly 30 years, where the half-life is time required for a radionuclide to halve its radioactivity levels. See PubChem (n.d.). *Cesium-137*. Available at: <https://pubchem.ncbi.nlm.nih.gov/compound/Cesium-137> (accessed: 23 March 2021)

⁶¹⁹ UNHCR-WTO (2008). *The Right to Health – Fact Sheet No.31*. Geneva: United Nations.

the drafting history and the express wording of article 12.2 acknowledge that the right to health embraces a wide range of socio-economic factors that promote conditions in which people can lead a healthy life, and extends to the underlying determinants of health, such as food and nutrition, housing, access to safe and potable water and adequate sanitation, safe and healthy working conditions, and a healthy environment.

Three of these “underlying determinants of health” are particularly relevant for the present discussion: safe water and food, safe and healthy working conditions and environment. In addition, the analysis of the right to health proposed in the Fact Sheet No.31 of the UNHCR/WTO adds another relevant point: education and information on health-related issues.

The right to health, as it is explained in the aforementioned General Comment and Fact Sheet, implies the granting of freedoms and entitlements. Freedoms refer, *inter alia*, to the right to have control over one’s own health status and bodies, namely every individual should be free to decide about his/her own health condition without external interferences⁶²⁰, while pertinent entitlements include the right to prevention of illnesses, the right to obtain essential treatments and medicines, reproductive health, and the right to receive adequate education and information on health matters⁶²¹. Furthermore, it is necessary to make a distinction between the right to health and the right to be healthy: the right to health does not mean that individuals must be ensured good health; the right to health include a whole set of measures, goods, conditions, programs and facilities that are necessary and contribute to attain “the highest attainable standard of health” each individual can achieve in light of his/her biological, economic and social situation⁶²². In this sense, “States must make every possible effort, within available resources, to realize the right to health and to take steps in that direction without delay”⁶²³, taking also into account and dedicating particular attention to the needs of specific groups (e.g. women, children, elderly people, people with disabilities)⁶²⁴, an

⁶²⁰ Committee on Economic, Social and Cultural Rights (2000). CESCR General Comment No.14: The Right to the Highest Attainable Standard of Health (Art.12).

⁶²¹ UNHCR-WTO (2008). *The Right to Health* – Fact Sheet No.31. Geneva: United Nations.

⁶²² Committee on Economic, Social and Cultural Rights (2000). CESCR General Comment No.14: The Right to the Highest Attainable Standard of Health (Art.12).

⁶²³ UNHCR-WTO (2008). *The Right to Health* – Fact Sheet No.31. Geneva: United Nations, p.5.

⁶²⁴ Even though the need to turn particular attention to these categories of individuals was clearly spelt out by the Committee on Economic, Social and Cultural Rights, *ad hoc* and more specific dispositions are contained in the framework of the Convention on the Elimination of All Forms of Discrimination against Women (Art.12) and the Convention on the Rights of the Child (Art.24).

obligation that was not respected by Japan, as reported by Anand Grover, the UN Special Rapporteur on the right to health, after his visit in 2012 during which he met evacuees⁶²⁵.

Now, it is fundamental to understand what are the essential points in which the right to health is specifically articulated and the specific steps States have to take to guarantee them, in order to understand in what way they can be breached in the event of the nuclear accidents. Regarding the articulation, always focusing on the International Covenant on Economic, Social and Cultural Rights, being the most widely-encompassing and widely-adopted instrument, three paragraphs of Article 12 are extremely relevant. Article 12(2)(a) refers to the steps to be taken “[...] for the reduction of the stillbirth-rate and of infant mortality and for the healthy development of the child”; it is clear that in failing to adequately supervising the activities of TEPCO, adapting safety standards to new seismological evidence and acting promptly and efficiently in the aftermath of the accident, Japanese authorities did not go in the direction of reducing stillbirth-rates, infant mortality and ensuring a healthy development of the child, being potentially adversely affected by the release of radiations arising from an accident that could be avoided or have a much smaller impact, and the protraction of radiation exposure caused by the inefficiency of the disaster management. The same can be said for Soviet authorities.

Article 12(2)(b) mentions “[t]he improvement of all aspects of environmental and industrial hygiene”. According to General Comment No. 14, this paragraph concerns, among other things, the taking of measures of prevention to minimize the likelihood of occupation accidents and illnesses, the supply of safe food and water, and, most importantly, “the prevention and reduction of the population’s exposure to harmful substances such as radiation [...] or other detrimental environmental conditions that directly or indirectly impact upon human health”⁶²⁶. Again, it is clear how in the two cases under examination this obligation was not respected, especially if we consider that in both cases those who suffered the most the consequences of the disaster, in terms of effects on the health conditions, were the NPP employees and emergency workers who, because of the extremely risky tasks they were asked to perform, had to be subject to the maximum care and application of the most stringent preventive and protective measures⁶²⁷. Plus, in relation to the obligation to supply safe food and reduce the exposure to dangerous substance, mention must also

⁶²⁵ Ulrich K. (2017). *Unequal Impact – Women’s and Children’s Human Rights Violations and the Fukushima Daiichi Nuclear Disaster*. Greenpeace Japan, p.22

⁶²⁶ Committee on Economic, Social and Cultural Rights (2000). CESCR General Comment No.14: The Right to the Highest Attainable Standard of Health (Art.12), p. 6, para.15.

⁶²⁷ Further specific details on the working conditions of the emergency workers of both Chernobyl and Fukushima will be given in the next section.

be made to the fact that Japanese government set up campaigns aimed at promoting the eating of products coming from the Fukushima prefecture, in order to contain the impact of the nuclear accident on the economy of the region; the problem was that this food was not adequately tested. Indeed, it was found out that beef containing radioactive particles of cesium was distributed and consumed in eight different Japanese prefectures⁶²⁸

Finally, Article 12(2)(c) makes reference to the “prevention, treatment and control of epidemic, endemic, occupational and other diseases” that, always according to the General Comment, include the initiation of education programs. Now, a particular aspect related to the Japanese management of the nuclear issue that has not been mentioned yet, is that prior the Fukushima disaster, the Ministry of Education, Culture, Sport, Science and Technology distributed a series of textbooks for secondary school students that did nothing but eulogize the safety of NPPs without sensibilizing about the potential risks associated to them⁶²⁹. In addition, after the accident new textbooks were provided to students of all grades; according to the Ministry the purpose was to give information on radiations, but clear reference to the accident and exposure to radiations was made only in the introductions and teachers’ guides that instructed them to minimize on the scale of radiation release⁶³⁰. In this regard, the Committee on Economic, Social and Cultural Rights affirms that “the deliberate withholding or misrepresentation of information vital to health protection or treatment” constitutes a primary violation of the right to health. Anyway, Article 12(2)(c) deals with the prevention of diseases; in this case prevention meant to take all possible measures at disposal to prevent nuclear disasters, something that was not done since due diligence was not applied. Lastly, the Committee admits that “the right to treatment includes [...] provision of disaster relief and humanitarian assistance in emergency situations”⁶³¹.

So, this was the specific content of the right to health as enshrined in the International Covenant on Economic, Social and Cultural Rights; yet, what are the measures or actions States must take in order to guarantee its enjoyment? States have a triple obligation: they have the duty to respect, protect and fulfill human rights. For the right to health, the duty to respect refers to the obligation on the part of the State to avoid any direct or indirect interference with the right to health; a breach of this

⁶²⁸ Ulrich K. (2017). *Unequal Impact – Women’s and Children’s Human Rights Violations and the Fukushima Daiichi Nuclear Disaster*. Greenpeace Japan, p.30.

⁶²⁹ Caldicott E. (2014). *Crisis without end*. New York: The New Press, p.36.

⁶³⁰ Ibid.

⁶³¹ Committee on Economic, Social and Cultural Rights (2000). CESCR General Comment No.14: The Right to the Highest Attainable Standard of Health (Art.12), p. 6, para.16.

obligation is, for instance, the omission of information⁶³², or the pollution of the air, soil and water. In light of this, it is clear that the discharge of radioactive water in the sea authorized by the Japanese government can amount to a violation of the right to health, even though, as noted above, doing nothing could potentially be even more risky. Second, the duty to protect obliges States to take steps, to act in order to prevent third parties from undertaking activities or action that might hinder the enjoyment of the right to health by other people⁶³³, which translates into careful supervision. Among the possible breaches of this obligation General Comment No.14 mentions “the failure to protect consumers [...] from practices detrimental to health”⁶³⁴: it is clear that the lack of clear information on food contamination, and adequate monitoring of radioactivity in foodstuff and water went against this duty. Lastly, the obligation to fulfill refers to the requirement that “States to adopt appropriate legislative, administrative, budgetary, judicial, promotional and other measures to fully realize the right to health”⁶³⁵; in this sense, the field of nuclear energy is strictly linked to the adoption of an appropriate legislative framework, mandated by the Safety Convention and the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, but also to the idea of developing an adequate legislative framework for the promotion of a strong safety culture, that are all aimed at minimizing the likelihood of accidents, and, as a natural consequence, the ensuing adverse effects on the health, but it has been demonstrated how especially in the case of the Fukushima accident this was not done.

Concerning the respect of the rights contained in the Covenant on Economic, Social and Cultural Rights, it is subject to a mechanism of “progressive realization”, enshrined in Article 2, which considers the presence of resource constraints that prevent States Parties to implement the dispositions immediately and fully⁶³⁶. Linking this to the two nuclear disasters that serves us as examples of real-case dynamics and state of affairs, it is possible to affirm that, in the majority of the cases, breaches of the right to health did not stem from a lack of resources to give effect to the right but from a lack of preparedness. In addition, it could be argued that in the case of States with nuclear programs, there shouldn't be room for lack of resources arguments, but the possession of adequate resources for addressing nuclear emergencies should be an obligatory requirement, and to a certain extent this can be derived from provisions in the field of IDRL that require the

⁶³² UNHCR-WTO (2008). *The Right to Health* – Fact Sheet No.31. Geneva: United Nations, p. 25.

⁶³³ *Ibid.*, p.26.

⁶³⁴ Committee on Economic, Social and Cultural Rights (2000). CESCR General Comment No.14: The Right to the Highest Attainable Standard of Health (Art.12), p. 18, para.51.

⁶³⁵ UNHCR-WTO (2008). *The Right to Health* – Fact Sheet No.31. Geneva: United Nations, p.26.

⁶³⁶ *Ibid.*, p.23.

development of emergency plans, and, if interpreted broadly, Article 16 of the nuclear Safety Convention.

1.1.3. The intertwinement between the right to life and the right to health in case of radioactive exposure.

In the introduction to this section, it was stated that, in the context of radioactive releases, there is a close link between the violation of the right to health and the right to life. If we consider all steps and measures that have just been described and that are necessary for the protection, respect and fulfillment the right to health, not only the event of nuclear emergencies but also with respect to extractive activities and management of nuclear wastes, we can easily understand that a failure in their consideration and implementation results in an otherwise avoidable internal or external exposure or *further* exposure to radiations. However, this exposure to radiation can potentially cause the insurgence of diseases that interfere with the right of individuals “to be free from acts and omissions that [...] may be expected to cause their unnatural or premature death, as well as enjoying a life with dignity”⁶³⁷. By way of example, it is useful to mention the case of women in the most contaminated areas at the time of the Chernobyl accident. It should be recalled that women are more sensitive to radiations because of biological/physical reasons. In the aftermath of the disaster which broke out in part because of Soviet authorities’ lack of due diligence, generally speaking, evacuation orders were imposed too late, thus exposing the population to excessive doses of radiations. In addition, adequate instructions were not given on the consumption of contaminated foodstuff and the risks associated to it and stable iodine tablets were not distributed. All these points are clear violation of the right to health. However, these omissions might have caused the insurgence of all the illnesses listed previously that are potentially deadly or disabling, thus leading to a violation of the right to life. In addition, radiation exposure had an impact also on pregnancies, both on those women that were already pregnant at the time of the accident and even those who became pregnant subsequently, violating the right to life of the newborns.

1.2. Other violations of human rights.

⁶³⁷ Human Rights Committee (2018). General Comment No.36 (2018 on article 6 of the International Covenant on Civil and Political Rights, on the right to life – CCPR/C/GC/36, para. 4.

The right to life and the right to health are the most apparent violations of human rights in the aftermath of a nuclear disaster, but unfortunately they are very likely to be accompanied by other fundamental breaches that somehow can be linked to the right to life and the right to health due to the interdependency and indivisibility of human rights. What follows will describe which human rights are very probable to be violated if adequate disaster preparedness and management is lacking, but also structural social and cultural features will be pointed out as variables that contribute to the actual violation. This analysis will always depart from the Chernobyl and Fukushima accidents. Again, the following considerations are not meant to be a sterile investigation of the human rights breaches that occurred in the event of the two disasters, but it aims to show the preconditions and deficiencies that caused them, in order to identify risk factors that can lead to the same violations but in other instances.

1.2.1. Inhuman or degrading treatment.

The phrase degrading treatment refers to “[t]reatment that humiliates or debases an individual, showing a lack of respect for, or diminishing, their human dignity, or when it arouses feelings of fear, anguish or inferiority capable of breaking an individual’s moral and physical resistance”⁶³⁸, and “which in the particular situation is unjustifiable”⁶³⁹. The prohibition to subject someone to inhumane or degrading treatment is enshrined in several Conventions including the International Covenant on Civil and Political Rights (Article 7), ECHR (Article 3), the American Convention on Human Rights (Article 5), the African Charter on Human and Peoples’ Rights (Article 5), the UN Convention against Torture and other Cruel, Inhuman or Degrading Treatment or Punishment. According to the Human Rights Committee General Comment No.20 on Article 7 of the CCPR, the scope of the article has the purpose of protecting not only the physical integrity, but also the dignity and mental integrity of each individual⁶⁴⁰. The assessment of whether a harsh treatment can amount to an inhuman or degrading treatment involves both objective and subjective elements; indeed, it is necessary to take into account the specific features of the single cases which include

⁶³⁸ European Commission (n.d.). *EMN Glossary Search*. Available at: https://ec.europa.eu/home-affairs/what-we-do/networks/european_migration_network/glossary_search/degrading-treatment-or-punishment_en (accessed: 25 April 2021).

⁶³⁹ Reidy A. (2002). ‘The Prohibition of Torture – a guide to the implementation of Article 3 of the European Convention on Human Rights’. Council of Europe- Human rights handbook, No.6, p.16.

⁶⁴⁰ Human Rights Committee (1992). CCPR General Comment No.20: Article 7 (Prohibition of Torture, or Other Cruel, Inhuman or Degrading Treatment or Punishment).

the context in which the ill-treatment took place, its duration, its effects on the victims (both mental and physical) and also some characteristics of the victim like age, sex and health state⁶⁴¹ which are linked with the idea of vulnerability.

Now, it is interesting to apply these theoretical elements to the situation that women had to face after the Fukushima nuclear accident. Ulrich, 2017 points out how acts of violence against women dramatically increased during the emergency, which include rapes in evacuation centers, especially during blackouts, and a surge in domestic violence⁶⁴². Going more in depth into the analysis of women's conditions on evacuation centers, Saito reveals that there was "a consistent failure to consider their needs and priorities, resulting in women feeling frustrated, uncomfortable, and at times, unsafe"⁶⁴³. It is reported that women in evacuation centers were practically subject to exploitation: because of deep-rooted gender roles that characterize the Japanese society, women were expected to cook for the whole center by the centers directors (almost always male) and take care of the injured or ill people, since professional nurses were present only from time to time. This was an additional burden for women that were already traumatized and suffering because of the disaster, so in these conditions they were mentally and physically exhausted, but also frustrated because no compensation was granted to them for their services while men received money if, for instance, they volunteered to collect the rubbish⁶⁴⁴. Moreover, women did not enjoy the minimum privacy to breastfeed their children or change their clothes⁶⁴⁵, and wash and dry their underwear⁶⁴⁶ which was a fundamental factor that contributed to make women feel terribly unsafe and exposed to men's scrutiny. This was due to the fact that the government supplied partitions but their distribution was delayed because it was not judged a priority by local authorities⁶⁴⁷. Even more distressing were the conditions of disabled women: in evacuation centers they faced any kind of barrier and lack of care for their basic needs which forced them to leave⁶⁴⁸. The physical and mental

⁶⁴¹ Reidy Aisling (2002). 'The Prohibition of Torture – a guide to the implementation of Article 3 of the European Convention on Human Rights'. Council of Europe- Human rights handbook, No.6, p. 10.

⁶⁴² Ulrich K. (2017). *Unequal Impact – Women's and Children's Human Rights Violations and the Fukushima Daiichi Nuclear Disaster*. Greenpeace Japan, p.10.

⁶⁴³ Saito F. (2012). 'Women and the 2011 East Japan Disaster', in *Gender & Development*, Vol.20, No.2, p. 268.

⁶⁴⁴ *Ibid.*, p. 269.

⁶⁴⁵ Ulrich K. (2017). *Unequal Impact – Women's and Children's Human Rights Violations and the Fukushima Daiichi Nuclear Disaster*. Greenpeace Japan, p.20.

⁶⁴⁶ Women felt so ashamed and vulnerable that resorted to throw their underwear away instead of washing and drying it publicly. This problem gave rise to admirable projects of solidarity like "the washing network" which was constituted by groups of women who mobilized to collect evacuees underwear, wash and return it to evacuation centers, in order to partially solve the problem. See Saito F. (2012). 'Women and the 2011 East Japan Disaster', in *Gender & Development*, Vol.20, No.2, p.269.

⁶⁴⁷ Saito F. (2012). 'Women and the 2011 East Japan Disaster', in *Gender & Development*, Vol.20, No.2, p. 269

⁶⁴⁸ *Ibid.*, p. 273.

suffering borne by women then led to a statistical increase in the cases of depression, alcoholism and even suicide⁶⁴⁹. The conclusion of a Greenpeace study is that there was a “complete failure on the part of the government to protect the female victims of the Fukushima disaster from gendered violence”⁶⁵⁰ and that “many of the hardships unnecessarily borne by women in the evacuation centers and the violence perpetrated against them in the wake of the disaster resulted from systemic failures in inclusion, prevention, and adequate support”⁶⁵¹.

Nevertheless, the possibility that women were exposed to degrading treatment is not confined to the context of evacuation centers. Indeed, Ulrich describes how women coming from the most contaminated areas were subject to heavy forms of discrimination, denigration and prejudice: they were denied access to some centers, they were asked medical examination results when they applied for jobs, and they were generally isolated⁶⁵². Yet, always according to Ulrich, the most worrying psychological attack refers to the fact that these women were depicted as “damaged goods” in articles and public statements, so that Japanese men were advised not to marry them because they were likely to give birth to deformed children⁶⁵³. This is harmful not only from a sheer psychological point of view, but, because of the structure of the Japanese society, it carries along much deeper and damaging consequences. As a matter of fact

[t]his stigma may be particularly damaging to the social standing and the emotional and psychological health of Fukushima women, given that their role in Japanese society as women is largely defined by traditional gender roles, and therefore tied to the domestic sphere and responsibilities. Being viewed as unable to marry or start a healthy family fundamentally denies these culturally defined characteristics of womanhood to the victims of the disaster⁶⁵⁴.

Therefore, the situations to which women were exposed are not only the result of poor emergency planning and management, but it is also the consequence of the social and cultural organization of the Japanese society that hinder the possibility of women to be economically independent⁶⁵⁵.

⁶⁴⁹ Haworth A. (2013). *After Fukushima: families on the edge of meltdown*. Available at: <https://www.theguardian.com/environment/2013/feb/24/divorce-after-fukushima-nuclear-disaster> (accessed: 26 April 2021).

⁶⁵⁰ Ulrich K. (2017). *Unequal Impact – Women’s and Children’s Human Rights Violations and the Fukushima Daiichi Nuclear Disaster*. Greenpeace Japan, p.20.

⁶⁵¹ *Ibid.*, p.22.

⁶⁵² *Ibid.*, pp.27-28.

⁶⁵³ *Ibid.*

⁶⁵⁴ *Ibid.*, p.28.

⁶⁵⁵ For a punctual analysis of the gender gap that characterizes the Japanese society see Ulrich K. (2017). *Unequal Impact – Women’s and Children’s Human Rights Violations and the Fukushima Daiichi Nuclear Disaster*. Greenpeace

Now, the fundamental question is: can this amount to inhuman or degrading treatment? It is necessary to recall that strong emphasis is devoted to the mental suffering, as well as the physical one, and that an important role is played by the context in which the ill-treatment takes place and the nature of the victim. In light of what has been described above, it seems adequate to label what Fukushima women went through as degrading treatment. In addition, the State can be held responsible for this violation because it did not take appropriate measures “to prevent [...] acts of torture and cruel, inhuman and degrading treatment in any territory under their jurisdiction”⁶⁵⁶, and especially the protection of vulnerable groups such as women. This approach has been confirmed in the jurisprudence of several international human rights courts⁶⁵⁷.

At first sight, it seems that the concept of inhuman or degrading treatment can be applied also to the experience of clean-up workers both in the context of the Chernobyl accident and the Fukushima one. However, this assessment proves more complex and problematic.

As far as Chernobyl is concerned, the so-called liquidators performed extremely dangerous tasks but with very little protection: “[t]he Soviets did not have adequate protective uniforms, so those enlisted to enter highly radioactive areas cobbled together their own shields. Some workers [...] attached aprons made of lead sheets just 2 to 4 millimeters thick over their cotton work clothing”⁶⁵⁸. Accordingly, they were exposed to exceptionally high radiation exposure, thus causing the death of an unclear but considerable number of workers while, always according to rough estimates, 90,000 to 200,000 out of the approximate 600,000 liquidators have to cope with serious health effects. Worth of mention is the work of the so-called “biorobots” that removed the extremely radioactive graphite debris from the roof of the Chernobyl NPP. They were renamed biorobots because initially robots were employed to clean the roof but radiation were so intense that they damaged the electronic components, making machines unusable⁶⁵⁹. For this reason, humans had to carry out the task: “[t]hey would run up to the rooftop for minutes or less, removing just a few shovels of waste

Japan, and Saito F. (2012). ‘Women and the 2011 East Japan Disaster’, in *Gender & Development*, Vol.20, No.2. It is fundamental to note that the perpetuation of such social structure constitute a violation of Article 5 of the Convention on the Elimination of all Forms of Discrimination against Women.

⁶⁵⁶ Human Rights Committee (1992). CCPR General Comment No.20: Article 7 (Prohibition of Torture, or Other Cruel, Inhuman or Degrading Treatment or Punishment).

⁶⁵⁷ E.g. ECtHR *Talpis v. Italy* case, the Italian States was held responsible for the violation of Article 3 of the ECHR because it failed to provide protection to the applicant against violence. See De Vido S. (2017). ‘The ECtHR *Talpis v. Italy* Judgement – Challenging the Osman Test through the Council of Europe Istanbul Convention?’. In *Ricerche Giuridiche* Vol.6, No.2.

⁶⁵⁸ National Geographic (2011). *Pictures: “Liquidators endured Chernobyl 25 Years Ago*. Available at: <https://www.nationalgeographic.com/science/article/chernobyl-25-years-liquidators-pictures> (accessed: 28 April 2021).

⁶⁵⁹ *Ibid.*

before a new crew of liquidators would take their turn. Workers recall feeling pain in their eyes and a lead taste in their mouth due to the high radiation levels". In Addition, Alexievich, in the book "Voices From Chernobyl" includes a monologued by the Deputy Head of the Executive Committee of the Shield of Chernobyl Association Sergei Sobolev, in which he describes the working condition of the liquidators and admits that they slept in tents with straw on the ground, but that straw was collected from the fields in the vicinity of the NPP, so extremely contaminated⁶⁶⁰.

However, the most important passages of the Sobolev's monologue for the present discussion are the following; referring to liquidators' attitude and motivation, he says that

they understand that if it wasn't for them... These are people who came from a certain culture, the culture of the great achievement. They were a sacrifice. [...] They promised them a car, an apartment, a dacha, aid for their families until the end of time. They searched for volunteers. And they found them! [...] They forgot about the cars and apartments they promised -- but that's not why they dove! Not for the material.⁶⁶¹

So, this excerpt suggests an important point: liquidators somehow chose to work at the Chernobyl NPP out of a sentiment of loyalty and a sense of duty towards their country and their fellow citizens. It was the same spirit that motivated young boys to go to war and fight for their country and in a sense this was a war as well: a war against time and an invisible enemy that was anyway able to bring death and suffering.

Also considering the aforementioned definition of inhuman or degrading treatment, it seems that it does not suit the condition of liquidators: a degrading treatment deals with a diminishment of the human dignity, fear, sense of inferiority. It is not just a physical suffering but it also implies a deep psychological component that, as far as it is possible to grasp, was not present in the Chernobyl liquidators. Of course, discussions could be held on whether there was some form of coercion behind their apparently free choice and whether they were aware of the risks they were coming up against, but the carryout of a more punctual assessment is hindered by the fact that the Soviet Union undertook a "massive cover-up operation and a calculated policy of disinformation"⁶⁶².

Different from that of Chernobyl liquidators seems the situation of some of the Fukushima clean-up workers, though the difference in the conclusion might be the result of information biases. Their

⁶⁶⁰ Alexievich A. (2006). *Voices from Chernobyl. Reprint translated edition*. New York: Picador.

⁶⁶¹ Ibid.

⁶⁶² Yaroshinskaya A. (2013). *Secret Chernobyl Documents Expose the Cover-up*. Available at: <https://www.dianuke.org/secret-chernobyl-documents-expose-the-cover-up/> (accessed: 28 April 2021).

situation caught the attention of the United Nations Human Rights Office of the High Commissioner. In 2018, the Special Rapporteur on the implications for human rights of the environmentally sound management and disposal of hazardous substances and wastes, the Special Rapporteur on contemporary forms of slavery, including its causes and consequences, and the Special Rapporteur on the right of everyone to the enjoyment of the highest attainable standard of physical and mental health⁶⁶³, delivered some worrying statements:

[w]orkers hired to decontaminate Fukushima reportedly include migrant workers, asylum seekers and people who are homeless. [...] We are deeply concerned about possible exploitation by deception regarding the risks of exposure to radiation, possible coercion into accepting hazardous working conditions because of economic hardships, and the adequacy of training and protective measures. We are equally concerned about the impact that exposure to radiation may have on their physical and mental health. [...] They are often exposed to a myriad of human rights abuses, forced to make the abhorrent choice between their health and income⁶⁶⁴.

Reading this, it appears that the condition of some Fukushima clean-up workers amounts to a degrading treatment: they are subject to both physical and mental suffering, but, most importantly, the last sentence of the quotation conveys the idea of diminishment of human dignity, of inferiority and anguish. Here there is not a free choice dictated by the desire to serve one's country with pride, but a forced choice dictated by economic needs. In this regard, there is an important point, remarked by Reidy, who notices that, according to the ECtHR, "it may well suffice that the victim is humiliated in his own eyes, even if not in the eyes of others"⁶⁶⁵. This adds importance to the psychological condition that is the main element that seems to be lacking in the Chernobyl case. Moreover, the fact that the Special Rapporteur on contemporary forms of slavery contributed to the delivery of those statement is noteworthy.

To conclude, if the analysis on the presence of a violation of the right not to be subject to inhuman or degrading treatment is debatable, it is instead hard to contradict the fact that, both in the case of the Chernobyl liquidators and Fukushima clean-up workers, there was a breach on the part of the State of Article 7 of the ICESCR on the "enjoyment of just and favorable conditions of work", which,

⁶⁶³ UNHRHC. (2018). *Japan: Fukushima clean-up workers, including homeless, at grave risk of exploitation, say UN experts*. Available at: <https://www.ohchr.org/en/NewsEvents/Pages/DisplayNews.aspx?NewsID=23458&LangID=E> (accessed: 28 April 2021).

⁶⁶⁴ Ibid.

⁶⁶⁵ Reidy A. (2002). 'The prohibition of torture – a guide to the interpretation of Article 3 of the European Convention on Human Rights', in *Human rights handbook*, No.6.

in turn, is strictly linked to a violation of the right to the highest attainable standard of physical and mental health (Article 12 ICESCR), as well as the right to life, and the right to an adequate standard of living (Article 11 ICESCR).

1.2.2. Violations of human rights related to housing and the protection of the family.

Housing is one of the most pressing and delicate issues in the aftermath of a disaster also because of its link with the stability and serenity of family life. The human right to adequate housing is oftentimes considered as part of the right to an adequate standard of living but, over the years, it has acquired increasing attention as a self-standing human right. As a matter of fact, taking the example of the ICESCR, it is contained in Article 11 as part of the right to an adequate standard of living, but the Committee on Economic, Social and Cultural rights adopted several General Comments specifically aimed at addressing issues related to the right to adequate housing⁶⁶⁶. Of course, the right to housing is contained also in a wide number of other international and regional human right instruments; in addition, in the case of regional instruments in which it is not explicitly mentioned, its protection was inferred from the protection of other human rights⁶⁶⁷.

The UNHCR, reporting the content of the Committee on Economic, Social and Cultural Rights General Comment No.4, states that “the right to adequate housing should not be interpreted narrowly. Rather, it should be seen as the right to live somewhere in security, peace and dignity”⁶⁶⁸. Furthermore, always following the analysis of UNHCR, the right to adequate housing brings along the fundamental requirements of habitability, which is linked to physical safety, and location that refers to the fact that housing is not adequate if it does not permit easy access to primary services (e.g. schools, hospitals), and if it is situated in dangerous territories⁶⁶⁹. It stands to reason that territories contaminated by radioactive fallout do not respect these requirements. In addition, States are compelled to “make every possible effort, within their available resources, to realize the right to adequate housing and to take steps in that direction without delay”⁶⁷⁰.

The right to adequate housing comprise also the idea of protection from forced evictions, as pointed out by the CESCR General Comment No.4, where “[f]orced evictions can be broadly defined as the

⁶⁶⁶ E.g. General Comment No. 4 on the right to adequate housing, No. 7 on forced evictions, and No. 16 on, in part, the right to respect home.

⁶⁶⁷ See UNHCR (2009). *The Right to adequate housing – Fact Sheet No.21 (Rev.1)*. Geneva: United Nations.

⁶⁶⁸ UNHCR (2009). *The Right to Adequate Housing, Fact Sheet No. 21 (Rev.1)*. Geneva: United Nations.

⁶⁶⁹ *Ibid.*, p. 4.

⁶⁷⁰ *Ibid.*, p.5.

permanent or temporary removal against their will of individuals, families and/or communities from the homes and/or land which they occupy, without the provision of, and access to, appropriate forms of legal or other protection”⁶⁷¹. In this sense, Committee on Economic, Social and Cultural Rights General Comment No.7 specifies that forced evictions can only take place in very exceptional occasions and in conformity with human rights provisions. The fact that the right to adequate housing implies the freedom from forced evictions, reinforces the idea of the fundamental link with the freedom to choose one’s own residence. These elements are necessary in order to judge whether, especially in the case of the Fukushima accident, the evacuation of people from the most affected areas led also to violations of the right to adequate housing, which is of course deeply affected in the case of disasters.

In the aftermath of the Chernobyl accident about 200,000 people were evacuated⁶⁷², while the number in the case of the Fukushima accident is even higher, amounting to a maximum of 550,000 individuals⁶⁷³. Of course, both situation fall in the set of limited occasions in which forced eviction is permitted: in order to guarantee the protection of individuals’ health, people were forced to abandon their houses and were first relocated in evacuation centers. Once they were evacuated, they acquired the status of internally displaced persons (IDPs), defined as “persons or groups of persons who have been forced or obliged to flee or to leave their homes or places of habitual residence, in particular as a result of or in order to avoid the effects of armed conflict, situations of generalized violence, violations of human rights or natural or human-made disasters, and who have not crossed an internationally recognized state border”⁶⁷⁴ by the non-binding though very authoritative Guiding Principles on Internal Displacement. Now, IDPs obviously still enjoy their human right to adequate housing which translates into the fact that they must be provided with adequate shelter, where the requirement of adequacy refers to the presence of appropriate space, privacy and security⁶⁷⁵. In light of the analysis carried out in previous section on the conditions of women in evacuation centers and the well-documented lack of sufficient nutritious food, water,

⁶⁷¹ UNHCR (n.d.). *Forced evictions*. Available at: <https://www.ohchr.org/en/issues/housing/pages/forcedevictions.aspx> (accessed: 29 April 2021).

⁶⁷² Gray R. (2019). *The true toll of the Chernobyl disaster*. Available at: <https://www.bbc.com/future/article/20190725-will-we-ever-know-chernobyls-true-death-toll> (accessed: 1 May 2021).

⁶⁷³ Ishimori M. (2017). *Right to housing after Fukushima Nuclear disaster: through a lens of international human rights perspective*. Available at: https://disasterlaw.ifrc.org/media/1734?language_content_entity=en (accessed: 2 May 2021).

⁶⁷⁴ UN-OCHA (2001). *Guiding Principles on Internal Displacement*. Geneva: United Nations.

⁶⁷⁵ Ishimori M. (2017). *Right to housing after Fukushima Nuclear disaster: through a lens of international human rights perspective*, p. 6 Available at: https://disasterlaw.ifrc.org/media/1734?language_content_entity=en (accessed: 2 May 2021).

medical care and poor hygienic conditions due to the frequently-mentioned unpreparedness to manage such a massive emergency⁶⁷⁶, it can be easily claimed that Japan failed to guarantee the enjoyment of the right to adequate housing. Yet, the most important consequence of this failure is its impact on the paramount right to life. Indeed, Ishimori points out how some “disaster-related deaths were indirect results of physical and mental exhaustion caused by harsh conditions at shelter or during displacement, and worsening of pre-existing illnesses due to inaccessibility to health care”⁶⁷⁷. This is also a confirmation of the thesis of the violation of the right not to be subject to inhuman or degrading treatment.

There is another important issue related to the right of adequate housing in the context of the Fukushima disaster that attracted the attention of the international community and that is worth being discussed. Right after the accident, the Japanese government undertook a massive program of decontamination of the areas poisoned by radioactive particle, in order to allow IDPs to get possession of their houses and properties back. The lifting of evacuation order started in 2014 for those areas which were less contaminated⁶⁷⁸, and continued over the subsequent years. However, together with evacuation orders, also the monetary compensation provided to evacuees by the Act on Compensation for Nuclear Damage⁶⁷⁹ were lifted.

In order to understand why this move concerned the international community, a set of elements have to be recalled. First, no radiation exposure is free from risks and it is subject to linear accumulation, so that the more considerable and protracted the exposure, the higher the risks for the health, especially for women and children. Second, though strictly linked to the previous point, after the accident, the Japanese government took the decision to increase by twenty times, from 1 mSv/year to 20 mSv/year, the threshold of radiation exposure it considered acceptable. Third, it should be recalled that the right to adequate housing that States are obliged to respect, protect and fulfill includes the concepts of location and habitability described above. Now, Burnie reports what follows:

[i]n terms of effectiveness, radiation levels in these decontaminated zones have been reduced in many areas but there are also multiple examples where levels remain significantly above the governments long range target levels. In addition to where decontamination has been only

⁶⁷⁶ Ibid., p. 5.

⁶⁷⁷ Ibid., p. 5.

⁶⁷⁸ Ibid., p. 3.

⁶⁷⁹ Osaka E. (2012). ‘Corporate Liability, Government Liability and the Fukushima Nuclear Disaster’, in *Washington International Journal*, Vol. 21, No.3, p. 434.

partially effective, the principle problem [...] is that the decontamination has created islands where levels have been reduced, but which are surrounded by land, and in particular, forested mountains, for which there is no possible decontamination. [...] As a consequence, areas decontaminated are subject to recontamination through weathering processes and the natural water and lifecycle of trees and rivers⁶⁸⁰.

Therefore, not only are decontaminated territories considered unsafe according to the higher threshold for radiation exposure, but there are also areas that are still considerably dangerous, so that the requirements of habitability and location, that are fundamental elements of the right to adequate housing are not present. In this situation, the concerns of evacuees for possible repercussions on health were legitimate. Furthermore, the fact that compensation was suspended with evacuation orders forced people to return in the alleged decontaminated areas despite their fears, since they could not afford to find an alternative accommodation, thus going against people's freedom to choose their own residence, that, according to the content of General Comment No. 27 on Article 12 of the ICCPR, shall not be subject to public interferences.

Always in relation to the issue of housing after the Fukushima disaster and the lifting of evacuation orders, Principle 28(2) of the Guiding Principles on Internal Displacement provides that affected people shall be involved in decision-making with respect to the "planning and management of their return or resettlement". Ishimori citing the United Nations' Inter-Agency Standing Committee's Framework on Durable Solutions for Internally Displaced Persons, affirms that "coercion in tacit forms, such as [...] setting arbitrary time limits to end assistance before the minimum conditions conducive for returns, or resettlement [are present]"⁶⁸¹ goes against Principle 28(2); therefore, the Japanese government decision, that can amount to coercion since evacuees are forced to return to their houses due to economic constraints caused by the suspension of compensation, is in conflict with Principle 28(2) and the people's right to be involved in decision-making (issues related to the right of information and involvement in decision-making will be the specific subject of the following section), because it did not take evacuees concerns into consideration.

⁶⁸⁰ Burnie S. (2017). *The Fukushima nuclear waste crisis in a human rights violation*. Available at: <https://www.greenpeace.org/international/story/11710/the-fukushima-nuclear-waste-crisis-is-a-human-rights-violation/> (accessed: 3 May 2021).

⁶⁸¹ Ishimori M. (2017). *Right to housing after Fukushima Nuclear disaster: through a lens of international human rights perspective*. Available at: https://disasterlaw.ifrc.org/media/1734?language_content_entity=en. p.4 (accessed: 2 May 2021) .

Furthermore, the Japanese Government decision constitutes a breach of the right to health and right to life because of the health risks associated with returning to only partially decontaminated zones, and more directly of the freedom to choose one's own residence, as already noted above, and of the right to the respect of private life; indeed, the suspension of compensation can be considered as an *arbitrary* interference with one's private and family life since the government did not involve affected people decision-making and the decision to lift evacuation orders heavily constrained people's freedom of choice on familial matters. Moreover, to a certain extent, this can be considered as a forced eviction, according to the aforementioned definition, from which individuals have to be protected by States. This suggest that in name of the creation of the myth of recovery⁶⁸², based on the idea of efficiency and rapidity of recovery, a human rights-based approach stressed in the Sendai Framework and the ILC Draft Article on the Protection of Persons in the Event of Disasters was left behind⁶⁸³, causing physical but also psychological suffering since people "were faced with the dilemma of either putting the health and well-being of their families at risk or giving up compensation benefit"⁶⁸⁴. Ulrich considers it "a deliberate, structural violence against the victims of the Fukushima disaster"⁶⁸⁵.

As well as a breach of the right to adequate housing due to the non-respect of the requirement of habitability and location, it can also be argued that the hard or often forced decision to which parents were subject is a violation of Article 17 of the ICCPR, as already hinted at, which, *inter alia*, provides that "no one shall be subject to arbitrary or unlawful interference with his privacy [...]", and Article 10 of the ICESCR, stating that "[t]he States Parties to the present Covenant recognize that: (1) the widest possible protection [emphasis added] should be accorded to the family [...]". The content of 10 of the ICESCR is important also in light of the deep-rooted social disparities characterizing the Japanese society and traditional ideas on gender roles: men are traditionally raised to be pragmatic, to acquire a risk-taking attitude to show their masculinity, to be focused on work and the economic management of the family; this means that many of them obviously favored the return in the "decontaminated" areas, putting economic concerns before health ones. This

⁶⁸² Burnie S. (2017). *The Fukushima nuclear waste crisis in a human rights violation*. Available at: <https://www.greenpeace.org/international/story/11710/the-fukushima-nuclear-waste-crisis-is-a-human-rights-violation/> (accessed: 3 May 2021)

⁶⁸³ The lack of a human-centered approach was stresses also by the Committee on Economic, Social and Cultural Rights (2013) in its concluding observations on the third periodic report of Japan, adopted by the Committee at its fiftieth session (29 April-17 May 2013), para 24.

⁶⁸⁴ Khan K. J. (2018). 'Post-Disaster Policy Decision-Making and the Prospects of Human Rights – The Case of Fukushima Daiichi Nuclear Power Plant Accident', in *Sociology and Anthropology*, Vol.6, No.1, p.124.

⁶⁸⁵ Ulrich K. (2017). *Unequal Impact – Women's and Children's Human Rights Violations and the Fukushima Daiichi Nuclear Disaster*. Greenpeace Japan, p.11.

inevitably created tensions within families, since women put the protection of children in the first place, exacerbating the phenomenon of “atomic divorce”⁶⁸⁶. In this sense, because of the tensions created by an *arbitrary* order of the government, the family was not protected at all.

Furthermore, the fully-fledged coercion to which evacuees were subject because of governmental decisions, violates a few Articles of the Convention on the Rights of the Child⁶⁸⁷ which recognize the right of parents to decide without interference what is better for their children. In addition, to the extent that in decontaminated areas several fundamental educational, medical, business, and recreational services are not present or fully operative, the forced relocation clashes with the right to adequate housing requirement of location, as well as Article 28 on the right to education and Article 31 on the right to play of the Convention on the Rights of the Child⁶⁸⁸.

As a conclusive remark, it is relevant to note that, in 2017, some evacuees took also part in hearings, in Geneva, in front of the experts of the Human Rights Committee for the alleged violations of their human rights in relation to the lifting of evacuation orders⁶⁸⁹, so the issues of housing, in relation to the consequences of the Fukushima disaster, was under the lenses of the whole international community. The Committee kept following the case and the following year issued a statement in which it urged Japan to stop forcing the return of women and children in those areas in which radioactivity surpasses the threshold deemed safe before the accident, so before it was raised to 20 mSv/year⁶⁹⁰. Therefore, it also reiterated the dangerous repercussions this measure of relocation can have on the health, especially of women and children, recalling that part of the responsibility to ensure the highest attainable standard of health “requires State parties such as Japan to prevent and minimise avoidable exposure to radiation and other hazardous substances”⁶⁹¹.

1.2.3. *The right to information and involvement in decision-making.*

Throughout the previous sections, it has repeatedly been shown how both Soviet authorities and

⁶⁸⁶ Ibid.

⁶⁸⁷ E.g. Articles 3(2), 5, 18, 27(2)

⁶⁸⁸ Khan K. J. (2018). ‘Post-Disaster Policy Decision-Making and the Prospects of Human Rights – The Case of Fukushima Daiichi Nuclear Power Plant Accident’, in *Sociology and Anthropology*, Vol.6, No.1, pp. 116-134.

⁶⁸⁹ McCurry J. (2017). *Fukushima evacuee to tell UN that Japan violated human rights*. Available at: <https://www.theguardian.com/environment/2017/oct/11/fukushima-evacuee-un-japan-human-rights> (accessed: 3 May 2021).

⁶⁹⁰ UNHCR (2018). *Japan must halt returns to Fukushima, radiation remains a concern, says UN rights experts*. Available at: <https://www.ohchr.org/en/NewsEvents/Pages/DisplayNews.aspx?NewsID=23772&LangID=E> (accessed: 5 May 2021).

⁶⁹¹ Ibid.

Japanese ones⁶⁹² failed to provide the affected populations with clear and adequate information, or even engaged in campaigns of disinformation as in the already-mentioned case of Japanese school materials, a failure that fundamentally impacted people's right to health and life. In addition, the mounting skepticism of the population in the context of both accidents, as a consequence of the perception that not the entire truth was being communicated, undermined the confidence in the authorities that were charged with managing the recovery, thus creating even more confusion and critical situation⁶⁹³. Indeed, the lack of information about radioactivity in the aftermath of an accident, and, more broadly, the scant information provided on nuclear and radiation-related issue led to the so-called radiophobia⁶⁹⁴ that can give rise to counterproductive agitations.

The right to information is contained, at the international level, in Article 19(2) of the ICCPR, and Article 13 of the Convention on the Rights of the Child, as part of the right to freedom of expression. A very valuable analysis of the content and extent of the right to information was carried out by the non-governmental organization "ARTICLE 19", whose work was also reported and eulogized by the Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression, Mr. Abid Hussain, in his 2000 report. The organization ARTICLE 19 claims that "[a]ccess to information laws reflect the fundamental premise that government is supposed to serve the people"⁶⁹⁵, and, it could be added, to protect, respect and fulfill human rights. The same non-governmental organization developed, back in 1999, the "Principles on Right to Information Legislation", which were later updated in 2015. The first two principles are of extreme importance for the present discussion. Principle 1 provides that "[r]ight to information legislation should be guided by the principle of maximum disclosure"⁶⁹⁶, while, and most importantly, Principle 2 states that "[p]ublic bodies should be under an obligation to publish key information"⁶⁹⁷; it means that not only must authorities deliver information upon request, but they must also willingly disseminate

⁶⁹² In this regard, two years after the Fukushima accident, the Committee on Economic, Social and Cultural Rights reiterated "its concern about the lack of transparency and disclosure of necessary information regarding the safety of nuclear power installations". See Committee on Economic, Social and Cultural Rights (2013). Concluding observations on the 3rd periodic report of Japan, adopted by the Committee at its 50th session, 29 April-17 May 2013 : Committee on Economic, Social and Cultural Rights, E/C.12/JPN/CO/3, para.25.

⁶⁹³ Hecla J., Levikow G., Pirnavskaia K. (2020). *Minimizing the consequences of nuclear accidents through effective communication*. Available at: <https://thebulletin.org/2020/08/minimizing-the-consequences-of-nuclear-accidents-through-effective-communication/> (accessed: 6 May 2021).

⁶⁹⁴ Ulrich K. (2017). *Unequal Impact – Women's and Children's Human Rights Violations and the Fukushima Daiichi Nuclear Disaster*. Greenpeace Japan, p. 18.

⁶⁹⁵ Article 19. (2012). *International Standards: Right to information*. Available at: <https://www.article19.org/resources/international-standards-right-information/> (accessed: 8 May 2021).

⁶⁹⁶ Article 19. (2015). *The Public's Right to Know – Principles on Right to Information Legislation*. Available at: https://www.article19.org/data/files/RTI_Principles_Updated_EN.pdf (accessed: 8 may 2021).

⁶⁹⁷ Ibid.

information “of significant public interest”⁶⁹⁸. In this context, the Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression urged states to update or adopt legislation to guarantee that the previous principles are applied and respected. In addition, ARTICLE 19 points out that the access to information, intended as the obtention of necessary information and/or their public dissemination, is fundamental also for the fulfillment of important social purposes: it is instrumental for the respect of human dignity, and personal decision-making⁶⁹⁹. Considering this last point in the context of nuclear accident, it is clear how the failure to provide adequate and understandable information on the unfolding of events and radioactivity levels prevent people from taking thoughtful decisions that can have a huge impact on their health and life. To make a striking example, due of the lack of a clear understanding of the effect of radiations, especially on children, some high school students were given the authorization to have a school trip at the destroyed Fukushima facility to witness the extent of the disaster, or middle and high school students were involved in clean-up operation in the context of the activities of beautification groups⁷⁰⁰; though they were not allowed to enter the most contaminated areas, they did not have any special protection to shield them from radiations.

As well as for personal decision-making, the failure to provide or disclose relevant information is an obstacle for the right of individuals to actively and effectively take part in decision-making processes whose results are likely to affect their lives. ARTICLE 19 asserts that “[t]he public has a right to scrutinize the actions of its leaders and to engage in full and open debate about those actions. It must be able to assess the performance of the government and this depends on access to information about [...] matters of public concern”⁷⁰¹. If individuals are not given the relevant information, it is unlikely that they have the means to constructively participate in decision-making and judge the positiveness or appropriateness of governmental actions.

Moreover, as hinted above, the lack of adequate communication to the public can cause a decrease in the degree of confidence towards State authorities. In addition, the skepticism that arise from the information vacuum is exacerbated by the suspicion caused by the very fact that a nuclear accident occurred despite the reassurances about the absolute safety of nuclear facilities. So, the public wonders why they have to follow State’s instructions and believe what is told them when,

⁶⁹⁸ Ibid.

⁶⁹⁹ Ibid.

⁷⁰⁰ Ulrich K. (2017). *Unequal Impact – Women’s and Children’s Human Rights Violations and the Fukushima Daiichi Nuclear Disaster*. Greenpeace Japan, p. 41.

⁷⁰¹ Article 19. (2012). *International Standards: Right to information*. Available at: <https://www.article19.org/resources/international-standards-right-information/> (accessed: 8 May 2021).

first, what they were told about the safety of NPPs was wrong and they are not provided with information to even minimally judge the truthfulness of public statements and the adequacy of measures⁷⁰².

The right to participate in decision-making is enshrined, at the international level, in Article 25 of the ICCPR. This right was breached by both the Soviet and Japanese State. It must be noted that participation in decision-making is fundamental not only in the post-disaster reconstruction phase in order to address punctually people's needs, but also in emergency planning and preparedness. Indeed, if the population is involved, people can develop the necessary awareness and mechanisms of protection that can be vital in case the disaster materializes. In brief, if they are involved in decision-making, first, they can help in devising emergency plans that take into account local specificities and second, they become more familiar with procedures and necessary steps that have to be taken when an emergency breaks out, thus making the response much more effective and organized⁷⁰³. Starting from what has been described in the previous sections about the early post-disaster phases, it is evident that such approach was not adopted by Soviet and Japanese authorities.

Of course, stakeholders involvement is fundamentally necessary also in the reconstruction phase. As far as the Chernobyl experience is concerned, NEA reports that the failure to involve local population in order to have a feedback on the real needs caused a situation in which

[r]esponding to this situation from the centre with ever more elaborate schemes often served merely to exacerbate the situation insofar as such responses still failed to grasp the complexity and diversity of the problems on the ground. The result instead was often incoherence and inconsistency. Thus, increasingly complex social assistance schemes ended up in some cases providing more money for people in less-contaminated areas than for those in more contaminated ones. In other cases, people were effectively incentivised to increase their exposure. Similarly, the delivery of healthcare was sub-optimal where it was based on ill-defined risk rather than appropriately measured need⁷⁰⁴.

The switch to an approach based on population involvement in decision-making unfortunately came several years after the accident and was driven by the intervention of international organizations

⁷⁰² NEA. (2006). *Stakeholders and Radiological Protection: Lessons from Chernobyl 20 Years After*. Paris: OECD PUBLICATIONS, p. 30.

⁷⁰³ *Ibid.*, p.31.

⁷⁰⁴ *Ibid.*, p.32.

and institutions; worth of mention is the work of the Inter-Agency Task Force on Chernobyl, under the direction of the United Nation Development Programme⁷⁰⁵. In this way, affected people felt part of the recovery project and “that they had control over their lives and that they were able to contribute to the achievement of an adequate level of protection in the context of the radioactive contamination they confronted”⁷⁰⁶. This change in approach was also instrumental in order to restore solid confidence in public authorities that is essential to progress smoothly towards full recovery.

Regarding the Fukushima experience, it is possible to carry out a more detailed analysis of the failure on the part of State authorities to respect the obligations set out in Article 25 of the ICCPR, due to the presence of more accurate records, accounts and reports of the actual situation and especially of disaggregated reports that allows to focus on the most vulnerable groups. In light of what has been said about the situation of women in the post-disaster phase, it is useful to consider how their life conditions were worsened by a lack of involvement in decision-making. Here, the issue of traditional gender roles and gender prejudices play again a fundamental role. In Japan, the great majority of decision-makers at all levels (i.e. national, regional and local) are men; in the words of Ulrich, this gender imbalance hindered “women’s ability to express and act on their concerns, much less see them reflected in policy”⁷⁰⁷, so that “women had, and continue to have, little opportunity to contribute to the systems that impact their lives or to enact preventative measures and safe community systems”⁷⁰⁸. Therefore, problems arose both in context of emergency planning and preparedness, and in the post-disaster phase. Regarding the post-disaster phase, the failure to pay attention to gender-related issue, because of cultural biases which lead to an underestimation of women’s needs and lack of affective involvement of women in decision-making and planning, caused a situation for which “over 80 per cent of local authorities did not include special measures for women and vulnerable people such as ‘setting up a day-care centre’, ‘safety measures for preventing violence against women and sexual harassment’, and ‘support for families caring for ill people, people with disabilities, and elderly people’ in their administration manuals for evacuation centres”⁷⁰⁹. As well as being a violation of human rights *per se*, the non-involvement of women in

⁷⁰⁵ See UNGA (2019). Persistent legacy of the Chernobyl Disaster – Report of the Secretary-General, A/74/461.

⁷⁰⁶ NEA. (2006). *Stakeholders and Radiological Protection: Lessons from Chernobyl 20 Years After*. Paris: OECD PUBLICATIONS, p.36.

⁷⁰⁷ Ulrich K. (2017). *Unequal Impact – Women’s and Children’s Human Rights Violations and the Fukushima Daiichi Nuclear Disaster*. Greenpeace Japan, p. 18.

⁷⁰⁸ *Ibid.*, p.22.

⁷⁰⁹ Saito F. (2012). ‘Women and the 2011 East Japan Disaster’, in *Gender & Development*, Vol.20, No.2, p.268.

decision-making and emergency planning triggered a chain reaction of human rights violations, including, putting together what has just been said with the previous analysis of the situation of women in evacuation centers, the right not to be subject to inhuman or degrading treatment. Unfortunately, it seems that the lesson has not been learnt and the exclusion of women persisted even in the recovery phase; a telling number is that, within the Reconstruction Design Council set up by the Government in order to manage the rehabilitation phase, members were fourteen men and just one single woman.

So, as just noted, the violation of the right to participate in decision-making has led to the subsequent violation of other human rights. Particularly important is the connection between public involvement and the right to health. This link was also stressed by the UN Special Rapporteur to the Human Rights Council, Anand Grover, in the Report of the Special Rapporteur on the right of everyone to the enjoyment of the highest attainable standard of physical and mental health, submitted after his mission to Japan in 2012; from it, it is possible to read that “[p]articipation of the population at all stages of decision-making processes at national and community levels is a critical feature of the right to health framework. Health-related laws and policies should be instituted only with direct, active and effective involvement of communities, since they are most impacted by these decisions [...]”⁷¹⁰. In this sense, the non-involvement of people in the device of emergency plans (that implies the fact that people do not know how to personally behave and respond in case of accidents), but also in the case of the establishment of the policies for the return to decontaminated areas can cause additional unnecessary exposure to radiations. In addition, together with the lack of provision of relevant information, exclusion from decision-making can lead to a deterioration of mental health because people feel increasingly stressed, frustrated and helpless when they do not have the means to decide willingly about them, but also about other individuals for whom they are responsible, and what is better to do or not to do, or when someone else decides for them with very limited possibility to change or oppose that given decision, as it happened in the case of the lifting of evacuation orders. All these examples fit the expression “health-related policies” mentioned by the UN Special Rapporteur to the Human Rights Council Anand Grover, because policies related to evacuation schemes and other emergency plans, return to affected areas, or the aforementioned policies related to the management of evacuation centers, all have a direct or indirect impact on both the physical and mental health of the affected people.

⁷¹⁰ Human Rights Council (2012). Report of the Special Rapporteur on the right of everyone to the enjoyment of the highest attainable standard of physical and mental health, Anand Grover, (A/HCR/23/41/Add.3), para.73.

In this context, mention must also be made to the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention), which in Article 1 states that “[i]n order to contribute to the protection of the right of every person of present and future generations to live in an environment adequate to his or her health and well-being, each Party shall guarantee the rights of access to information, public participation in decision-making, and access to justice in environmental matters in accordance with the provisions of this Convention”⁷¹¹. Though it is a regional instrument, it essentially reiterates the importance of the human right to information and involvement in decisions making in the context of environmental issues (nuclear accidents have a very strong link with environmental issues, so the scope of the convention is relevant here) that is essential *per se*, but most importantly because it contributes to the full enjoyment and realization of other fundamental human rights⁷¹².

2. Human Rights and the environment.

It has already been hinted at the importance of the environmental factor in the event of radioactive release, to the extent that environmental contamination has a direct consequence on the levels of individuals’ radioactivity exposure, both internal and external. However, it is worth delving more into the impact of radiation on the natural environment.

Many studies in the aftermath of the Chernobyl nuclear accident tried to move beyond a mere anthropocentric approach to the analysis of the environmental impact of radiations - an approach centered on the investigation of consequences on the environment with the aim of assessing the correlation with human exposure and, thus, devising strategies to minimize it - with a more eco-centric research⁷¹³. In the following pages, both perspectives will be taken into account.

Radiative contamination affects all elements of what we consider to be the environment: the atmosphere, the soil, and water resources⁷¹⁴, thus impacting the lives of all living organisms that inhabit them. Radionuclides, ones released in the air, are transported by the wind and deposited on

⁷¹¹ Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention), Article 1.

⁷¹² UNECE (n.d.). *Aarhus Convention – Introduction*. Available at: <https://unece.org/environment-policy/public-participation/aarhus-convention/introduction> (accessed: 10 May 2021).

⁷¹³ Otaki J. M. (2016). ‘Fukushima’s lessons from the Blue Butterfly: A Risk Assessment of the Human Living Environment in the Post-Fukushima Era’, in *Integrated Environmental Assessment and Management*, Vol.12, No.4, p. 668.

⁷¹⁴ Yablokov A. V., Nesterenko V. B., Nesterenko A. V. (2010). *Chernobyl: Consequences of the Catastrophe for People and the Environment*. Boston: Blackwell, p.221.

every surface, helped also by rainfalls. However, once radioactive particles have been deposited, they can re-contaminate the atmosphere due to agricultural work that shakes the soil on which radionuclides had been deposited and in which they had penetrated, and re-free them⁷¹⁵. The same happens in periods of droughts when the soil is more dusty, so that radioactive dust is more easily raised and transported by the wind⁷¹⁶. In order to understand the importance of these natural dynamics, it suffices to mention what Yablokov, Nesterenko and Nesterenko reported: “[o]n September 6, 1992, radioactive aerosols lifted by a strong wind from the 30-km Chernobyl zone reached the vicinity of Vilnius, Lithuania (about 300 km away)”⁷¹⁷. Of course this continuous circulation of radioactive particles keeps increasing both the internal and external exposure to radiations of human beings and animals, but also the contamination of plants because radionuclides are repeatedly re-deposited on their surface and absorbed by roots (as time passes radionuclides penetrate in the deeper soil layers where they are taken in by plants roots; this is called vertical migration⁷¹⁸). The re-contamination of the atmosphere is also exacerbated by woods fires: when contaminated trees burn, of course they release radioactive substances. This was a phenomenon that raised concerns especially in relation to the Chernobyl accident since neglected forests areas were repeatedly theater of massive wildfires that led to the transportation of radioactive materials thousands of kilometers away⁷¹⁹.

Radioactive particles deposited, and kept depositing according to the mechanisms just described, also on all water resources, including water basins⁷²⁰. This led to the contamination of aquatic ecosystem which include edible fish⁷²¹; yet, water, if not directly ingested even unconsciously, is used for daily activities like irrigation, contributing to increase the radioactivity of the soil and, consequently, the radioactive contamination and exposure everything or everyone that comes in contact with it, including especially farmers, cattle and harvests. In addition radioactive water is drunk by wild animals that might be then hunted.

⁷¹⁵ Otaki J. M. (2016). ‘Fukushima’s lessons from the Blue Butterfly: A Risk Assessment of the Human Living Environment in the Post-Fukushima Era’, in *Integrated Environmental Assessment and Management*, Vol.12, No.4, p. 669.

⁷¹⁶ Yablokov A. V., Nesterenko V. B., Nesterenko A. V. (2010). *Chernobyl: Consequences of the Catastrophe for People and the Environment*. Boston: Blackwell, p.224.

⁷¹⁷ *Ibid.*, p. 225.

⁷¹⁸ *Ibid.*, p.233.

⁷¹⁹ Evangelidou N. at al. (2014). ‘Wildfires in Chernobyl-Contaminated forests and risks to the population and the environment: a new nuclear disaster about to happen?’, in *Environment International*, Vol.73, pp.346-358.

⁷²⁰ IAEA (2006). *Report of the Chernobyl Forum Expert Group ‘Environment’ – Environmental Consequences of the Chernobyl Accident and their Remediation: Twenty Years of Experience*. Vienna: IAEA, pp. 48-52.

⁷²¹ See *ibid.*, pp.53-60.

Moving to a more eco-centric perspective, it is necessary to point out that, in the same way radionuclides adversely impact human health, they cause genetic disorders, anomalies and mutations also to plants which can eventually lead to the death of the plant, either *per se* or because they make plants less resistant to fungi and bacteria⁷²². The same applies to animals that due to external and internal exposure (i.e. through inhalation and ingestion of radioactive food and water) to radiation incurred the development of illnesses, mutations and genetic changes, and reproductive abnormalities⁷²³. It stands to reason that all these negative effects of radiations on animals and plants have deleterious consequences on the biodiversity of the affected areas, which are not limited at all, and on the environmental equilibria. In this sense, the device of well-developed and strong regulatory frameworks for the strengthening of safety measures, and the undertaking of preventive or even precautionary measures, in accordance with the principle of due diligence, with the purpose of reducing the likelihood of nuclear accidents that have such deleterious impacts on the biodiversity, is an obligation States have which derives from the Convention on Biological Diversity. Indeed, it provides that the one of the objective of the convention is the conservation and protection of States' biological diversity (Article 1), that is of course jeopardized by the effects of radioactive contamination⁷²⁴.

A few lines above, fungi and bacteria were mentioned. In this regard, one of the most neglected aspects of radioactivity, which however is of utmost importance, is exactly the impact on micro-organisms such as bacteria, viruses and micro-fungi. Radioactivity-induced mutations of these organisms can potentially have catastrophic effects on all other living species, leading also to their death⁷²⁵. This does not refer solely to viruses, bacteria and fungi that are present in nature and that can attack and infect all species, but it also refer to those micro-organisms that naturally inhabit our body and that of other animals; in normal conditions they have an important regulatory and protective function but “[r]adiologically induced pathologic changes in the microflora in humans can increase susceptibility to infections, inflammatory diseases of bacterial and viral origin (influenza, chronic intestinal diseases, [...] asthma, dermatitis, and ischemia), and various pathologies of pregnancy”⁷²⁶.

⁷²² Yablokov A. V., Nesterenko V. B., Nesterenko A. V. (2010). *Chernobyl: Consequences of the Catastrophe for People and the Environment*. Boston: Blackwell, pp.237-250.

⁷²³ *Ibid.*, pp.259-273.

⁷²⁴ See UN (1992). Convention on Biological Diversity.

⁷²⁵ Yablokov A. V., Nesterenko V. B., Nesterenko A. V. (2010). *Chernobyl: Consequences of the Catastrophe for People and the Environment*. Boston: Blackwell, pp. 281-283.

⁷²⁶ *Ibid.*, p. 283.

Shifting the focus back on human beings and human rights, from this brief excursus on the environmental impact of radionuclides that are released in the event of nuclear accidents but also, though more limitedly, in the event of nuclear wastes mismanagement, it can easily be understood how the radioactive contamination of the environment threatens the enjoyment of many basic human rights, both of present and future generations. In this sense, environmental contamination jeopardize the enjoyment of the right to life, the right to health, the right to housing and property as already demonstrated, the right to the respect of private and family life, the right to water, the right to adequate food, especially in the context of rural, agricultural societies.

Concerning the right to water and the right to adequate food, as the Committee on Economic, Social and Cultural Rights stated in two different General Comments, they do not have to be interpreted narrowly, in terms of quantity and availability, but “the core content of the right to adequate food implies [also] the availability of food free [...] from adverse substances”⁷²⁷, and the right to water “entitles everyone to [...] safe [...] water for personal and domestic use [,since] [a]n adequate amount of safe water is necessary to [...] reduce the risk of water-related disease and to provide for consumption, cooking, personal and domestic hygienic requirements”⁷²⁸. In addition, the Secretary General of the UN Kofi Annan, in a message he delivered on the occasion of the World Water Day in 2001, stated that “[a]ccess to safe water is a fundamental human need and, therefore, a basic human right. Contaminated water jeopardizes both the physical and social health of all people. It is an affront to human dignity”⁷²⁹. This said, it must be acknowledged that the violation of the right to food and water in relation to environmental contamination caused by nuclear accidents is strictly dependent on the social and economic circumstances of the affected populations, and more generally also on the economic development and, sometimes related, emergency preparedness of the affected countries: if a nuclear accident occurs in the US, France, the same Japan or Canada, the urban character of the society, and the capabilities of the States, in terms of technical, organizational and economic means, are supposed to minimize the likelihood of important violations of the right to food and water, since rapid countermeasures can be taken. However, thought in theory there are the capabilities to avoid violation of the right to food and water,

⁷²⁷ CESCR (1999). CESCR General Comment No.12: The Right to Adequate Food (Art.11), E/C.12/1999/5), para. 8.

⁷²⁸ CESCR (2003). General Comment No. 15: The Right to Water (Arts. 11 and 12 of the Covenant) - Adopted at the Twenty-ninth Session of the Committee on Economic, Social and Cultural Rights, on 20 January 2003 (Contained in Document E/C.12/2002/11).

⁷²⁹ UN (2001). *Access to safe water fundamental human need, basic human right, says secretary-general in message on world water day*. Available at: <https://www.un.org/press/en/2001/sgsm7738.doc.htm> (accessed: 9 May 2021).

emergency preparedness plays a fundamental role: Japan had for sure the means to protect the population from the consumption of contaminated food and water, but it did not act accordingly: it adopted a negligent conduct exacerbated by fundamental unpreparedness, lack of organization and communication. The situation is different in nuclear but poor countries like India, Pakistan, Armenia, Iran characterized for the most part by rural societies based on subsistence. This was also the situation affecting the Soviet society at the time of the Chernobyl accident. In these countries with limited response capacities, the respect of the right to food and water can be guaranteed by the prompt intervention of international relief personnel that can supply safe food and water, so in these cases the device of clear and well-established rules in the field of IDRL are fundamental for the protection of fundamental human rights.

2.1. From the greening of human rights to the recognition of the right to a healthy environment: implications for access to justice in case of radioactive contamination.

The close link between environmental soundness and the enjoyment of human rights was officially recognized globally on the occasion of the 1972 Stockholm Conference on the Human Environment. From that point in particular, but even before, in the 60s, thanks to the campaigns of environmental movements, as the former and present Special Rapporteurs on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment, Mr. John H. Knox and Mr. David Boyd, stated in the 2018 report on the Right to a healthy and sustainable environment they prepared jointly,

human rights bodies have elaborated on the understanding that a healthy environment is of fundamental importance to the full enjoyment of a vast range of human rights. Treaty bodies, regional tribunals, special rapporteurs and other international human rights bodies have described how environmental degradation interferes with specific rights, including the rights to life, health, food, water, housing, culture, development, property and home and private life. In effect, they have “greened” existing human rights.

So, the first step that allowed the incorporation of environmental concerns in the system of human rights protection was the so-called greening of human rights, which means to consider the existing human right in an environmental perspective, consider how environmental degradation and environmental-related matters adversely impact the enjoyment of fundamental human rights. This

process of greening of human rights led to the fact that States had to respect a new set of obligations related to environment issues, being essential for the respect, protection and fulfillment of all those human rights whose enjoyment is jeopardized by environmental problems⁷³⁰. In this regard, Special Rapporteur Knox, always in 2018, issued the Framework Principles on Human Rights and the Environment, through which he clarified the procedural and substantive obligations States have with respect to environmental issues, in relation to human rights⁷³¹. In light of the discussion held in this chapter about the violation of human rights in the event of the two INES 7 nuclear disasters, but also what has been said in chapter 3 on the responsibility of the State, some principles are worth being reported, as they are listed by the UNHCR:

1. States should ensure a safe, clean, healthy and sustainable environment in order to respect, protect and fulfil human rights.
6. States should provide for education and public awareness on environmental matters.
7. States should provide public access to environmental information by collecting and disseminating information and by providing affordable, effective and timely access to information to any person upon request.
9. States should provide for and facilitate public participation in decision-making related to the environment, and take the views of the public into account in the decision-making process.
11. States should establish and maintain substantive environmental standards that are non-discriminatory, non-retrogressive and otherwise respect, protect and fulfil human rights.
13. States should cooperate with each other to establish, maintain and enforce effective international legal frameworks in order to prevent, reduce and remedy transboundary and global environmental harm that interferes with the full enjoyment of human rights.
14. States should take additional measures to protect the rights of those who are most vulnerable to, or at particular risk from, environmental harm, taking into account their needs, risks and capacities⁷³².

Summing up briefly, focusing on the Fukushima case, being temporally closer to the outlook expressed by these Principles, the Government failed to “ensure a safe, clean, healthy and

⁷³⁰ UNGA (2018). Human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment - Report of the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment, A/73/188, para. 13.

⁷³¹ UNHCR (2018). *Framework Principles on Human Rights and the Environment*. Available at: <https://www.ohchr.org/EN/Issues/Environment/SREnvironment/Pages/FrameworkPrinciplesReport.aspx> (accessed: 10 May 2021).

⁷³² Ibid.

sustainable environment” by adopting a negligent conduct⁷³³; it failed to respect Principle 6 perpetuating the myth of safety and even miseducating pupils about radiation risks⁷³⁴; it failed to promptly disseminate clear information about the environmental contamination caused by the release of radionuclides from the Fukushima NPP⁷³⁵; it failed to involve the public in decision-making, both before the accident and in the recovery phase⁷³⁶; it set retrogressive standards for radioactive exposure threshold⁷³⁷; it did not prevent transboundary harm, always due to fundamental negligence⁷³⁸; and it did nothing to take into account the needs of the women and children that are more vulnerable to radiations; on the contrary, by not providing essential information on radiation protection and enacting reckless policies, it even exposed children and women to unnecessary further doses of radiations (e.g. case of the lifting of evacuation orders, school trips at the damaged NPP and clean-up projects involving young students)⁷³⁹. In addition, the Special Rapporteur argued that “States must regulate business enterprises to protect against human rights abuses resulting from environmental harm and to provide for remedies for such abuses”⁷⁴⁰, another point that was not respected by the Japanese authorities that failed to adequately supervise TEPCO.

These principles can be used as a useful framework to assess the conduct of States and detect possible violations; in this sense, individuals and third States can bring claims in front of treaty bodies or regional courts alleging violations of human rights stemming from the failure to respect the duties set out in the Framework Principles. To be clear, of course they cannot file a complaint alleging the violation of, for instance, Principle 6, because they are soft-law but those Principles can be useful to identify the obligations States have and must respect on environmental-

⁷³³ See Chapter 3, paragraph 2: “Responsibility for and consequences of the nuclear accident at the Fukushima Daiichi NPP”

⁷³⁴ See Caldicott E. (2014). *Crisis without end*. New York: The New Press.

⁷³⁵ See Funabashi Y., Kitazawa K. (2012). ‘Fukushima in a review: a complex disaster, a disastrous response’, in *Bulletin of Atomic Scientists*, Vol.68, No.2, pp. 9-21.

⁷³⁶ See Khan K. J. (2018). ‘Post-Disaster Policy Decision-Making and the Prospects of Human Rights – The Case of Fukushima Daiichi Nuclear Power Plant Accident’, in *Sociology and Anthropology*, Vol.6, No.1, pp. 116-134, and Ulrich K. (2017). *Unequal Impact – Women’s and Children’s Human Rights Violations and the Fukushima Daiichi Nuclear Disaster*. Greenpeace Japan.

⁷³⁷ See World Nuclear Association. (2021). *Fukushima: Radiation Exposure*. Available at: <https://world-nuclear.org/information-library/safety-and-security/safety-of-plants/appendices/fukushima-radiation-exposure.aspx> (accessed: 15 May 2021).

⁷³⁸ See Chapter 3, paragraph 2: “Responsibility for and consequences of the nuclear accident at the Fukushima Daiichi NPP”.

⁷³⁹ See Caldicott E. (2014). *Crisis without end*. New York: The New Press, and Ulrich K. (2017). *Unequal Impact – Women’s and Children’s Human Rights Violations and the Fukushima Daiichi Nuclear Disaster*. Greenpeace Japan.

⁷⁴⁰ UNGA – Human Rights Council. (2018). Report of the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment, A/74/188, p.7, para. 17.

related issues, in order to ensure that human rights are not violated; if States fail to respect these obligations and this leads to an alleged violation of human rights, individuals or third states (in the name of the *erga omnes* nature of human rights) can file a complaint with regional courts or treaty-based bodies (after the exhaustion of domestic remedies)⁷⁴¹.

However, this last sentence hints at the main shortcoming of a mere greening of human rights, especially concerning the guarantee of a safe, clean, healthy and sustainable environment. Access to justice and remedy in the case of environmental degradation and the failure to respect and enforce environmental standards is dependent upon the presence of *clear and direct* repercussions on the enjoyment of human rights. Taking the rules about the admissibility of a case of the UCtHR, a complaint can be considered inadmissible for lack of evidence that can demonstrate the connection between an incident and a violation of human rights⁷⁴². If in some cases it is quite easy to demonstrate a causal link between environmental degradation and the violation of some human rights (e.g. in case of the violation of right to food because of its radioactive contamination, it is sufficient to measure the radioactivity of products, or in the case of the right to housing is jeopardized, not by major nuclear accidents or emergencies, but by the failure to contain radiation leaks from the mundane management of radioactive wastes or nuclear activities properly, it suffices to measure the radioactivity of the air and soil⁷⁴³), in other cases, like in the case of the right to life, the presence of an undisputed connection between environmental degradation and the violation of the human right is much more difficult to prove. It has already been demonstrated how in the specific case of radioactive contamination, the establishment of a clear link with the violation of the right to life is extremely problematic since, apart from cases of acute radiation syndrome and exposure to extremely high doses of radiations, also because of the presence of rather long latency periods for some illness, it is impossible to determine whether radiations led to premature death or to the impossibility of enjoying a life with dignity by causing the insurgence of severe illness, or the insurgence of that particular illness is caused by other genetic/biological factors⁷⁴⁴.

⁷⁴¹ To make an example, if for example France, like Japan did, had applied retrogressive measures, raising the standards for radioactive exposure from 1 to 20 mSv after a nuclear accident, it could be held responsible for the violation of the right to life by ECtHR, to the extent that the application of retrogressive environmental standards is clearly demonstrated to have exposed individuals to potentially deadly radiations.

⁷⁴² See ECtHR (2021). *Practical Guide on Admissibility Criteria*. Available at: https://www.echr.coe.int/documents/admissibility_guide_eng.pdf (accessed: 10 May 2021).

⁷⁴³ Here reference is made to non-emergency situations, because in the event of emergencies limitations and derogations of human rights enters into play. On the other hand, regular normal operation that cause radioactive leaks due to lack of due diligence and prevention jeopardize the right to "live somewhere in security, peace and dignity". See OHCHR (2009). *The Right to Adequate Housing*, Fact Sheet No. 21 (Rev.1). Geneva: United Nations.

⁷⁴⁴ See Fraser D. K. (2011). 'Latency period for radiation-induced cancer', in *Canadian Medical Association Journal*, Vol.183, No. 17, p.2017.

For this reason, over the last decades, and especially since 1972, the idea of the need to recognize an independent right to a healthy environment took hold and “the right to a healthy environment has gained widespread public and legal recognition across the world”⁷⁴⁵. In their already-mentioned 2018 joint report, the Special Rapporteurs Knox and Boyd evidenced that

[g]overnments have incorporated it into constitutions and environmental legislation. The right to a healthy environment has also been incorporated into regional human rights agreements and regional environmental treaties⁷⁴⁶. [...] Over the past forty years, national courts, regional tribunals, treaty bodies, special procedures and many international institutions have contributed to defining the content, scope and parameters of the right to a healthy environment, as well as its relationship with other human rights.⁷⁴⁷

In outlining the boundaries and content of the right to a healthy environment, as an individual stand-alone right, the Inter-American Court of Human Rights played a key role. In particular, the 2017 Advisory Opinion OC-23/17 on the Environment and Human Rights was groundbreaking. From it, it is possible to read that

[t]he human right to a healthy environment has been understood as a right that has both individual and also collective connotations. In its collective dimension, the right to a healthy environment constitutes a universal value that is owed to both present and future generations. That said, the right to a healthy environment also has an individual dimension insofar as its violation may have a direct and an indirect impact on the individual owing to its connectivity to other rights, such as the rights to health, personal integrity, and life⁷⁴⁸.

The key to understand the difference between a simple greening of human rights and the recognition of the right to a healthy environment is contained in the phrase “*may* have a direct and an indirect impact on the individual owing to its connectivity to other rights”: when we apply a

⁷⁴⁵ UNGA (2018). Human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment - Report of the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment, A/73/188, para. 29.

⁷⁴⁶ E.g. the African Charter on Human and People’s Rights (Article 24); the Additional Protocol to the American Convention on Human Rights in the Area of Economic, Social and Cultural Rights (Article 11).

⁷⁴⁷ UNGA (2018). Human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment - Report of the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment, A/73/188, para. 29.

⁷⁴⁸ Inter-American Court of Human Rights (2017). Advisory Opinion OC-23/17 of November 15, 2017 Requested by the Republic of Colombia, p.26, para.59.

simple greening of human rights, the right to a healthy environment *per se* is not present but the importance of environmental degradation acquire significance only to the extent that it clearly impact the enjoyment of other human rights. As already said, this means that access to justice and remediation is dependent upon the demonstration of a connection, a causal link between environmental degradation and the violation of other rights. On the other hand, if the right to a healthy environment is recognized as an independent right, it means that in case of environmental degradation, possible complainants do not have to resort to the invocation of the violation of other human rights jeopardized by environmental problems (with the ensuing problems of demonstration of causation), but they can simply claim that their right to a healthy environment has been violated⁷⁴⁹. As a consequence, people affected by radioactive contamination have the possibility to bring cases against the State for its failure to respect its obligations to ensure the protection, respect and fulfillment of the right to a healthy environment, claiming that it *may* have a direct or indirect impact on their other human rights.

It stands to reason that when a clear link between environmental degradation and human rights is difficult to be established, the possibility of invocation of the violation of the right to a healthy environment, based on the claim that States did not take “reasonable measures to prevent pollution and ecological degradation, to promote conservation, and to secure an ecologically sustainable development and use of natural resources, as well as to monitor projects that could affect the environment”⁷⁵⁰ is of fundamental importance.

Starting from the previous quotation, it is possible to open up a brief incidental discussion centered not only on the consequences of nuclear accidents, but which also considers the development of a nuclear industry more broadly. As the previous quotation suggests, the right to a healthy environment is closely linked to the concept of sustainable development. It is useful to recall that, according to the most famous definition provided by the Brundtland Commission, sustainable development refers to the idea of “meeting the needs of the present generation without compromising the ability of future generations to meet their own needs”⁷⁵¹. Now, the development of the nuclear industry is dictated by the need of present generations to increasing amounts of energy, that is fundamental for the enjoyment of several basic human rights, the most evident of

⁷⁴⁹ ESCR-net (2019). *Advisory Opinion OC-23/17*. Available at: <https://www.escr-net.org/caselaw/2019/advisory-opinion-oc-2317> (accessed: 16 May 2021).

⁷⁵⁰ Inter-American Court of Human Rights (2017). *Advisory Opinion OC-23/17 of November 15, 2017 Requested by the Republic of Colombia*, para. 61.

⁷⁵¹ EUR-Lex (n.d.). *Glossary of summaries – sustainable development*. Available at: https://eur-lex.europa.eu/summary/glossary/sustainable_development.html (accessed: 16 May 2021).

which is the right to an adequate standard of living. Someone may also argue that it also answer to the need to cope with climate change, but whether nuclear energy really helps in addressing this need will be the subject of the next chapter. However, human beings have other fundamental needs that can be summarized in the human need to live in safe conditions, including the need to enjoy a healthy environment, that, according to the Inter-American Court of Human Rights, is a need and a right that is owed to both present and future generations. This need is threatened not only by the risk of nuclear accidents, but also by the consequences caused by uranium mining, and the dangers linked to the still unsolved problem of management of radioactive waste. In addition, the problem of deep environmental contamination caused by possible nuclear accidents and of nuclear wastes threatens the needs not only of today's generation, but also, and especially in the case of the problem of nuclear waste, of future generations. Thus, being a threat to the needs of present generations and the generations to come, nuclear energy hardly fit the definition of sustainable development, as conceived by the Brundtland Commission.

Going back to the issue of the recognition of the right to a healthy environment as an independent universal right, it must be stressed that, despite its recognition in national constitutions and legislation, and regional instruments and bodies, it has not been recognized by the UNGA, other bodies of the UN, or enshrined in any international treaty. The Special Rapporteurs Knox and Boyd acknowledged this gap in their 2018 report (Boyd then reiterated it in the following year's report on clean air⁷⁵²) and urged the UN to recognize the existence of an independent human right to a healthy environment through a new international treaty, a protocol to an existing treaty, or a UNGA resolution⁷⁵³. They also identified the main benefits that are supposed to arise from such move: the international acknowledgement of the existence of a right to a healthy environment would strengthen the understanding of the importance of environmental protection for the enjoyment of fundamental human rights; linked to the former point and to the need to comply with international disposition, it would set in motion a process of continuous, consistent and homogeneous development and implementation of norms and standards related to the environment, making the right to a healthy environment enforceable and justiciable at the national level but also in front of international courts; finally, it would raise organizations and people's standing because of the procedural aspects pertaining to the right (i.e. involvement in decision-making and access to

⁷⁵² See UNGA (2019). Issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment – Report of the Special Rapporteur, A/HRC/40/55.

⁷⁵³ UNGA (2018). Human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment - Report of the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment, A/73/188, paras. 46-48.

information), but more simply knowing that they are entitled to the right to a healthy environment, they will lobby governments to respect, protect and fulfill it, thus leading to an improvement of environmental conditions⁷⁵⁴.

In this sense, the international recognition of the right to a healthy environment would be very beneficial in the context of nuclear energy-related issues. Being the production of nuclear energy an activity that can fundamentally threaten the right to a healthy environment, as demonstrated in the previous section, its recognition would push or even compel States⁷⁵⁵ to involve stakeholders in any decision that can affect it (e.g. the decision by the Japanese government to discharge the Fukushima radioactive water into the sea or the lifting of evacuation orders), including emergency preparedness, being fundamental to reduce the impact of accidents on the environment, to provide any relevant information on the state of NPP without defending an abstract myth of safety and provide prompt notices about actual or even possible situations that can lead to radioactive contamination, accompanied by clear instruction on what to do or not to do, and to adapt and maintain the standards of protection from radioactive exposure in line with international dispositions.

Moreover, the increasing international attention and pressure that would follow the recognition of an independent right to a healthy environment on the actions and measures that States take to ensure its respect may also further boost projects to strengthen the degree of nuclear safety worldwide; second, becoming aware of their internationally-recognized right to live in a healthy environment, people could organize and, through the involvement of independent competent figures (e.g. seismologists, geologists, engineers, biologists), check on the regulatory and supervisory activity of the nuclear States authorities, and, in case, force them to take action in order to ensure the maximum possible level of nuclear safety, in the name of their right to a healthy environment⁷⁵⁶. Finally, the recognition of the right through the adoption of a binding treaty or a binding protocol to an international treaty (supposedly the ICESCR), can open up the possibility, in

⁷⁵⁴ Ibid., paras. 39-44.

⁷⁵⁵ This depends on the instrument in which the right to a healthy environment will be included, or even the possible recognition of the right as customary law given the extensive *opinio juris* on it. Of course, the adoption of any international instrument is always subject to State consent, but the already wide-spread recognition of the right to a healthy environment, coupled with its international recognition through whatever means is supposed to increase considerably the pressure on States that deny it by the international community and domestic subjects, pushing to conduct changes.

⁷⁵⁶ See Inter-American Court of Human Rights (2017). Advisory Opinion OC-23/17 of November 15, 2017 Requested by the Republic of Colombia and UNGA (2018). Human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment - Report of the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment, A/73/188.

case of violations by states that ratified it, of resorting to international justice, through different channels. For example, supposing that the right to a healthy environment is included in a protocol to the ICESCR, both States and individuals could bring complaints against a States that ratified the Optional Protocol in front of the Committee on Economic, Social and Cultural Rights alleging the violations of the right to a healthy environment e.g. for the failure to take adequate preventive measures. By adopting a non-binding but highly authoritative View, the Committee might rule that the defendant States adopts or strengthen preventive measures in order to protect the right to a healthy environment. If we apply this possibility to the a situation similar to that of the Fukushima disaster⁷⁵⁷, in light of all the evidence existing before the disaster that preventive measures and safety standards were inadequate (see Chapter 3, para. 2.1), a government might have been pushed by the Committee to take steps, and those steps might have avoided a disaster. The same mechanism could apply for an event similar to that of Japan decision to discharge radioactive water into the sea: in that case the Committee might rule that, in the name of the respect of the right to a healthy environment, the precautionary principle must be applied, and operations stopped until certainty on the impact of the measure is achieved.

Finally, it can be argued that an implicit hint at the right to a healthy environment in the context of nuclear activities is contained in the already-mentioned ICJ Advisory Opinion on the Legality of the Threat or Use of Nuclear Weapons. A passage contained in paragraph 29 states that “[t]he Court recognizes that the environment is under daily threat and that the use of nuclear weapons could constitute a catastrophe for the environment. The Court also recognizes that the environment is not an abstraction but represents the living space, the quality of life and the very health of human beings, including generations unborn”⁷⁵⁸. The ICJ, thus, recognized the importance of the environment as a living space, as a space whose healthiness is fundamental for the enjoyment of fundamental rights human beings have, primarily the right to life and health. In this context radioactivity released by nuclear weapons, but the reasoning can be applied to radioactive contamination arising from accidents at NPP, is a major threat. Moreover, in the passage, it is already underlined how the quality of our living space, jeopardized by radioactive contamination, impacts not only present but also future generations, thus indirectly introducing the dual connotation (individual and collective) of the right to a healthy environment.

⁷⁵⁷ *Similar to* is specified and the Fukushima case is not applied directly because Japan has not ratified the Optional Protocol to the ICESCR yet, thus it has not accepted the jurisdiction of the Committee on Economic, Social and Cultural Rights.

⁷⁵⁸ ICJ (1996). Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion of 8 July 1996, para. 29.

2.2. The human right to a healthy environment VS the right to a healthy environment per se: possible implication of a more eco-centric approach on the production of nuclear energy.

The previous discussion on the right to a healthy environment was based on an anthropocentric point of view on the environment: the soundness of the environment acquire a paramount importance to the extent that it affects human rights, therefore we talk about the right to a healthy environment as a fundamentally *human* right⁷⁵⁹. However, the international debate, pushed also by the rising importance of and pressure exercised by international environmental organizations, increasingly turned the attention to the need of adopting a more and more holistic approach to environmental problems and protection that considers the environment important not only because of its direct impact on human being, but also for the broader equilibrium of our planet and all the species that inhabit it. For this reason, there is the need to broaden the scope of the right to a healthy environment so as to comprise not only the human right to live in a sound environment but also the rights of the nature or the rights of the environment⁷⁶⁰, where the two components are complementary and mutually reinforcing. Again, in pushing for a right to a healthy environment characterized by an eco-centric approach and not a mere anthropocentric one, the Inter-American Court of Human Rights in the aforementioned groundbreaking Advisory Opinion proved its cutting-edge attitude towards the matter; indeed, in it, it is claimed that

[t]he Court considers it important to stress that, as an autonomous right, the right to a healthy environment, unlike other rights, protects the components of the environment, such as forests, rivers and seas, as legal interests in themselves, even in the absence of the certainty or evidence of a risk to individuals. This means that it protects nature and the environment, not only because of the benefits they provide to humanity or the effects that their degradation may have on other human rights, such as health, life or personal integrity, but because of their importance to the other living organisms with which we share the planet that also merit protection in their own right⁷⁶¹.

⁷⁵⁹ De Vido S. (2020) 'Climate change and the right to a healthy environment', in De Vido S., Baldin S. (eds.) *Environmental Sustainability in the European Union: Socio-Legal Perspectives*. Trieste: EUT Edizioni Università di Trieste, p.111.

⁷⁶⁰ See Rodriguez-Rivera L. E. (2020). 'The Human Right to Environment and the Peaceful Use of Nuclear Energy', in *Denver Journal of Law & Policy*, Vol.35, No.1, pp. 173-192.

⁷⁶¹ Inter-American Court of Human Rights (2017). Advisory Opinion OC-23/17 of November 15, 2017 Requested by the Republic of Colombia, para. 62.

This paragraph defined in clear terms the content of the right to a healthy environment, meant in broader terms, not just as a human right.

Now, the main question is the following: is the recognition of a broader right to a healthy environment that embodies an more holistic approach supposed to strengthen the regulations and standards of protection attached to the production of nuclear energy? The consolidation of a right to a healthy environment is undoubtedly of paramount importance; however, considering the consequences that the production of nuclear energy have on the environment, which are basically linked to the release of radioactive materials in all the stages of the productive chain, from mining to the storage of nuclear waste, it seems that the recognition of a stand-alone *human* right to a healthy environment is sufficient to attain the maximum level of protection for all species that can be affected by radiations. Indeed, the broader right to a healthy environment is instrumental to protect nature when its protection is not ensured by the protection of human rights because some forms of environmental degradation might not have an immediate and evident repercussion on the enjoyment of human rights (e.g. the cutting of a wood). If we consider radioactive contamination, in every conceivable case, it has evident impacts on the enjoyment of a wide set of human rights, including the human rights to a healthy environment; in other words, there are no consequences of radioactive contamination stemming from the different phases of nuclear energy production that can have negative impacts on the environment, without being felt by human beings and without touching the enjoyment of their human rights. Therefore, the strengthening of regulations, standards and requirements linked to all activities related to nuclear energy production, including emergency preparedness, for the protection of human rights, automatically ensure the highest possible degree of protection also of the rights of the nature.

Possibly, the only additional achievement that can be attained in the context of nuclear energy production, thanks to the recognition of the right to a healthy environment, has to do with the siting of NPP and nuclear wastes facilities, and places where mining activities are carried out. In this sense, what can be protected is the beauty and the intrinsic naturalistic value of some areas that have long been acknowledge to be part of the concept of sustainable development⁷⁶². Here, reference goes to the facts of the case *Sierra Club v. Morton* (1971) that reached the US Supreme Court⁷⁶³.

⁷⁶² See Blewitt J. (2018). *Understanding sustainable development*. 3rd edn. Routledge.

⁷⁶³ See Oyez (n.d.). *Sierra Club v. Morton*. Available at: <https://www.oyez.org/cases/1971/70-34> (accessed: 23 May 2021).

3. International State responsibility for the violation of human rights.

Throughout the previous sections, it has already been implicitly pointed how, in the particular cases analyzed, State's authorities undisputedly played a role in the violation of human rights linked to the Chernobyl and Fukushima nuclear disasters, because of their negligence and unpreparedness. However, to have a complete picture, two more issues have to be taken into account: first, is the State the only actor which has responsibilities in the context of human rights protection, respect and fulfillment? Second, in connection with nuclear disasters and the actual situations described above, can the State be generally held responsible for human rights violations, or in some cases the non-full enjoyment of human rights is justified and legitimized by limitations and derogations, due to the gravity and circumstances of the event?

3.1. State Responsibility and Corporate Responsibility: the Duty to Protect.

With the growing power of companies and especially multinational corporations, there is an increasing awareness on the fact that States should not be the single ones to bear responsibilities in terms of human rights, but, exactly because of their power and capabilities, businesses should be equally engaged in the protection and respect of human rights in the context of their activities. In this regard, there are three soft-law instrument that delve into the matter of possible business responsibilities: the Guiding Principles on Business and Human Rights (also called Ruggie's Principles from the surname of the Special Representative of the Secretary-General on the issue of human rights and transnational corporations and other business enterprises, John Ruggie who developed them⁷⁶⁴), the OECD Guidelines for Multinational Enterprises, and the UN Global Compact.

The underlying principles contained in the three instrument are rather overlapping, namely they all put forward the same overall tenets regarding business responsibilities in the field of human rights protection and respect. For this reason, as a matter of space, the substantive discussion below related to business conduct will be substantially based on the OECD guidelines, but the precepts described are endorsed also by the other instruments. This choice has been done for a simple reason: though the Ruggie's Principles and the Global Compact belong to the UN system, so that they have a potential wider global application, the OECD Guidelines "are the only multilaterally

⁷⁶⁴ UN (2011). Guiding Principles on Business and Human Rights – Implementing the United Nations "Protect, Respect and Remedy" Framework.

agreed and comprehensive code of responsible business conduct that governments have committed to promoting”⁷⁶⁵, on a voluntary basis, and they provide for a peculiar binding mechanism of implementation based on National Contact Points (NCPs) which are “agencies established by adhering governments to promote and implement the Guidelines”⁷⁶⁶, as well as providing assistance and guidance to stakeholders on appropriate measures and steps they can take to appropriately implement the Guidelines. This means that once they are voluntarily adopted by States they have the potential to have a greater impact on business conduct. To be clear, companies are not bound to respect the Guidelines, but what is binding is the system of NCPs and the promotion by States of the principles; in addition, some of the tenets can be binding on businesses to the extent that they are contained in national law or other forms of international commitments entered by enterprises. Moreover, regarding the scope of application, it is important to note that, despite the title makes reference to Multinational enterprises, the Guidelines “reflect goods practices for all”⁷⁶⁷, both multinational and national domestic companies.

Going more in depth in what the OECD Guidelines stipulate, they explicitly stated in the text that “[t] common aim of the governments adhering to the Guidelines is to encourage the positive contributions that multinational enterprises can make to economic, environmental and social progress and to minimise the difficulties to which their various operations may give rise”⁷⁶⁸, by promoting good practices. In this sense, enterprises are supposed to behave in such a way as to respect internationally-recognized fundamental human rights (especially those related to public health and safety), and the environment⁷⁶⁹, which is of course linked to human rights enjoyment, and that can be affected by their operations and activities (both in terms of actions and omissions). Second, they are urged to engage in prevention of violations, and, when prevention is not enough to avert violations, to take prompt action to put an end and minimize the impact of possible interferences with the enjoyment of human rights. In order to achieve this protection and respect of human rights, the OECD Guidelines, but also the other two instruments, identify two main tools or means: human rights due diligence, and stakeholders’ involvement and transparency.

Regarding human rights due diligence, the degree of due diligence to be applied by enterprises is said to be proportional to the risk of interference of their activities with human rights, which depends on the size of the enterprise and, most importantly for the present discussion, the nature

⁷⁶⁵ OECD (2011). *OECD Guidelines for Multinational Enterprises*. OECD Publishing, p. 3.

⁷⁶⁶ *Ibid.*

⁷⁶⁷ *Ibid.*, p.18.

⁷⁶⁸ *Ibid.*, p. 15.

⁷⁶⁹ *Ibid.*, p. 42.

of the operations in which they are engaged (e.g. potentially highly polluting, contaminating or poisoning activities). Due diligence presupposes a careful process of analysis of the actual and even possible impact of activities on human rights, and the taking of actions based on the impact assessment findings to minimize and prevent the identified adverse impacts⁷⁷⁰. Consistent with the idea of due diligence, the Guidelines point out a fundamental aspect: “[...]where there are threats of serious damage to the environment, taking also into account human health and safety, [it is not possible to] use the lack of full scientific certainty as a reason for postponing cost-effective measures to prevent or minimise such damage”⁷⁷¹. This leads to two main implications: first, the need to carry out careful impact assessments to evaluate the possible harm that activities can cause to the environment and human safety⁷⁷², in normal and exceptional circumstances; second, the indication to refraining from postponing measures in the presence of lack of scientific certainty implies the application of the precautionary principle, which is also the core of Principle 7 of the UN Global Compact⁷⁷³. This is extremely relevant in light of the discussion on TEPCO’s conduct before the Fukushima disaster, held in Chapter 3 in the context of the assessment of Japan’s responsibility for the accident. In addition, the Guidelines consider that due diligence also means caring about human capital education and training⁷⁷⁴, which is a fundamental part of the safety culture and was one of the main elements that was lacking in the event of the two nuclear disasters of Chernobyl and Fukushima.

On the other hand, stakeholder involvement refers to committing to “interactive processes of engagement with relevant stakeholders, through, for example, meetings, hearings or consultation proceedings”⁷⁷⁵, where interactive makes reference to the fact that it has to be a mutual exchange of ideas, concerns and solutions. What underlies this process is the presence of transparency and information disclosure that can enhance the general public knowledge and awareness of the enterprise activities and their impact⁷⁷⁶, both positive and negative. Only in this way stakeholder involvement can be constructive and hopefully lead to mutually beneficial improvements.

It is clear that especially due diligence, which is the requirement that really enables to prevent and minimize nuclear accidents, was not present in the event of Chernobyl and Fukushima disaster;

⁷⁷⁰ Ibid., p. 34, para.45.

⁷⁷¹ Ibid., p. 43, para.4.

⁷⁷² Ibid., p. 45, para.67.

⁷⁷³ Ibid., p.45, para. 68 and United Nations Global Compact (n.d.). *The Ten Principles of the UN Global Compact*. Available at: <https://www.unglobalcompact.org/what-is-gc/mission/principles> (accessed: 20 May 2021).

⁷⁷⁴ Ibid., p. 46, para.73.

⁷⁷⁵ Ibid., p. 25, para.25.

⁷⁷⁶ Ibid., p. 28, para.28.

however, it always have to be kept in mind that these principles have been developed extensively in the last decade, so they do not really fit the historical context in which the Chernobyl disaster took place. On the other hand, they are instrumental to assess TEPCO conduct and, through it, understand what could be the main shortcomings of today's management of the nuclear energy production cycle. TEPCO failed to apply due diligence because it did not take adequate measures of prevention, even in the presence of scientific evidence and projections, and anyway the precautionary principle was applicable⁷⁷⁷; employees were not adequately trained because it has been demonstrated how the emergency was exacerbated by human incompetence⁷⁷⁸; important failures to act diligently were also identified in the context of the management of contaminated water⁷⁷⁹. Without re-examining all the problematic issues already underlined in Chapter 3, TEPCO did not take all possible measure to prevent and minimize the impact its activities have on the enjoyment of basic human rights, so that its failures led to the compromise of people's right to life, health, housing and hence forth.

As it has already been hinted at above, it should be noted that many of the requirements that apply to the concept of human rights due diligence, including the strengthening of NPPs safety, in terms of equipment, structure and organization, employees education to get them to understand the risks entailed in each action they are required to perform, and training in order for them to be able to carry out their tasks with competence, as well as having the necessary preparation to respond to crises, are part of the idea of safety culture⁷⁸⁰. Therefore, the development of a strong safety culture is a fundamental aspect of companies' human-rights due diligence, since having a strong safety culture means caring about and paying considerable attention to the development and application of the necessary instruments to prevent and minimize the impact of nuclear production-related activities on the environment and human rights.

Even though, as already pointed out, the overall principles underlying the OECD Guidelines, the Ruggie's Principles and the UN Global Compact are comparable, there is an important point that differentiates the UN Global Compact from the other two instruments: the Global Compact

⁷⁷⁷ See Chapter 2, paragraph 2 "Responsibility for and consequences of the nuclear accident at the Fukushima Daiichi NPP.

⁷⁷⁸ See Funabashi Y., Kitazawa K. (2012). 'Fukushima in a review: a complex disaster, a disastrous response', in *Bulletin of Atomic Scientists*, Vol.68, No.2, pp.9-21.

⁷⁷⁹ See Chapter 2, paragraph 2.1.1.

⁷⁸⁰ See IAEA (1991). Safety Culture – a report by the International Nuclear Safety Advisory Group, Safety Series No.75_INSAG-4, p.3.

Principles are addressed directly to companies⁷⁸¹ that can voluntarily endorse them and pledge to implement and respect them in the context of their activities. Among the thousands of companies that endorsed the Global Compact there are some which deal with the production of nuclear energy: State Atomic Energy Corporation (Russian Federation), Eletronuclear – Eletrobras Termonuclear S.A. (Brazil), SPIE Nucleaire (France)⁷⁸². On the other hand, the other two instruments are addressed to States which then engage in their promotion. Looking at the States that adhered to the OECD Guidelines, it is interesting to note that 21 countries, out of a total of 46, are nuclear States (Argentina, Brazil, Canada, Finland, France, Germany, Hungary, Japan, United States, United Kingdom, Ukraine Sweden, Spain, Belgium, Czech Republic, Switzerland, Slovak Republic, Mexico, Romania, Slovenia, Netherlands)⁷⁸³. This means that, to the extent that States are bound to promote the principles enshrined in the Guidelines, there might be considerable improvements in the attention paid to human rights respect and protection in the context of nuclear activities. However, the fact remains that all three instruments are soft law, so no case can be brought in front of courts for their alleged violation *per se* (the only possibility to make them indirectly justiciable is the possibility of including the principles they set out in binding national law or other binding international agreements), and their application is based on the willingness of companies and the influence, or better pressure, exercised by the civil society.

Nevertheless, if, on the one hand, enterprises do not have internationally legally binding obligations, on the other, those which have clear obligations are States. States are legally obliged to protect, respect and fulfill human rights which translates into that fact that they also have a duty to protect individuals from violations perpetrated by third parties under their jurisdiction, including enterprises⁷⁸⁴. So, even though enterprises theoretically have a responsibility to protect human rights, if they fail to do so or they show a lack of due diligence that can give rise to problematic situations, the State is obliged to take all possible measures to ensure the protection of individuals from human rights violations.

⁷⁸¹ The official website defines the Global Compact as “a call to companies to align strategies and operations with universal principles on human rights, environment and anti-corruption, and take action that advance societal goals”. See United Nations Global Compact (n.d.). *who we are*. Available at: <https://www.unglobalcompact.org/what-is-gc> (accessed: 20 May 2021)

⁷⁸² United Nations Global Compact (n.d.). *Explore our participants*. Available at: <https://www.unglobalcompact.org/interactive> (accessed: 20 May 2021).

⁷⁸³ See OECD (n.d.). *Responsible Business Conduct – OECD Guidelines for Multinational Enterprises*. Available at: <https://mneguidelines.oecd.org/about/> (accessed: 20 May 2021).

⁷⁸⁴ UNGA (2008). *Protect, Respect and Remedy: a Framework for Business and Human Rights - Report of the Special Representative of the Secretary-General on the issue of human rights and transnational corporations and other business enterprises*, John Ruggie, A/HRC/8/5, p. 4, para.9.

The States' duty to protect, together with corporate responsibility and the enhancement of access to remedies for human rights violations perpetrated by enterprises, is one of the three pillars of the Guiding Principles on Business and Human Rights. They define the duty to protect as the obligation States possess "[to] protect against human rights abuse within their territory and/or jurisdiction by third parties, including business enterprises. This requires taking appropriate steps to prevent, investigate, punish and redress such abuse through effective policies, legislation, regulations and adjudication"⁷⁸⁵. In order to achieve this aim, always according to the Ruggie's principles, States are required to enforce relevant laws and checks regularly the adequacy of these laws to guarantee protection, promote business transparency and stakeholders involvement (considered particularly important when the activities in question have a high potential risk of jeopardizing the enjoyment of human rights) and issue instructions and recommendations to enterprises on how to respect human rights⁷⁸⁶. Moreover, States shall perform an important oversight function "in order to meet their international human rights obligations when they contract with, or legislate for, business enterprises to provide services that may impact upon the enjoyment of human rights"⁷⁸⁷. From the assessment of the conduct of both Soviet and Japanese authorities held in Chapter 3, it has repeatedly been underlined how there was the inability, or even unwillingness, to adequately supervise nuclear activities; in the case of Japan, authorities failed to strengthen the nuclear regulatory framework satisfactorily, but most importantly they failed to compel TEPCO to implement and respect existing safety standards; in addition, Japanese regulators did not only fail to perform their duties, but they also pushed TEPCO in the wrong direction when they suggested that the Niigata prefecture had to refrain from carrying out an emergency preparedness exercise simulating an earthquake, but instead to base it on heavy snow because an exercise for emergency preparedness in case of earthquakes, that are very frequent in Japan, would unnecessarily cause anxiety and apprehension in the population; yet, as also underlined by the Convention on Nuclear Safety that *binds* states to enhance emergency preparedness, appropriate tests for emergency preparedness are vital to act promptly and effectively in real cases, thus averting or minimizing the impact of nuclear emergencies on the population.

The Ruggie's Principles delve also into the State-business link and specify something that is relevant in the context of the Chernobyl accident: "States should take additional steps to protect against

⁷⁸⁵ UN (2011). Guiding Principles on Business and Human Rights – Implementing the United Nations "Protect, Respect and Remedy" Framework, p. 3.

⁷⁸⁶ Ibid., pp. 4-6.

⁷⁸⁷ Ibid., p. 8.

human rights abuses by business enterprises that are owned or controlled by the State [...] Where a business enterprise is controlled by the State or where its acts can be attributed otherwise to the State, an abuse of human rights by the business enterprise may entail a violation of the State's own international law obligations"⁷⁸⁸. It has already been accurately described how the lack of due diligence on the part of Soviet authorities played a key role in the outbreak of the accident; now, that lack of due diligence constituted a fundamental breach of the State duty to protect its population from human rights abuses.

To conclude and sum up, private businesses have the theoretical responsibility to protect human rights, but practically, also due to the fact that there is still a harsh debate on whether companies are fully-fledged subjects of International Law, they do not have any obligation under public international law. On the other hand, however, States, being the ultimate human rights trustees, bear the responsibility to establish and enforce a strong domestic legislative framework to discipline enterprises' operations and ensure the respect of human right, as well as overseeing their activities, as corollary of their international obligations to protect, respect and fulfill human rights. For this reason, even if a given human rights violation materially arose from an enterprise activity, States might be held internationally responsible for that violation because they failed to adequately perform their duty to protect the population from third-parties operations, and in this way failed to respect their obligation to protect human rights. According to the analysis carried out in the previous chapter that highlighted the fundamental negligence and lack of due diligence on the part of the relevant governmental authorities, this is exactly the situation that occurred both in the case of the Chernobyl and Fukushima accidents.

3.2. Limitations, Derogations to Human Rights and Force Majeure.

In the event of nuclear emergencies and nuclear accidents the full enjoyment of human rights by the effected individuals is evidently jeopardized. However, in such delicate situations there are two aspects to take into account in order to judge whether there is an actual violation of human rights and/or whether the non-full enjoyment of human rights, or even the complete lack of respect, is justified by the circumstances: limitations and derogations to human rights⁷⁸⁹. The issue of limitations and derogations refers especially to the enjoyment of civil and political rights, because

⁷⁸⁸ Ibid., pp. 6-7.

⁷⁸⁹ Sommaro E. (2012). 'Derogation from Human Rights Treaties in Situations of Natural or Man-Made Disasters' in de Guttry et al. (eds.) *International Disaster Response Law*. 1st edn. The Hague: T.M.C. Asser Press, pp. 323-352.

in the case of economic, social and cultural rights there are some complications that will be explored subsequently⁷⁹⁰. Limitations and derogations stem from the idea that only a handful of human rights are considered absolute, even though an important development concern the fact that “[there] has been the strengthening and expansion of the core rights from which no derogation is possible”⁷⁹¹; these absolute rights are listed in Article 4 of the ICCPR, Article 27 (2) of the American Convention on Human Rights and Article 15 of the European Convention on Human Rights. Taking into account the ICCPR as an international instrument, absolute rights are: the right to life, the right not to be subject to torture, inhuman or degrading treatment, freedom from slavery and servitude, freedom from imprisonment for inability to fulfil a contractual obligation, prohibition against the retrospective operation of criminal laws (*nulla poena sine lege*), right to recognition before the law, freedom of thought, conscience and religion⁷⁹². Interestingly, the African Charter does not provide for any possible derogation but, in Article 27(2) it is simply stated that “[t]he rights and freedoms of each individual shall be exercised with due regard to the rights of others, collective security, morality and common interest”.

So, those rights that do not fall under the abovementioned articles can be subject, first of all, to limitations. A limitation is a completely *legitimate* constraint to the individual’s full enjoyment of human rights that is applied in order to protect a collective interest, which generally refers to “national security or public safety, public order (*ordre public*), the protection of public health or morals or the protection of the rights and freedoms of others”⁷⁹³. There are some conditions that must be respected when limitations to human rights are imposed: the possibility to apply them “must be provided for by the national law in force at the relevant time, [... and] limitations cannot be applied in an arbitrary, unreasonable, or discriminatory manner”⁷⁹⁴; in addition, they must be necessary and proportionate to the achievement of the protection of a public interest⁷⁹⁵. In this light, it stands to reason that in the event of a nuclear emergency or an actual nuclear accidents some human rights can be limited legitimately because it is a *necessary* measure for the protection

⁷⁹⁰ Ibid. pp. 347-348.

⁷⁹¹ Economic and Social Council (1995). Eighth annual report and list of States which, since 1 January 1985, have proclaimed, extended or terminated a state of emergency, presented by Mr. Leandro Despouy, Special Rapporteur appointed pursuant to Economic and Social Council resolution 1985/37, UN Doc. E/CN.4/Sub2/1995/20, para.16.

⁷⁹² See Australian Government – Attorney-General’s Department (n.d.) *Absolute Rights*. Available at: <https://www.ag.gov.au/rights-and-protections/human-rights-and-anti-discrimination/human-rights-scrutiny/public-sector-guidance-sheets/absolute-rights> (accessed: 20 May 2021). This are the rights considered non-derogable under the ICCPR which correspond to Articles 6,7,8 (paragraphs 1 and 2), 11, 15, 16, and 18.

⁷⁹³ ICCPR, Article 21.

⁷⁹⁴ Sommaro E. (2012). ‘Derogation from Human Rights Treaties in Situations of Natural or Man-Made Disasters’ in de Guttery et al. (eds.) *International Disaster Response Law*. 1st edn. The Hague: T.M.C. Asser Press, p. 326.

⁷⁹⁵ Ibid.

of public order, security and health; in this case, even though there is an individual restriction of the enjoyment of a given non-absolute right, there is no violation because the measure is legitimate and made necessary due to the gravity of the situation. Rights that can be limited in case of nuclear emergencies are, for instance, the freedom of movement that is essential to interdict the access to contaminated territories and ensure the protection of public health; the right to housing, as already explained, could be limited for the same reason through the issuance of evacuation orders⁷⁹⁶; Sommario mentions also the freedom from compulsory labor that could be limited to force individuals to take part in some early post-disaster necessary tasks, like the organization of evacuation centers⁷⁹⁷. However, the legitimacy of such limitation, justified by the necessity to protect a collective interest, in the case of nuclear accidents, when some tasks might imply an additional risk of radiation exposure, must be balanced against the risk of impacting the individuals' right to life which is an absolute human right. Finally, also the freedom of expression could be limited in order to avoid panic generated by fake news; yet, to the extent that the freedom of expression "shall include freedom to seek, receive and impart information and ideas of all kinds" as Article 19(2) of the ICCPR states, its restriction in situations of radioactive emergencies must be very careful: the justification of not creating panic does not have to lead to the concealment of fundamental information on the contamination levels, so it does not have to impact the right to receive essential information⁷⁹⁸; plus, the limitation of the freedom of expression and in particular to seek information can be very dangerous in cases in which public authorities, for different reasons, tend to gloss over the reality of the situation, like in the case of the Fukushima accident when clear information on the actual degree and dangerousness of environmental and food contamination were not provided⁷⁹⁹; in this case, even though the access to information from non-public official channels can create panic, on the other hand, it can be vital. Linked to this, especially in the case of nuclear emergencies or accidents, the limitation of the freedom of expression can even lead to a clash between the need to maintain public order and the protection of public health: on the one hand, the restriction of the flow of information can avoid panic and disorders, but, on the other hand, the insufficiency of information can cause the undertaking of actions that are dangerous for

⁷⁹⁶ See CESCR (1991). CESCR General Comment No.4: the Right to Adequate Housing (Art.11 (1) of the Covenant), and CESCR. (1997). The Right to adequate housing (Art.11.1): forced evictions.

⁷⁹⁷ Ibid. p. 325.

⁷⁹⁸ See Article 19. (2015). *The Public's Right to Know – Principles on Right to Information Legislation*. Available at: https://www.article19.org/data/files/RTI_Principles_Updated_EN.pdf (accessed: 8 may 2021).

⁷⁹⁹ See Sturmer J., Asada Y. (2019). *Fukushima's mothers became radiation experts to protect their children after nuclear meltdown*. Available at: <https://www.abc.net.au/news/2019-05-12/fukushima-mums-teach-themselves-how-to-be-radiation-experts/11082520> (accessed: 21 March 2021).

one's health⁸⁰⁰. Therefore, its reasonableness and proportionality must be carefully assessed, especially in circumstances similar to Fukushima because if the limitation of the freedom of expression results in the lack of fundamental information, the measure is clearly unreasonable, disproportionate and illegitimate to the extent that it goes against the protection of public health that can even amount to violations of the right to life⁸⁰¹, thus opening the issue of state responsibility.

Nevertheless, the extreme seriousness of a situation can also lead to derogations to human rights. If limitations are legitimate temporary constraints to the full enjoyment of human rights dictated by the circumstances of the case, a derogation is a suspension of the respect and protection of a human right. The important thing to note is that "[t]he use of 'exoneration clauses' exonerates the State invoking them from international responsibility for failing to fully respect its treaty obligations, provided that certain substantial and procedural rules are complied with in the exercise of this prerogatives"⁸⁰².

Now, the fundamental question is when derogations from human rights treaties can be invoked and if nuclear accidents fall in the range of possible situations. Always using the ICCPR as a point of reference for its international character (though regional treaty contain very similar provisions, so that the reasoning that will follow can be similarly applied to them), Article 4 states that

[i]n time of public emergency which threatens the life of the nation and the existence of which is officially proclaimed, the States Parties to the present Covenant may take measures derogating from their obligations under the present Covenant to the extent strictly required by the exigencies of the situation, provided that such measures are not inconsistent with their other obligations under international law and do not involve discrimination solely on the ground of race, colour, sex, language, religion or social origin⁸⁰³.

⁸⁰⁰ E.g. people that are not informed about the levels of radioactive contamination of the soil might keep consuming home-produced foodstuff that are highly contaminated, or, as it happened in the case of the Fukushima accident affected people might evacuate in the same direction as the radioactive plume; see Sasakawa Peace Foundation. (2012). *The Fukushima nuclear accident and crisis management - Lessons for Japan-U.S. Alliance Cooperation*. Akasaka: The Sasakawa Peace Foundation.

⁸⁰¹ This occurs when the concealment of information results in the exposure to additional undue doses of radiations that increase the risk of developing illnesses. See Evangeliou N, at al. (2013). 'Global and local cancer risks after the Fukushima Nuclear Power Plant accident as seen from Chernobyl: A modeling study for radiocaesium (¹³⁴Cs & ¹³⁷Cs)', in *Environment International*, Vol.64, pp.17-27.

⁸⁰² *Ibid.* p.327.

⁸⁰³ International Covenant on Civil and Political Rights, Article 4.

So, in order to derogate from the ICCPR three main requirements must be present: first, a public emergency which threatens the life of the nation; second, an official proclamation of the state of emergency; and third, the derogations must be “strictly required by the exigencies of the situation”⁸⁰⁴. Regarding the interpretation of Article 4 and these three requirements, one of the most authoritative elucidation was provided by the American Association for the International Commission of Jurists in the Siracusa Principles on the Limitation and Derogation Provisions in the International Covenant on Civil and Political Rights. The first and third requirement necessitate further explanations. According to the Siracusa Principles, a public emergency refers to the presence of “an exceptional and actual or imminent danger”⁸⁰⁵ and for the public emergency to threaten the life of the nation it has to “(a) [affect] the whole of the population and either the whole or part of the territory of the state; and (b) [threaten, *inter alia*,] the physical integrity of the population”⁸⁰⁶. However, Sommario argues that the requirement that the whole population is affected has been loosened and today it is sufficient that the whole population of an area is negatively affected⁸⁰⁷. Accordingly, following this last broader interpretation, nuclear accidents and nuclear emergencies (since the threat can also be imminent and not actual) completely fall under the range of situations that amount to a “public emergency which threatens the life of the nation”⁸⁰⁸.

Concerning the third requirement, it refers to the fact that derogations can only be invoked and applied when normal limitations and measures are insufficient to deal with the emergency, so they must be intended as a last resort⁸⁰⁹; if the public emergency which threatens the life of the nation can be adequately addressed through “ordinary measures permissible under the specific limitations clauses of the Covenant”⁸¹⁰, then derogations cannot be invoked because not strictly required. Now, even though the specific consequences caused by a nuclear accident or emergency depend on a set of variables, from its severity, to the means available to the affected country to promptly face and minimize them, and the geographic location (e.g. an accident that happen in a remote region in contrast with an accident that is relatively close to urban areas), the Human Rights Committee, in

⁸⁰⁴ Ibid.

⁸⁰⁵ American Association for the International Commission of Jurists (1985). *Siracusa Principles on the Limitation and Derogation Provisions in the International Covenant on Civil and Political Rights*, p. 10, para.39.

⁸⁰⁶ Ibid. para. 39(a)(b).

⁸⁰⁷ Sommario E. (2012). ‘Derogation from Human Rights Treaties in Situations of Natural or Man-Made Disasters’ in de Guttery et al. (eds.) *International Disaster Response Law*. 1st edn. The Hague: T.M.C. Asser Press, pp. 331-335

⁸⁰⁸ American Association for the International Commission of Jurists (1985). *Siracusa Principles on the Limitation and Derogation Provisions in the International Covenant on Civil and Political Rights*

⁸⁰⁹ Sommario E. (2012). ‘Derogation from Human Rights Treaties in Situations of Natural or Man-Made Disasters’ in de Guttery et al. (eds.) *International Disaster Response Law*. 1st edn. The Hague: T.M.C. Asser Press, p. 333.

⁸¹⁰ American Association for the International Commission of Jurists (1985). *Siracusa Principles on the Limitation and Derogation Provisions in the International Covenant on Civil and Political Rights*, p. 12, para. 53.

the General Comment No.29 on the derogations during a State of Emergency argued that “the possibility of restricting certain Covenant rights under the terms of, for instance, freedom of movement (art. 12) or freedom of assembly (art. 21) is generally sufficient during such situations [i.e. a natural catastrophe or a major industrial accident] and no derogation from the provisions in question would be justified by the exigencies of the situation”⁸¹¹. So, according to the Human Rights Committee, the consequences created even by major industrial accidents can generally be adequately tackled through the adoption of simple limitations instead of resorting to an outright suspension of human rights to the extent that they are not “strictly required by the exigencies of the situation”.

This consideration by the Human Rights Committee perfectly apply in the case of nuclear accidents; indeed, even though there is no doubt that nuclear accidents amount to public emergencies because they fundamentally threaten the physical integrity of the population, if compared to other public emergencies, they generally do not lead to “[the threatening] of the political independence or the territorial integrity of the state or the existence or basic functioning of institutions indispensable to ensure and protect the rights recognized in the Covenant”⁸¹². Therefore, no matter how catastrophic is the release of radioactive materials, nuclear accidents are somehow invisible catastrophe that do not materially impact the organizational and institutional capacity of the state to ensure at least a minimum protection, respect and fulfillment of human rights. In other words, to the extent that it is reasonable to claim that nuclear accidents generally do not pose a threat to “the existence or basic functioning of institutions indispensable to ensure and protect the rights recognized in the Covenant”, the consequences of a nuclear accident, regardless of how catastrophic they are, can be addressed through normal limitations of, for instance, the freedom of expression, the right to peaceful assembly, the right to public participation, the freedom of movement and freedom to choose one’s residence.

In addition, always regarding the expression “strictly required by the exigencies of the situation”⁸¹³, the whole discussion held in chapter 1 on IDRL can be considered relevant, especially if we go towards the consolidation of the duty to seek and request assistance on the part of the affected State. As a matter of fact, in the aftermath of a disaster, the single State can find itself in the situation of not being able to respect and protect human rights, so derogations are “strictly required by the

⁸¹¹ Human Rights Committee (2001). CCPR General Comment No.29: Article 4: Derogations during a State of Emergency”, CCPR/C/21/Rev.1/Add.11, para.5.

⁸¹² American Association for the International Commission of Jurists (1985). Siracusa Principles on the Limitation and Derogation Provisions in the International Covenant on Civil and Political Rights, p.10 para. 39(b).

⁸¹³ International Covenant on Civil and Political Rights, Article 4.

exigencies of the situation”⁸¹⁴ to cope with the crisis; nevertheless, they could no longer be strictly required if international assistance is promptly sought and requested. It follows that, if the duty to seek and request assistance acquire the status of customary law, the possibility to lawfully resort to derogations from human rights treaties is supposed to be radically reduced.

Up to now, the analysis focused on civil and political rights, as enshrined especially in the ICCPR; but, what about economic, social and cultural rights that are equally, if not more clearly, jeopardized in case of disasters? Regarding limitations, the ICESCR, in Article 4 provides that “[t]he States Parties to the present Covenant recognize that [...] the State may subject such rights only to such limitations as are determined by law only in so far as this may be compatible with the nature of these rights and solely for the purpose of promoting the general welfare in a democratic society”⁸¹⁵. In the case of radioactive contamination, there are several rights that can be legitimately limited for the purpose of protecting the population and promote its welfare, for example the limitation to the consumption of certain food, and tap water; of course, in case of accidents occurring especially in countries characterized by a subsistence economy where the majority of people consume what is produced by themselves or locally, these limitations must be accompanied by measures to supply safe food and water, which is part of the requirement of compatibility with the very nature of the right; in this case, there is sort of paradox because there is somehow the *obligation* to impose limitations, as the failure to apply limitations to consumption can amount to a violation of the right to health and life. But also the right to education can be temporarily limited because of the risk of radioactive exposure.

Regarding derogations, the ICESCR, and other international conventions that include economic, social and cultural rights like the Convention on the Elimination of all Forms of Discrimination against Women and the Convention on the Rights of the Child do not contain clauses referring to the possibility of invoking derogations⁸¹⁶. The issue of possible derogations of economic, social and cultural rights can be considered as even more delicate than that concerning civil and political rights because economic, social and cultural are the rights that in case of emergencies are more difficult to be protected, respect and fulfilled as they require the availability of material and economic resources, but at the same time they are those which have the most immediate impact on the material life of affected people; we just need to think about the right to food and water, the right

⁸¹⁴ Ibid.

⁸¹⁵ Ibid.

⁸¹⁶ Sommaro E. (2012). ‘Derogation from Human Rights Treaties in Situations of Natural or Man-Made Disasters’ in de Guttry et al. (eds.) *International Disaster Response Law*. 1st edn. The Hague: T.M.C. Asser Press, p. 343.

to adequate housing, and the right to health. As a matter of fact, Alston and Quinn, quoted in Sommaro argue that one of the reasons for which a derogation clause was not introduced in the ICESCR might be that “the nature of the right contained in the Covenant and the fact that the case for derogation in times of emergency from, for example, the right to food and to health care would seem inherently less compelling than the case for derogation for the right to peaceful assembly or the right to vote”⁸¹⁷.

However, the issue of whether or not it is possible to derogate from the abovementioned human right treaties is still debated. In this regard, Sommaro states that “[t]he question of whether these instruments can be suspended in emergency situations represents a legal conundrum involving complex issues of State responsibility, treaty law and the nature of the obligations they impose on State parties”⁸¹⁸. Especially resorting to treaty law as codified in the Vienna Convention on the Law of the Treaties, it has been concluded that, if no derogation clauses are present in the text of the treaty, the *pacta sunt servanda* principle must be respected and all provisions of the treaty must be performed by the contracting parties in good faith⁸¹⁹. However, both the law of the treaties and the law on State responsibility contemplate the possibility to resort to necessity or *force majeure* as grounds, in the first case, to suspend the operation of the treaty or some provisions contained therein⁸²⁰, and in the second case, as circumstances precluding wrongfulness, namely as legitimate justifications for the failure to comply with treaty provisions⁸²¹. Thus, it seems that even though explicit provisions on the possibility to apply derogations are missing, derogations are allowed through the application of general international law principles. This said, even though the resort to necessity or *force majeure* is theoretically allowed, it has been recognized that there is a fundamental core that cannot be touched, namely there are some aspects that are non-derogable, that in no way and in no circumstance can be disregarded⁸²².

The CESCR has extensively dealt with the issue of what the core minimum obligations are in its general comments on the different rights enshrined in the Covenant. Yet, the presence of high radioactive contamination in the aftermath of a nuclear accident opens up a fundamental question: to what extent is it possible, for example, to derogate from the right to health or the right to

⁸¹⁷ Sommaro E. (2012). ‘Derogation from Human Rights Treaties in Situations of Natural or Man-Made Disasters’ in de Guttry et al. (eds.) *International Disaster Response Law*. 1st edn. The Hague: T.M.C. Asser Press, p. 347.

⁸¹⁸ *Ibid.*, p.343.

⁸¹⁹ Vienna Convention on the Law of the Treaties, Article 26.

⁸²⁰ *Ibid.*, Articles 61-62.

⁸²¹ ILC (2001). Responsibility of States for Internationally Wrongful Acts, Articles 23-25.

⁸²² Sommaro E. (2012). ‘Derogation from Human Rights Treaties in Situations of Natural or Man-Made Disasters’ in de Guttry et al. (eds.) *International Disaster Response Law*. 1st edn. The Hague: T.M.C. Asser Press, p. 348.

adequate housing (the requirements of location and habitability must be recalled), even minimally and ensuring the respect of the core obligations, when the minimum relaxation of the obligations increases the possibility of radiation exposure that has an impact on the absolute right to life? It can be said that the specific circumstances of a nuclear accident lead to the opposite direction: not the derogation, but the strengthening of some rights. Indeed, even though a nuclear disaster can put the financial and economic resources of a States under pressure so as to push governmental authorities toward the application of derogations, in light of the ultimate goal to protect, respect and fulfill human rights, it is more reasonable that there is instead a channeling of resources, and also the request of international assistance, to ensure the full protection of those economic, social and cultural rights for which even the minimal step back from the maximum protection has the potential to jeopardize the enjoyment of the non-derogable right to life⁸²³.

In practical terms, linking what has just been said on limitations and derogations and the analysis of the violations that occurred in the context of the Chernobyl and Fukushima disaster, it can be said that Japan and the Soviet Union can be held internationally responsible for all the rights that have been the object of analysis: the right to life and the right not to be subject to inhuman or degrading treatment are absolute rights, so no limitations or derogations are applicable; the right to health was violated because even core obligations were not respected⁸²⁴; the right to housing was violated by Japanese authorities in the context of the lifting of evacuation orders because at that time the state of emergency no longer subsisted and the same is valid for the right to information and involvement in decision-making that took place before the accident and in the context of the post-emergency/recovery phase, including the issue of radioactive water discharge. On the other hand, other civil and political rights like the freedom of movement, freedom of expressions and hence forth cannot be alleged to have been violated because their non-full enjoyment was justified by the application of legitimate limitations on grounds of public order, health and security.

Moreover, in general terms, it must be noted that the resort to international justice on the part of individuals alleging the violation of human rights, after the exhaustion of domestic remedies, was quite limited especially in the case of Japanese people. Indeed, even though the Soviet Union, at the time of the Chernobyl accident had not ratified the Optional Protocol to the International

⁸²³ Further exposure to radiation can potentially cause the insurgence of diseases that interfere with the right of individuals “to be free from acts and omissions that [...] may be expected to cause their unnatural or premature death, as well as enjoying a life with dignity”; see Human Rights Committee (2018). General Comment No.36 (2018) on article 6 of the International Covenant on Civil and Political Rights, on the right to life – CCPR/C/GC/36.

⁸²⁴ See CESCR (2000). CESCR General Comment No. 14: The Right to the Highest Attainable Standard of Health (Art. 12).

Covenant on Civil and Political Rights (the Russian Federation did so in 1991) and Optional Protocol to the International Covenant on Economic, Social and Cultural Rights (still today not ratified by the Russian federation), it was part of the ECHR, so cases could be brought in front of the ECtHR; on the other hand, Japan has not ratified any of the two Optional Protocol yet and in the Asian continent there is no regional regime for the protection of human rights setting binding obligations and instituting an adjudicative body.

So, to conclude, nuclear States that adopt a conduct similar to that adopted by Japan and the Soviet Union (both in normal times by not acting with due diligence in order to prevent accidents, and in the aftermath of nuclear disasters) - apart from those case in which human rights are legitimately limited, and considering that derogations can hardly be invoked - can be held internationally responsible for violations of human rights as a consequence of their own action or inaction in addressing the consequences of the disasters, but also as a consequence of their failure to respect their obligation to protect the population from third parties activities, in the context of cases brought in front of relevant Courts or treaty-based bodies⁸²⁵ by individuals or States.

⁸²⁵ Depending on the geographical location of the accident and the treaty invoked, the relevant fora can be the European Court of Human Rights, the Inter-American Court of Human Rights, the African Court on Human and Peoples' Rights, the Human Rights Committee, and the Committee on Economic Social and Cultural Rights.

Chapter 5

Nuclear energy and climate change

1. Is nuclear energy an effective tool in the fight against climate change?

Climate change and its impact on global dynamics, earth and human systems is now clearly considered to be an existential threat. Accordingly, almost unanimous consensus has been reached on the fact that we need to act extremely quickly in order to attain the target indicated by the IPCC to contain the rise in global temperature within 1.5°C°. In this perspective, the energy sector plays a pivotal role since “[t]he production and use of energy currently account for around two thirds of total GHG emissions, and electricity generation in turn accounts for one third of these energy related emissions. Emissions from the electricity sector are growing rapidly and have more than tripled since 1970”⁸²⁶. So, the increase in energy demand, due in part also to the rise in world population but also to the needs of an increasingly demanding consumer society, place the necessity to undertake a massive and quick process of energy transition first in the list of priorities. In this regard it has been estimated that the energy production sector must completely be decarbonized, so turn into a zero emission sector, by 2050 in order to meet the 1.5°C target⁸²⁷, but anyway emissions must be abated heavily as soon as possible. Now, the key question is the following: can nuclear energy effectively help in this process of change to try to counter climate change?

In answering this question, the first thing that must be underlined is that the issue is very controversial and the literature is fraught with diverging or even opposite conclusions. Also analyzing the pronouncements of the IPCC on the matter, it is possible to grasp the complexity surrounding the question posed above. Indeed, the IAEA argues that “[m]any organizations are analyzing the decarbonization of the energy system, and many of their scenarios, including all four illustrative scenarios described by the IPCC in its 2018 Special Report on Global Warming of 1.5°C, call for a substantial increase in global nuclear power capacity”⁸²⁸; however, the same IPCC, quoted in Larsen, recognized that “[t]he political, economic, social and technical feasibility of solar energy, wind energy and electricity storage technologies has improved dramatically over the past few years, while that of nuclear energy and carbon dioxide capture and storage (CCS) in the electricity sector

⁸²⁶ IAEA. (September 2020). *Climate Change and Nuclear Power 2020*. Vienna: International Atomic Energy Agency, p.1.

⁸²⁷ Ibid.

⁸²⁸ Ibid., p.2.

have not shown similar improvements”⁸²⁹, and that “[b]arriers to and risks associated with an increasing use of nuclear energy include operational risks and the associated safety concerns, uranium mining risks, financial and regulatory risks, unresolved waste management issues, nuclear weapons proliferation concerns, and adverse public opinion”⁸³⁰. This complexity arise from the fact that it is not just a matter of reducing CO2 emissions that are the main cause of climate change, but to fight climate change in the much broader framework of promoting sustainability and sustainable development which is a concept that includes environmental, but also political and social concerns⁸³¹.

Despite the presence of many divergent visions, there is convincing evidence that massive investments on the nuclear energy sector are not the right solution to fight climate change, especially in a sustainable development perspective. Arguments in favor of this view put forward six main points: the carbon footprint of nuclear energy production, costs, time, risks for the environment, risks for the population, and security of the energy supply.

1.1. Is nuclear energy a source of clean energy?

Clean energy is defined as “energy gained from sources that do not release air pollutants”⁸³², or alternatively, as zero-emission energy sources. In order understand whether it is possible to categorize nuclear energy as a source of clean energy, it is indispensable to calculate its approximate lifetime carbon footprint. This is the point on which scientists and scholars’ calculations and studies diverge the most⁸³³. Divergencies in estimations about nuclear energy production carbon footprint can be exemplified by taking into account the position of the IPCC and that of Benjamin Sovacool, Professor of the University of Singapore. The IPCC, in the report “Climate Change 2014 – Mitigation of Climate Change”, considered nuclear energy as having a life cycle carbon footprint almost equivalent to that of renewable energy sources⁸³⁴, while Professor Sovacool is far less optimistic: in

⁸²⁹ Larsen T. (22nd August 2020). ‘Nuclear Energy Is Not a Climate Solution: Response to Gary S. Was and Todd R. Allen’, in *New Labor Forum*, Vol.29, No.3, p. 21.

⁸³⁰ *Ibid.*, p. 19.

⁸³¹ McIntyre O. (2006). ‘The role of customary rules and principles in environmental protection of shared international freshwater resources’, in *Natural Resources Journal*, Vol.46, No.1, pp. 157-210.

⁸³² TWI-global (n.d.) *What is clean energy? How does it work? Why is it so important?*. Available at: <https://www.twi-global.com/technical-knowledge/faqs/clean-energy#WhatDoesCleanEnergyMean> (accessed: 4 June 2021).

⁸³³ Barnham K. (5th February 2015). *False solution: Nuclear power is not 'low carbon'*, *Ecologist – the journal for the post-industrial age*. Available at: <https://theecologist.org/2015/feb/05/false-solution-nuclear-power-not-low-carbon> (accessed: 5 September 2021)

⁸³⁴ See, Rosen A. (2016). *Why Nuclear energy is not an answer to global warming*. Berlin: IPPNW Germany.

2008, he conducted a meta-analysis of more than one hundred studies on total CO₂ emissions during the whole nuclear fuel cycle and concluded that “nuclear power is responsible for about six times the carbon emissions of wind power, and 2-3 times the carbon emissions of various types of solar power technologies—and the renewables’ carbon footprint drops as the technology becomes more efficient”⁸³⁵, though emissions are still significantly lower than those produced by coal and fossil fuels.

An important thing to stress is that, in order to have an accurate idea of the real carbon impact of nuclear energy production, it is necessary to adopt a full-energy chain emissions – or life-cycle – approach. As Van De Vate describes it,

[i]n case of nuclear energy it [the energy chain] begins with its ‘cradle’, uranium mining, and ends with its ‘grave’, dismantling the nuclear power plant and storage of the nuclear waste. In between birth and death there is: ore handling; fuel fabrication (including enrichment in most cases) and transportation; power plant construction, operation and maintenance; possibly spent fuel reprocessing; and handling and storage of spent fuel or waste⁸³⁶.

All these activities are highly carbon-intensive. Therefore, if the single conversion/transformation phase is analyzed, it can be said that nuclear energy is almost a zero-emission energy source, but this analysis would be highly inaccurate because it overlooks the impact in terms of emissions of all those activities which are necessary to support the production of nuclear energy. It is also because of the failure to adopt a life cycle approach that studies report divergent data on the degree of “cleanness” of nuclear energy; however, to repeat, those which do not take into account the full-energy chain can be said to be inaccurate and too simplistic, reporting partial data. Despite this, strong divergencies remain also comparing studies based on the analysis of the entire life cycle. Differences arise because of the difficulty to estimate CO₂ emissions from waste disposal and dismantling since few reactors have been completely dismantled, so data are really based on predictions with almost no empirical verification. Plus, fuel fabrication also proves problematic to be assessed in terms of emissions because it depends on the uranium concentration in the ore⁸³⁷.

⁸³⁵ Mariotte M. (July 2014). *Nuclear Energy Is Dirty Energy (and does not fit into a “clean energy standard”)*, *Nuclear Information and Resource Service*. Available at: <https://www.nirs.org/wp-content/uploads/factsheets/nuclearenergyisdirtyenergy2014.pdf> (accessed: 8 June 2021).

⁸³⁶ Van de Vate J. F. (1996). *Full Energy Chain Analysis of Greenhouse Gas Emissions from Different Energy Sources*. Vienna: IAEA.

⁸³⁷ Barnham K. (5th February 2015). *False solution: Nuclear power is not 'low carbon'*, *Ecologist – the journal for the post-industrial age*. Available at: <https://theecologist.org/2015/feb/05/false-solution-nuclear-power-not-low-carbon> (accessed: 5 September 2021).

In this regard, Rosen argues that, as time passes, the life-cycle CO₂ emissions for the production of nuclear energy are supposed to rise due to the decrease in high-density uranium ores, a situation that will require increasingly carbon-intensive techniques for the extraction of uranium from the ground where the concentration is low⁸³⁸. It is relevant to underline that the aforementioned problematic phases (fuel fabrication, disposal of nuclear waste, dismantling) are not present, or anyway have minor significance, in the case of energy production from renewable sources. As a consequence, the estimation and analysis of the carbon footprint of renewable energy sources is considerably more accurate and certain than that of nuclear energy production⁸³⁹. Finally, it must be acknowledged that, even if nuclear energy may be categorized as a low-carbon energy source if compared to coal and fossil fuels, CO₂ is not the only polluting substance whose emission has to be taken into account: both during normal operation and especially in case of accidents, NPP release other toxic substances (radionuclides) into the atmosphere and water which are cancerous and impact the environment negatively, thus impairing those natural dynamics that help curbing climate change⁸⁴⁰ and going against the definition of sustainable development already analyzed in the previous chapters.

1.2. Nuclear energy and the urgency to act.

The second factor to consider when assessing the potential of nuclear energy in the fight against climate change is time. Basically all Conferences of the Parties (COPs) stressed the need to act urgently and this urgency was then reflected in the words contained in the Paris Agreement⁸⁴¹. Unfortunately, nuclear energy hardly fits this imperative to take action and reduce CO₂ emissions as soon as possible.

The planning-to-operation period of the totality of NPPs that have been built has been between 10 and 19 years, but some facilities took even longer to enter into operation⁸⁴². This is due to the fact

⁸³⁸ Rosen A. (2016). *Why Nuclear energy is not an answer to global warming*. Berlin: IPPNW Germany.

⁸³⁹ Barnham K. (5th February 2015). *False solution: Nuclear power is not 'low carbon'*, Ecologist – the journal for the post-industrial age. Available at: <https://theecologist.org/2015/feb/05/false-solution-nuclear-power-not-low-carbon> (accessed: 5 September 2021).

⁸⁴⁰ A simple example might be the need to clear-cut the contaminated areas in the aftermath of a nuclear accident but trees are carbon sinks, namely they take CO₂ out of the atmosphere, so that they are fundamental in the fight against climate change.

⁸⁴¹ Article 4 in particular states that “[i]n order to achieve the long-term temperature goal set out in Article 2, Parties aim to reach global peaking of greenhouse gas emissions as soon as possible [...] and to undertake rapid reductions thereafter”.

⁸⁴² Bezanson D. (2019). *7 Reasons... Nuclear power and climate change*, Sierra Club Grassroots Network. Available at: <https://content.sierraclub.org/grassrootsnetwork/team-news/2019/06/7-reasons-nuclear-power-and-climate-change> (accessed: 6 September 2021)

that not only are NPPs huge and complex facilities that require long construction times, but they also need a considerable number of construction and operating permits. To this, it is necessary to add the setbacks that can arise from the lack of adequate funding that is a non-negligible problem since NPPs construction is extremely expensive, and the degree of political and especially public acceptance⁸⁴³: on-site public manifestations and protests are among the most important factors that can stretch the planning-to-operation times.

These long planning-to-operation times acquire particular significance in light of the process of climate inertia. Climate inertia is a process by which even if CO₂ emissions are eliminated completely now, it will take time for the concentration of CO₂ in the atmosphere to start decreasing and even more time is necessary for the climate system to respond to decline in CO₂ concentration⁸⁴⁴; in more practical terms, this means that “[a]fter stabilization of the atmospheric concentration of CO₂ and other greenhouse gases, surface air temperature is projected to continue to rise by a few tenths of a degree per century for a century or more, while sea level is projected to continue to rise for many centuries”⁸⁴⁵. Hence, the more we postpone the time in which CO₂ will be cut considerably, the longer it will take and the more difficult it will be to establish a new and safer climate equilibrium. Having said that, it is clear that if a State rely on nuclear energy for its energy transition, it means that emissions in the energy sector will be cut in two decades hopefully, and in the meanwhile CO₂ keeps concentrating in the atmosphere, making the necessary reduction of CO₂ emissions to contain the temperature rise to 1.5-2 C° riskier, more expensive and difficult. On the other hand, wind and solar energy projects only take from two to five years to be completed⁸⁴⁶, thus allowing to reduce emissions much sooner, in line with the call to prompt action set out in the Paris Agreement. For this reason, Rosen claims that “[w]ith very long lead times for construction of new nuclear power plants, they do not pose a useful remedy for the very acute problems of global warming”⁸⁴⁷.

1.3. Costs linked to the production of nuclear energy.

⁸⁴³ IAEA. (September 2020). *Climate Change and Nuclear Power 2020*. Vienna: International Atomic Energy Agency, p. 7.

⁸⁴⁴ Verheggen B. (11th August 2016). *Climate inertia*, Skeptical science. Available at: <https://www.skepticalscience.com/climate-inertia.html> (accessed: 12 June 2021).

⁸⁴⁵ IPCC. (2001). *Climate Change 2001: Synthesis Report*, Intergovernmental Panel on Climate Change. Available at: <https://archive.ipcc.ch/ipccreports/tar/vol4/011.htm> (accessed: 13 June 2021).

⁸⁴⁶ Bezanson D. (2019). *7 Reasons... Nuclear power and climate change*, Sierra Club Grassroots Network. Available at: <https://content.sierraclub.org/grassrootsnetwork/team-news/2019/06/7-reasons-nuclear-power-and-climate-change>. (accessed: 6 September 2021)

⁸⁴⁷ Rosen A. (2016). *Why Nuclear energy is not an answer to global warming*. Berlin: IPPNW Germany, p.6.

The third main shortcoming related to the possibility that nuclear energy constitutes an effective tool to address the problem of climate change is linked to costs. Indeed, the construction of extremely complex nuclear facilities, the management of related activities like waste disposal or uranium supply, and the maintenance of safety standards are extraordinarily costly⁸⁴⁸.

The IAEA in its report “Climate Change and Nuclear Power 2020” stated what follows:

[s]everal countries have signalled their plans to utilize nuclear power in their first nationally determined contributions under the Paris Agreement. However, these plans are not sufficient to meet the goal of limiting the increase in average global temperature to well below 2°C or 1.5°C. Countries will need to commit to more ambitious action in their updated 2020 and future nationally determined contributions [...]. The 30 countries using nuclear power today have the capacity, in terms of infrastructure and experience, to ramp up nuclear power on a scale that could make a significant difference to global emissions. Over the medium term, the adoption of nuclear power by additional countries, particularly emerging economies that will drive a greater share of future emissions growth, can support broader climate mitigation action⁸⁴⁹.

This excerpt basically takes for granted States capacity to undertake ambitious nuclear projects, but it overlooks the problem of costs that is striking affluent States and it is even more problematic considering the possibility for developing countries to rely on nuclear energy for their energy transition processes and emission cuts, since they have lower financial capabilities. In this regard, Larsen mentions the situation in the US, noting that the construction of two nuclear facilities in South Carolina was abandoned due to a surge in costs, while other two plants in Georgia are still in course of construction but construction times are stretching considerably (approximately 5 more years than expected are required for completion) and costs are skyrocketing (from \$14 billion to more than \$28 billion)⁸⁵⁰. Delays and higher costs affect not only the US but also several other NPPs under construction in France, Finland and UK, where in the first two cases projects were managed by the same French company that because of the increase in costs declared bankruptcy and could

⁸⁴⁸ Carrington D. (2019) *Nuclear power can be green but at a price*, The Guardian. Available at: <https://www.theguardian.com/environment/2019/jan/17/nuclear-power-can-be-green-but-at-a-price-hitachi-toshiba-wylfa> (accessed: 15 June 2021).

⁸⁴⁹ IAEA. (September 2020). *Climate Change and Nuclear Power 2020*. Vienna: International Atomic Energy Agency, p.3.

⁸⁵⁰ Larsen T. (22nd August 2020). ‘Nuclear Energy Is Not a Climate Solution: Response to Gary S. Was and Todd R. Allen’, in *New Labor Forum*, Vol.29, No.3, p. 20.

be saved only thanks to the intervention of the French State⁸⁵¹. Now, if construction costs are problematic to be sustained by affluent countries, it is evident that the hope expressed by IAEA that emerging countries can adopt nuclear power to support their climate mitigation actions is hardly realistic, also considering that NPPs then have to be managed and run. Moreover, Larsen points out that “construction of nuclear power plants today costs 60 percent more than earlier generations of reactors, at a time when the cost of wind and solar technologies is rapidly declining”⁸⁵².

In addition, costs are expected to increase also for the maintenance of NPPs, as safety standards are becoming increasingly strict, and for the obtention of uranium. Indeed, Rosen underlines that “[t]he front-end costs for the mining and production of uranium are kept low by criminally negligent safety and health standards in uranium mines and human rights abuses towards indigenous communities”⁸⁵³, so the right application of more stringent labor and environmental standards aimed at strengthening the respect and protection of human rights might cause an increase in costs. Many supporters of nuclear energy now mention the potential of a new generation of reactors, called Small Modular Reactors, that might be less costly and also faster to be built. However, no small modular reactor is currently operative and they will not for at least ten years because of the need to check rigorously their safety⁸⁵⁴. This is an important shortcoming that brings us back to issue of time: climate change and global warming require a strong reduction in greenhouse gas emissions now. However, because of extremely high costs “the nuclear industry does not have the capacity to *rapidly* expand production”⁸⁵⁵, so that to increase its share of world energy production far beyond today’s modest 10.8%⁸⁵⁶ and be considered a valuable weapon against climate change.

1.4. Security of energy supply, risks for the environment and risks for the population.

The last three factors to examine in the discussion about the importance of nuclear energy in the fight against climate change are more linked to the need to consider climate change in the broader

⁸⁵¹ Rosen A. (2016). *Why Nuclear energy is not an answer to global warming*. Berlin: IPPNW Germany.

⁸⁵² Larsen T. (22nd August 2020). ‘Nuclear Energy Is Not a Climate Solution: Response to Gary S. Was and Todd R. Allen’, in *New Labor Forum*, Vol.29, No.3, p. 21.

⁸⁵³ Rosen A. (2016). *Why Nuclear energy is not an answer to global warming*. Berlin: IPPNW Germany, p.6.

⁸⁵⁴ Carrington D. (2019). *Nuclear power can be green but at a price*, The Guardian. Available at: <https://www.theguardian.com/environment/2019/jan/17/nuclear-power-can-be-green-but-at-a-price-hitachi-toshiba-wylfa> (accessed: 15 June 2021)

⁸⁵⁵ Rosen A. (2016). *Why Nuclear energy is not an answer to global warming*. Berlin: IPPNW Germany.

⁸⁵⁶ Réseau Action Climat – France. (August 2015). *Nuclear Power: A False Solution To Climate Change*, Réseau Sortir du nucléaire. Available at: https://www.sortirdunucleaire.org/IMG/pdf/rac-2015-nuclear_power-a_false_solution_to_climate_change.pdf (accessed: 10 April 2021)

framework of sustainability and sustainable development. Therefore, prompt action must be taken to counter climate change but action must encompass a human and social dimension. In this regard, among the different Sustainable Development Goals, the goal No.7 deals with “[ensuring] access to affordable, reliable, sustainable and modern energy for all”⁸⁵⁷. There are two key words: reliable and sustainable.

Concerning energy reliability, it refers to the security of supply, so the fact that *all* people can have access to energy on a continuous basis. Nuclear facilities are extremely complex structures endowed with sophisticated safety mechanism, so that when technical problems arise reactors shut down in order to avoid accidents. However, shutdowns can last for a long time, a time in which electricity is not produced. In addition, NPPs require incredible quantities of water for the cooling system, something that becomes problematic in periods of serious droughts⁸⁵⁸ and they are really susceptible to heat waves and extreme weather events that are more and more frequent. Réseau Action Climate-France noted that

[...] such climatic events can disrupt the operation of nuclear power plants: one quarter of France’s nuclear reactors had to be shut down or operated at reduced capacity in the hot summer of 2003. Fires caused by drought can also threaten nuclear installations, as happened at Mayak in Russia (2010) and at Los Alamos in the US (2011). In France, during the storm of 1999, the Blayais nuclear plant near Bordeaux was flooded and came very close to an accident. The electric grid can also be severely damaged. Even when shut down, a constant supply of electricity is required to cool down the reactors, so they will not undergo a nuclear meltdown⁸⁵⁹.

So, due to the increase in frequency of extreme weather events, NPPs are supposed to incur repeated shutdowns, thus qualifying as an unreliable energy source. Moreover, information reported by Réseau Action Climate-France are evidence of the fact that NPPs are unfit to face the consequences of climate change (droughts, storms, floods, heat waves and hence forth) that are

⁸⁵⁷ UNEP (n.d.). *GOAL 7: Affordable and clean energy*. Available at: <https://www.unep.org/explore-topics/sustainable-development-goals/why-do-sustainable-development-goals-matter/goal-7> (accessed: 20 June 2021).

⁸⁵⁸ Carrington D. (2019) *Nuclear power can be green but at a price*, The Guardian. Available at: <https://www.theguardian.com/environment/2019/jan/17/nuclear-power-can-be-green-but-at-a-price-hitachi-toshiba-wylfa> (accessed: 15 June 2021)

⁸⁵⁹ Réseau Action Climat – France. (August 2015). *Nuclear Power: A False Solution To Climate Change*, Réseau Sortir du nucléaire, p.3. Available at: https://www.sortirdunucleaire.org/IMG/pdf/rac-2015-nuclear_power-a_false_solution_to_climate_change.pdf (accessed: 10 April 2021)

even expected to worsen in the next decades, increasing the risk of accidents. This topic will be tackled more in depth in the next section.

The second key word identified before, that creates a link with the issue of the risks for the environment and risks for the population generated by nuclear energy production, is sustainable. In this work, the definition of sustainable development elaborated by the Brundtland Commission has been frequently mentioned, but there is another interesting definition that is worth being introduced that was formulated by John R. Ehrenfeld, Professor Emeritus of the Massachusetts Institute of technology: sustainability is “the possibility that human and other forms of life will flourish on the planet forever”⁸⁶⁰. Now, this possibility is jeopardized not only by the likelihood of nuclear accident (the likelihood of accidents is also thought to be increasing due to the aging of NPPs and collusion between operating companies and regulatory authorities that extend the operating life of facilities despite safety concerns⁸⁶¹), but also as a consequence of normal operations that affect all living beings, not only humans. Indeed, as just noted, NPPs require hundreds of thousands of gallons of water per minute to feed their cooling systems, exacerbating the problem of water supply in some parts of the world that terribly impact the life of many people; however, in addition to that, the so-called “once-through” systems to cool reactor cores down take in approximately 500,000 gallons of water every minute but this water is subsequently dumped at a temperature that is roughly 25 F° hotter than it was when pumped in⁸⁶², thus negatively affecting and damaging the marine ecosystems.

Problems arise also regarding the management of nuclear wastes that is still the source of animated debates. Especially in the case of underground storage sites, which might be more difficult to monitor in the long run and that can cause intervention challenges in case of accidents, radioactive leaks can contaminate groundwater - again exacerbating the problem of water shortage - and soil, thus impacting natural ecosystems, present and future generations of living beings⁸⁶³.

Finally, turning to a more anthropocentric view, the production of nuclear energy is a threat for human health, not only in case of accidents, as it has been extensively described in the previous

⁸⁶⁰ MITSloan Management Review. (2009). *Flourishing Forever - The author of Sustainability by Design: A Subversive Strategy for Transforming Our Consumer Culture says the current craze for going green is all wrong*. Available at: <https://sloanreview.mit.edu/article/flourishing-forever/> (accessed: 22 June 2021).

⁸⁶¹ Larsen T. (22nd August 2020). ‘Nuclear Energy Is Not a Climate Solution: Response to Gary S. Was and Todd R. Allen’, in *New Labor Forum*, Vol.29, No.3, p. 20.

⁸⁶² Public Citizens (n.d.). *Nuclear power is not clean or green!*. Available at: <https://www.citizen.org/article/nuclear-power-is-not-clean-or-green/> (accessed: 25 June 2021).

⁸⁶³ Rosen A. (2016). *Why Nuclear energy is not an answer to global warming*. Berlin: IPPNW Germany.

chapters, but also as a result of normal time operations. Public Citizens, reporting a study of the US Nuclear Regulatory Commission, states that

[it has been] calculated that collective radiation doses amounting to 12 cancer deaths can be expected for each 20-year term a reactor operates, as a result of radioactive emissions from the nuclear fuel cycle and routine reactor operations. This calculation assumes no unplanned accidents and does not consider radiation releases from high-level nuclear waste “disposal” activities. Nor are nonfatal health impacts related to radiation exposure counted in this tally⁸⁶⁴.

As already shown, the effects of radiations on human health but also on other living beings have been the object of a wide number of epidemiological studies. The key aspect that must be always borne in mind is that there is no safe threshold of radiation exposure: all doses of radiation can be potentially harmful. For this reason, it is imperative to limit radioactive exposure as much as possible. Of course, some sources of radiations cannot be eliminated, such as cosmic radiations, but other sources can be eliminated and, as Rosen assert, “[...] we should strive to avoid any unnecessary source of radiation exposure. The nuclear industry is such an avoidable source”⁸⁶⁵. All this said, it is clear that there are many aspects related to nuclear energy production that do not allow human and other forms of life to flourish, both in present times and, due to the long-lasting impacts of radiations, in the future.

However, the risks for the population and the environment are not limited to the release of radioactive particles during normal operations or in the event of accidents: nuclear energy production is also linked to the risk of terrorist attacks. In this sense, there is a double risk: first, NPPs can be the target for terrorist attacks with destructive and catastrophic consequences; second, with an expansion of the nuclear industry, there will be an increase in the circulation of nuclear materials and waste that can be diverted for terrorist purposes. These risks are not present with wind or solar energy that are also safer from the point of view of possible accidents or technical failures. In addition, the development of the nuclear industry opens up the debate on the barrier between the use of nuclear energy for civilian purposes and military ones: “any nation possessing

⁸⁶⁴ Public Citizens (n.d.). *Nuclear power is not clean or green!*. Available at: <https://www.citizen.org/article/nuclear-power-is-not-clean-or-green/> (accessed: 25 June 2021).

⁸⁶⁵ Rosen A. (2016). *Why Nuclear energy is not an answer to global warming*. Berlin: IPPNW Germany.

nuclear reactors can develop an atomic bomb...and use it”⁸⁶⁶. In this regard, several studies have recently demonstrated that even a limited nuclear war involving India and Pakistan is likely to cause disruptive global climate effects in the form of a plunge in agricultural output, and as a consequence on the availability of food, thus exacerbating the plague of food insecurity⁸⁶⁷. Therefore, not only cannot nuclear energy be considered as a valuable tool against climate change, but the development of the nuclear sector can also end up in a new hidden nuclear arms race where the possible use of these weapons is expected to have very serious climate consequences.

To conclude, nuclear energy is not the right solution to engage in an affective and rapid fight against climate change. Too much time and financial resources would be needed for the nuclear sector to develop sufficiently to lead to a significant reduction in CO₂ emissions, and anyway too many risks are associated to it. Plus, something that has not been pointed out specifically before, is that nuclear programs also require preparation, political organization, expertise, and specialized knowledge to be implemented safely, requirements that might be lacking in the majority of developing and less developed countries, as well as financial resources. For this reason, even though the IAEA pointed out that several countries indicated the importance of nuclear energy in their Intended Nationally Determined Contributions linked to the Paris Agreement, practically, just two countries in the world are planning to put new nuclear facilities into operation in the near future, namely Russia and China. In general, the nuclear industry has not increased its importance in terms of generated energy since the early 2000s and many countries are even planning to phase out nuclear energy production and invest in renewable energy source⁸⁶⁸, as Germany did. The feeling is that the organizations linked to nuclear energy production, or, more generally, stakeholders which might have vested interests in its development, are engaging in a process of “greenwashing”, namely they are presenting nuclear energy as greener than it actually is, and they eulogize its possible contribution in the fight against climate change, but the reality is different, as the inability of the industry to grow and expand demonstrates.

⁸⁶⁶ Réseau Action Climat – France. (August 2015). *Nuclear Power: A False Solution To Climate Change*, Réseau Sortir du nucléaire. Available at: https://www.sortirdunucleaire.org/IMG/pdf/rac-2015-nuclear_power-a_false_solution_to_climate_change.pdf, p. 4 (accessed: 10 April 2021).

⁸⁶⁷ Helfand I. (November 2013). *Nuclear Famine: two billion people at risk?* 2nd edn. IPPNW.

⁸⁶⁸ Carrington D. (2019) *Nuclear power can be green but at a price*, The Guardian. Available at: <https://www.theguardian.com/environment/2019/jan/17/nuclear-power-can-be-green-but-at-a-price-hitachi-toshiba-wylfa>. (accessed: 15 June 2021).

2. Compatibility of nuclear energy with states' commitments to fight climate change in connection with human rights: analysis of the issue starting from the reasoning in the Urgenda case.

In light of the arguments that have been exposed in the previous section which substantiate the idea that relying on nuclear energy to accomplish the energy transition is not useful to reduce CO₂ emissions as soon as possible, it is interesting to combine these findings with States' international commitments to fight climate change and protect human rights, in order to assess whether counting on nuclear energy actually goes against them. To do so, the reasoning adopted by the Dutch Courts in the groundbreaking Urgenda⁸⁶⁹ case will be used.

The Urgenda case opened a new era in the context of climate change litigation because, following Urgenda's claim that the Dutch State was not doing enough to do its part in the fight against climate change, for the first time national Courts ordered the State to do more in terms of emission reduction, so that the Dutch State was compelled to cut emissions by at least 25% by the end of the year 2020, if compared to the 1990 baseline⁸⁷⁰. This decision was reached by analyzing the content and meaning of Article 2 and 8 of the ECHR: failing to achieve an emissions reduction of at least 25% would jeopardize the life and wellbeing of all those living in the Netherlands as a consequence of climate change effects.

The proceeding started in 2015 when the District Court deemed Urgenda's claim admissible under the Dutch Constitution and concluded that, as just said, the Dutch State had to increase its efforts to combat climate change. The judgement was then confirmed by the Court of Appeal in 2018, and by the Supreme Court which ruled that the appeal of the Dutch State in cassation had to be rejected, so that the order of the Court of Appeal had to be considered as final⁸⁷¹. As well as marking the first time in which a national Court urged and ordered the state to take more effective and massive action against climate change, the case is groundbreaking also for the way in which the Courts reasoned: it analyzed the case in light of human rights protection, respect and fulfillment as the ECtHR would have done, and assessed the State commitment to address climate change providing a comprehensive examination of the results of the most important international conferences and scientific reports on the matter.

⁸⁶⁹ Urgenda is a Dutch Foundation which aims at promoting a more sustainable future, by paying attention, in particular, to the need to switching to a circular economy based on renewable energy in order to fight effectively climate change.

⁸⁷⁰ Climate case Urgenda. (2020). Available at: <https://www.urgenda.nl/wp-content/uploads/ENG-Dutch-Supreme-Court-Urgenda-v-Netherlands-20-12-2019.pdf> (accessed: 18 June 2021).

⁸⁷¹ Ibid., p. 2-3.

In revising the key findings about the functioning of the climate system, the effects of climate change and the targets that should be attained to contain its adverse impact, Dutch Courts recognized that “[t]he climate is slow to respond to the emission of greenhouse gases: the full warming effect of the greenhouse gases being emitted today will not be felt for another thirty to forty years”⁸⁷², which is basically the description of the phenomenon of climate inertia, and that “[w]hen viewed in light of the maximum concentration level of 430 or 450 ppm in the year 2100 [to keep the increase in global temperature below 1.5-2C°] and the current concentration level of greenhouse gases (401 ppm), it is clear that the world has very little leeway left when it comes to the emission of greenhouse gases”⁸⁷³. If temperatures increase by more than 2C°, considering the pre-industrial period as baseline, the world population is supposed to be subject to more and more extreme weather events and natural catastrophes. In order to be able to contain the CO₂ concentration and reach a maximum level of 450 ppm, the Intergovernmental Panel on Climate Change, in its fourth Assessment Report (AR4) published in 2004, which is at the core of the Urgenda judgement, estimated that “the emissions of greenhouse gases by the countries listed in Annex I to the UNFCCC [...] must be 25% to 40% lower in the year 2020 than they were in the year 1990”⁸⁷⁴. This target must be anyway read in conjunction with Article 4 of the Paris Agreement which urges States Parties to reach the peak of CO₂ emissions as soon as possible.

Now, in the Urgenda case, States obligations to cut CO₂ emissions as soon as possible are analyzed in light of the duty on the part of the States to respect the obligations set out in the ECHR. In particular, the pivotal question that is posed is the following: is the State in breach of Article 2 and Article 8 of the ECHR if it does not act at the maximum of its possibilities in fighting climate change? The Dutch Courts reiterated that Article 2 on the protection of the right to life, and Article 8 on the right to respect for private and family life entail positive obligations, so that “[i]f the government knows that there is a real and imminent threat, the State must take precautionary measures to prevent infringement as far as possible”⁸⁷⁵, where, according to the Supreme Court, the notion of imminence here does not refer to time, but to the fact that a danger is directly putting at risk the life of people, and the range of possible threats of course include environmental menaces⁸⁷⁶. Plus, the Supreme Court reiterated that the obligations set out in the ECHR must be interpreted according to the effectiveness principle and taking into account, *inter alia*, those “[...] elements of

⁸⁷² Ibid., p. 8, para 2.1.

⁸⁷³ Ibid.

⁸⁷⁴ Ibid.

⁸⁷⁵ Ibid., p. 13, para. 2.3.2.

⁸⁷⁶ Ibid., p. 20, paras. 5.2.2-5.2.3.

international law other than the Convention, the interpretation of such elements by competent organs, and the practice of European States reflecting their common values”⁸⁷⁷ and “[a]ccording to ECtHR case law, an interpretation and application of the ECHR must also take scientific insights and generally accepted standards into account”⁸⁷⁸, which include of course the reports issued by the IPCC.

As a consequence of the need to take into consideration the aforementioned tools and instruments, in interpreting the provisions of the ECHR in light of existing International Conventions on the issue of Climate Change, in particular the United Nations Framework Convention on Climate Change and the Paris Agreements, as well as considering the no-harm principle and the notion of partial responsibility as enshrined in the Draft Articles on Responsibility of States for Internationally Wrongful Acts, the Supreme Court affirmed that “Articles 2 and 8 ECHR relating to the risk of climate change should be interpreted in such a way that these provisions oblige the contracting states to do ‘their part’ to counter that danger”⁸⁷⁹; therefore, it is not important whether climate change is a global phenomenon: all States have to put all necessary efforts to counter it. Second, regarding the consideration of scientific insights and widely accepted standard in the interpretation of the ECHR, the Supreme Court had to consider whether the reduction of 25-40% indicated by the IPCC AR4, which *per se* in a non-binding document, for Annex 1 countries can be anyway considered as constituting an obligation for the States⁸⁸⁰.

Therefore, the Supreme Court posed itself two questions: the first referred to the degree of consensus around the 25-40% target of reduction; the second, referred to the possibility that the target can also be applicable to individual States belonging to the Annex 1 group⁸⁸¹. The Court recognized that the content of the AR4 was at the core of basically all COPs from 2007 onward (COP-13 held in Bali, COP-16 in Cancún, COP-17 in Durban, COP-18 in Doha, COP-19 in Warsaw, COP-20 in Lima and COP-21 in Paris)⁸⁸². Plus, AR4 was also at the basis of the formulation of the EU roadmap of emission reduction, the European Green Deal, which establishes the need to reduce GHG emissions by 30% by 2020, always considering 1990 as baseline. In addition, the Court noted that, after 2015, explicit reference to the AR4 targets of reduction was no longer made, and AR5 as well does not mention specific reduction percentages to be achieved by 2020. However, it is pointed out

⁸⁷⁷ Ibid., p. 21, para. 5.4.2.

⁸⁷⁸ Ibid., p. 21, para. 5.4.3.

⁸⁷⁹ Ibid., p. 25, para. 5.8.

⁸⁸⁰ Ibid., p. 27, para. 7.1.

⁸⁸¹ Ibid.

⁸⁸² Ibid., p. 27-28, paras. 7.2.1-7.2.3.

that this is not because the 25-40% cut had been replaced or removed, but simply because the 2020 deadline was too close in time to insist on specific targets that could not reasonably be attained, so that the focus shifted on subsequent periods⁸⁸³. For all the above, the Supreme Court concluded that “[t]here is a high degree of consensus in the international community on the need for in any case the Annex I countries to reduce greenhouse gas emissions by 25% to 40% by 2020”⁸⁸⁴, so that “[it] can be regarded as common ground within the meaning of the ECtHR case law [...], which according to that case law must be taken into account when interpreting and applying the ECHR”⁸⁸⁵. What is more is that there is even greater concern about the fact that this target could also not be enough, therefore, according to the Court, this should be a push for States to commit themselves to do more instead of less, applying the precautionary principle. However, what is important is that according to the Dutch Supreme Court, if a State does not reduce emissions by at least 25% from 1990 levels, it can be held in breach of article 2 and article 8 of the ECHR, also because, even though AR4 refers to annex 1 countries as a group, the UNFCCC, and especially the Paris Agreement that in its negotiations took directly into account the AR4 scenario, are grounded on the concept of States’ individual responsibility, therefore the reduction target applies also individually⁸⁸⁶. For this reason, the Supreme Court held that the Netherlands has to commit to reduce emissions by at least 25%, as provided by the AR4, thus confirming the order of the Court of Appeal.

In order to link what has been said so far about the reasoning applied in the Urgenda Case to the issue of nuclear energy, there is an important statement, always for the Urgenda judgement, that is worth being reported:

[a]ll greenhouse gas emissions lead to a reduction in the carbon budget still available [...]. Any postponement of the reduction of emissions therefore means that emissions in the future will have to be reduced on an increasingly large scale in order to make up for the postponement in terms of both of time and size. This means that, in principle, for each postponement of emissions reductions, the reduction measures to be taken at a later date will have to be increasingly far-reaching and costly in order to achieve the intended result, and it will also be riskier⁸⁸⁷.

⁸⁸³ Ibid., p. 29, para. 2.4.

⁸⁸⁴ Ibid., p. 30, para. 7.2.7.

⁸⁸⁵ Ibid., p. 30, para. 7.2.11.

⁸⁸⁶ Ibid., p. 31, para. 7.3.2.

⁸⁸⁷ Ibid., p. 32, para 7.4.3.

In the previous section, it has been shown how construction of nuclear power plants require a considerable amount of time: at least ten years. If countries rely on nuclear energy to accomplish their energy transition, this means that emissions from energy generation will start to go down in 10 years, hopefully. In the meanwhile, CO₂ will keep accumulating in the atmosphere thus exacerbating the problem of climate change, and making future mitigating actions more expensive, less certain in their effects, and much harder. Plus, the importance of data about the long construction times of nuclear facilities acquires even more significance if we consider two aspects. First, as stated above, energy production accounts for two thirds of total GHG emissions: if there will be an increasing push to turn to nuclear energy in order to cope with emissions and climate change, a striking share of global CO₂ emissions will not be reduced before 2030. Of course, this possibility takes for granted that huge investments are possible in order to considerably increase today's approximate 10% share of world energy generation occupied by nuclear energy⁸⁸⁸; second, it takes at least 10 years for a NPP to be completed, but during its construction a considerable amount of CO₂ is emitted. Concerning this, Public Citizens introduces the concept of energy recovery time, otherwise called Energy Payback Times, which ranges from 10 to 18 years for NPPs. This indicates that "[...] a nuclear power plant must operate for at least a decade before all the energy consumed to build and fuel the plant has been earned back and the power station begins to produce net energy"⁸⁸⁹. In contrast, the energy recovery time for wind power is roughly a year, while for solar power is three years or less⁸⁹⁰. Accordingly, for nuclear energy to start having a positive impact on CO₂ emissions, a minimum of two decades have to be waited.

The key point is that "[...] for each postponement of emissions reductions, the reduction measures to be taken at a later date will have to be increasingly far-reaching and costly in order to achieve the intended result, and it will also be riskier", so any decisions or actions that leads to a situation by which emissions are not reduced as soon as possible, but at a later date (when, instead, other technologies can equally reduce emissions but more promptly), cause an exacerbation of the

⁸⁸⁸ World Nuclear Association. (2021). *Nuclear Power in the World Today*. Available at: <https://www.world-nuclear.org/information-library/current-and-future-generation/nuclear-power-in-the-world-today.aspx> (accessed: 23 June 2021).

⁸⁸⁹ Public Citizens (n.d.). *Nuclear power is not clean or green!*. Available at: <https://www.citizen.org/article/nuclear-power-is-not-clean-or-green/> (accessed: 25 June 2021).

⁸⁹⁰ Ibid. However, the literature on the Energy Payback times for photovoltaics reports different data which takes into account the different technologies employed and the place where they are installed, since irradiation of course matters. (Vasilis, 2012) considering three different types of photovoltaics, points out that the maximum energy payback times are slightly more than a year and a half (1.7 yr), so even less than the data reported by (Public Citizens, n.d.). See Vasilis F. (2012). *How long does it take for photovoltaics to produce the energy used?* National Society of Professional Engineers. Available at: https://www.bnl.gov/pv/files/pdf/PE_Magazine_Fthenakis_2_10_12.pdf (accessed: 26 June 2021)

problem of climate change (also due to the presence of the aforementioned phenomenon of climate inertia) which, in turn, increasingly jeopardizes the enjoyment of fundamental human rights. Applying the reasoning put forward in the Urgenda Case to the emissions reduction period that expires in 2030 which is the one that concerns us today, what follows can be derived. As underlined above, there is almost unanimous consensus on the fact that we need to speed up the process of CO₂ abatement in order to limit the temperature increase to 1.5/2C°, and considering the specific timeframe ending in 2030, there is a rather strong *political*⁸⁹¹ consensus on reducing CO₂ emissions by approximately 50%, if compared to 1990 levels⁸⁹². Now, energy production account for the lion's share of GHG emissions, therefore, in order to meet the established abatement targets, huge efforts must be put in the process of energy transition. Yet, what if the energy transition process is grounded on the passage from fossil fuels to nuclear energy? This would mean that, according to what pointed out above about construction times and energy recovery time, net CO₂ emissions will not be reduced before two decades, in the best-case scenario. In turn, this signifies that, without the contribution from the energy sector, it is supposed to be very hard to meet the reduction targets set for the year 2030. In this context, climate litigations in front of national Courts, but possibly also in front of international human rights bodies when domestic remedies have been exhausted⁸⁹³, can be fundamental to urge States to do more in the fight against climate change, starting from the idea of States' duty to protect all those under their jurisdiction and ensure the protection, respect and fulfillment of fundamental human rights. It must be underlined, however, that Courts cannot create new laws, according to the principle of the separation of powers, therefore Courts have to limit themselves to order States to do their part in addressing climate change, without the power to

⁸⁹¹ The scientific community urges for stronger, more massive reductions to be sure to meet the 1.5C° target; the UNEP, back in 2019, issued a report in which it argued that if CO₂ emissions are not abated by a yearly 7.6% from 2020 to 2030, the 1.5C° temperature increase limit will be hardly met. See UNEP (2019). *Cut global emissions by 7.6% every year for the next decade to meet 1.5C° Paris target – UN report*. Available at: <https://www.unep.org/news-and-stories/press-release/cut-global-emissions-76-percent-every-year-next-decade-meet-15degc> (accessed: 28 June 2021).

⁸⁹² In April 2021, the EU has revised its target of emission reduction by 2030, pledging to reduce CO₂ emissions by at least 55%. See BBC (2021). *Climate Change: EU to cut CO₂ emissions by 55% by 2030*. Available at: <https://www.bbc.com/news/world-europe-56828383> (accessed: 29 June 2021). On the other hand, the US President Joe Biden, after its commitment to re-join the Paris Agreement, always in April 2021, announced a new reduction target of 50-52% but considering 2005 as a baseline for the cuts. See The White House (2021). *FACT SHEET: President Biden sets 2030 greenhouse gas pollution reduction target aimed at creating good-paying union jobs and securing U.S. leadership on clean energy technology*. Available at: <https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/22/fact-sheet-president-biden-sets-2030-greenhouse-gas-pollution-reduction-target-aimed-at-creating-good-paying-union-jobs-and-securing-u-s-leadership-on-clean-energy-technologies/> (accessed: 30 June 2021).

⁸⁹³ The weight and significance of climate change litigations is supposed to gain more and more importance especially when the (human) right to a healthy environment will achieve universal recognition and endorsement. Indeed, its recognition will open a new, more direct ground for litigation.

establish the precise way in which action must be taken⁸⁹⁴, but it is clear that if the share of CO2 from energy production, relying on nuclear energy, is not reduced enough to meet the necessary abatement targets because too much time is required to appreciate a positive impact, the only viable solution is to divert investments to renewable energy sources. Interestingly, in Italy, a group of more than 200 claimants and 24 associations, supported by a team of lawyers and professors, decided to bring a case, renamed *Giudizio Universale*, in front of an Italian Civil Court with the same aim of the Urgenda claim: push the State to do more in terms of emissions reduction to counter climate change, since climate change is jeopardizing the enjoyment of basic human rights that States are compelled to protect and respect⁸⁹⁵.

However, a final remark consists in noting that, as underlined above, investments are increasing much in the sector of renewable energy while the nuclear sector is lagging behind. This means that the great majority of States are relying on geothermal, hydroelectric, solar, wind, biomass, marine energy sources to undertake their energy transition processes, incentivized also by the technological improvements in these fields that allow investments also in those geographic areas where these technologies were once considered unfit. As a consequence, also due to the impact of the Fukushima accident, the nuclear energy sector is in decline because of high costs and perceived risks that cause skepticism and popular resistance. For this reason and all the above, nuclear energy can of course be kept in a country's energy mix, but it can hardly be the core of the energy transition.

3. Nuclear energy, climate change and gender: a negative relationship.

The production of nuclear energy and the working of nuclear power plants, the issue of climate change and the living conditions of women are three aspects that are negatively interconnected and interrelated: first, not only is not nuclear energy an answer to climate change, but nuclear power plants are also increasingly vulnerable to extreme weather events and gradual changes in the climate system; second, to the extent that nuclear power plants are heavily exposed to the risks caused by climate change, the likelihood of nuclear accidents is increasing and in the event of nuclear accidents, women are those who suffer the most, as the Fukushima case sadly testified; third, since the possibility of relying solely on nuclear energy will not help in reducing CO2 emissions

⁸⁹⁴ Climate case Urgenda. (2020). Available at: <https://www.urgenda.nl/wp-content/uploads/ENG-Dutch-Supreme-Court-Urgenda-v-Netherlands-20-12-2019.pdf>, pp. 34-36, para. 8 (accessed: 18 June 2021).

⁸⁹⁵ Giudizio Universale (n.d.). *La causa legale: facciamo causa allo stato*. Available at: <https://giudiziouniversale.eu/la-causa-legale/> (accessed: 30 June 2021).

from the energy sector in the near future, in the meanwhile the effects and impact of climate change are supposed to become harsher and harsher and women, especially those living in poor countries where the effects of climate change are even more severe, are one of the most vulnerable groups. The following sections are aimed at exploring these connections more in detail.

3.1. Nuclear power plants and their ability to withstand extreme weather events and gradual climate changes.

Many international organizations, experts and scientists, including the IAEA and the OECD-NEA, have acknowledged that Nuclear power plants will be increasingly subject to critical situations, much more than other energy-generating facilities, due to climate change-related events. Becker, Mátyás and Lorenz express a very harsh judgement because they claim that “[...]nuclear energy is highly unfit to withstand the effects of climate change, thus leading to increased nuclear risk rather than being part of supply security”⁸⁹⁶.

Nuclear power plants are highly susceptible to all major manifestations of climate change: heat waves and fires, sea level rise and floods, blizzards and ice storms, tropical cyclones, tornadoes and hurricanes, severe drought and hotter water temperatures. These are all climate phenomena whose frequency and/or intensity is increasing due to climate change and each of them make the likelihood of nuclear accidents higher⁸⁹⁷. Hence, climate change fundamentally threatens the safety of nuclear facilities, but how specifically? In order to answer this question, it is useful to mention the IAEA report titled “Adapting The Energy Sector To Climate Change” published in 2019. The report first acknowledges that NPPs are among the most technologically complex energy-generating facilities, due to the sophisticated systems that they require to function safely, including the cooling and ventilation systems, and the monitoring and control mechanisms, as well as the importance of their structural soundness. Among them, the cooling system is the one which is mostly subject to criticalities triggered by the effects of climate change, and unfortunately it is also one of the most

⁸⁹⁶ Becker O., Mátyás E., Lorenz P. (26th June 2020). *The impacts of climate change on nuclear risk and supply - security working paper*, Joint project – Nuclear Risk & Public Control. Available at: http://joint-project.org/upload/file/Joint_Project_Working_Paper_Climate_Change_Impacts_final.pdf, p.4 (accessed: 30 June 2021)

⁸⁹⁷ Glöcker O. (2010). *Effects of Extreme Weather Events on Nuclear Power Plants*, Joint ICTP-IAEA Workshop on Vulnerability of Energy Systems to Climate Change and Extreme Events. Available at: <http://indico.ictp.it/event/a09141/session/34/contribution/24/material/0/0.pdf> (accessed: 1 July 2021).

important, if not the most important, component which ensures the operations safety. The IAEA report provides a list of the climate change-induced problems that affect the cooling system:

[i]ce can block the cooling water intake system, reducing the flow of cooling water to unsafe levels. Hot weather can facilitate algae blooms or rampant growth in seaweed and other plant materials, which can also block cooling water intake. If cooling water is too hot because of high ambient temperatures, the cooling capacity can be diminished and safety jeopardized. If discharging used cooling water into a river or lake would raise the temperature above the limit allowed by heat pollution standards, a nuclear plant must reduce its operation level or shut down altogether until ambient temperatures decline. Long term droughts can lead to water rationing, which would limit water intake for cooling⁸⁹⁸.

So, heat waves and possible related droughts, that are increasing exponentially in recent years⁸⁹⁹, are among the most important threats for a safe and continuous functioning of NPPs. In this regard, Becker, Mátyás and Lorenz point out that 40% of European nuclear facilities have already been subject to repeated problems with the cooling system due to high temperatures⁹⁰⁰.

Regarding the effects of other extreme weather events on nuclear facilities, scientists raised the alarm about extreme storms caused, in particular, by cyclones, tornadoes and hurricanes, and associated huge waves that are thought to exceed in height and strength those which struck the Fukushima NPP, leading then to the accident⁹⁰¹. But more generally, extreme storms are dangerous because they can create damage to the building, to the tanks which contain the spent fuel, and to the cooling towers⁹⁰².

The third greatest threat for the safe functioning of NPPs is related to the impact of the sea-level rise and floods also considering that many facilities are built in coastal areas in order have easier access to water for the cooling systems. In this regard, the Fukushima accident is an example of the risks inundations and floods carry along, but more generally the accident opened up a new lively debate on NPPs resilience in the face of climate change. Becker, Mátyás and Lorenz argue that “[...] it revealed that there could be basic safety problems with the all operating units especially with the

⁸⁹⁸ IAEA. (September 2019). *Adapting The Energy Sector To Climate Change*. Vienna: IAEA, p. 39.

⁸⁹⁹ See e.g. Singer M. (2019). *Climate Change and Social Inequality*. New York: Routledge, pp.20-21.

⁹⁰⁰ Becker O., Mátyás E., Lorenz P. (26th June 2020). *The impacts of climate change on nuclear risk and supply - security working paper*, Joint project – Nuclear Risk & Public Control. Available at: http://joint-project.org/upload/file/Joint_Project_Working_Paper_Climate_Change_Impacts_final.pdf, p.33 (accessed: 30 June 2021)

⁹⁰¹ *Ibid.*, p.5.

⁹⁰² IAEA. (September 2019). *Adapting The Energy Sector To Climate Change*. Vienna: IAEA, p. 29.

older ones, whose design was prepared back in the sixties or seventies. Safety design of all operating plants is outdated and showing deficiencies [...]. Old reactor types [...] have several design weaknesses, which cannot be resolved by performing back-fitting measures”⁹⁰³.

Yet, the issue of back-fitting and adaptation measure leads us to consider another problem: how is it possible to clearly predict and quantify the impact of climate change on NPPs in order to update safety standards and devise accurately which measures have to be taken to make nuclear facilities more resilient? The problem is that, as the same IAEA remarks, “[n]uclear power plants are built to withstand EWEs on the basis of past experience, typically the worst expected event at the plant site over a 50 or 100 year period or much longer (e.g. 500 year floods). However, as climate changes, past events are becoming an increasingly inappropriate basis for the prediction of the severity of future events”⁹⁰⁴. The key point is that statistical methods and data series, based on past experiences, are no longer a trustworthy basis to develop and derive reliable predictions about future trends: the climate system is becoming too erratic, so we are in a situation in which scientists are unable to provide clear answers on how climate will change and related manifestations⁹⁰⁵. For example, as the same Becker, Mátyás and Lorenz point out, “[f]or flood protection sometimes safety factors are added which have only insufficient scientific validation. Taking this route is not recommended for nuclear energy, because the risk is too high in the case of under-dimensioning”⁹⁰⁶. Up to now, extreme weather events caused by climate change have only caused repeated shutdowns, but shutdowns cannot be the solution: first, if the reactor shuts down the energy production cycle is interrupted; second, shutting a reactor down during extreme weather events can lead to potentially dangerous and problematic situations. The IAEA, in the aforementioned report, simply claimed that it is necessary to “[adapt] plants so that reactor shutdowns become less frequent, [so that to] minimize outages as well as avoid costly plant related damages that would have occurred without plant adaptation”⁹⁰⁷. However, this statement seems oversimplistic: what about the costs of adapting nuclear facilities to the effects of climate change? And, in light of what

⁹⁰³ Becker O., Mátyás E., Lorenz P. (26th June 2020). *The impacts of climate change on nuclear risk and supply - security working paper*, Joint project – Nuclear Risk & Public Control. Available at: http://joint-project.org/upload/file/Joint_Project_Working_Paper_Climate_Change_Impacts_final.pdf, p.43 (accessed: 30 June 2021)

⁹⁰⁴ IAEA. (September 2019). *Adapting The Energy Sector To Climate Change*. Vienna: IAEA, p. 23.

⁹⁰⁵ Becker O., Mátyás E., Lorenz P. (26th June 2020). *‘The impacts of climate change on nuclear risk and supply’ security working paper*, Joint project – Nuclear Risk & Public Control. Available at: http://joint-project.org/upload/file/Joint_Project_Working_Paper_Climate_Change_Impacts_final.pdf, p. 6 (accessed: 30 June 2021)

⁹⁰⁶ Ibid., p.39.

⁹⁰⁷ IAEA. (September 2019). *Adapting The Energy Sector To Climate Change*. Vienna: IAEA, p. 24.

has just been said on the difficulties in predicting future climate trend, what long-term measures must be taken if scientific predictions are uncertain? In the second case, the application of the precautionary principle might dictate to adopt a worst-case scenario adaptation strategy but uncertainty remains.

Finally, there is a second way in which climate change impacts nuclear energy production, other than damage caused by extreme weather events: the productivity and efficiency of NPPs goes down as temperatures rise. Indeed, “[a]ccording to recent estimates, with every increase of 1°C in global mean temperature, nuclear plant generation output declines by 0.4–0.7% at low temperatures and by 2.3% at high temperatures”⁹⁰⁸. This is further evidence of how nuclear power is unfit both to sustain climate change and to counter it.

3.2. Unequal impact: how women suffer the consequences of nuclear accidents disproportionately.

Politicians, organizations and stakeholders involved in the nuclear sector, in order to assuage popular distrust towards nuclear energy, put forward arguments and statistics related to its absolute safety. However, the previous section has shown how nuclear facilities are supposed to become more and more vulnerable to the effects of climate change that will continue to worsen for decades even if we were able to cut almost all CO₂ emissions now, due to the often-mentioned climate inertia mechanism. To be more resilient, NPPs need to be upgraded and updated but adaptation requires time, thus leaving NPPs exposed to the dangers of climate change, and certainty that the measures taken are enough to sustain more and more extreme weather events, certainty that nowadays is lacking. This situation increases considerably the possibility that nuclear accidents can occur.

When disasters strike, women are among those who suffer the most. As well as physical factors that make women more vulnerable to the effects of radiations, an issue that has extensively been explored in the previous Chapter, is linked to the fact that emergency plans often do not consider the different needs women have, and their social condition. This is exactly what happened in the event of the Fukushima accident. Japan is a country that is geologically and geographically prone to disasters of different nature, whose intensity might increase as consequence of climate change, and it is also one of the most important nuclear States. For this reason, emergency plans should be as

⁹⁰⁸ Ibid., p. 25.

efficient as possible, and more effectively developed than in other parts of the world. Nevertheless, women's perspective has not been sufficiently and effectively incorporated in national disaster response plans and policies⁹⁰⁹. This is a consequence of the fact that past experiences of disasters were not used to collect women's experiences that could be the basis of a positive policy improvement⁹¹⁰. Again, this lack of consideration for the specific needs and situation of women had terrible consequences in the aftermath of the Fukushima nuclear disaster. Some of the most important consequences of the bad management of the immediate post-disaster response and the disproportionate impact they had on women have already been highlighted in the context of the analysis of human rights violations held in Chapter 4. However, there are some aspects of the post-Fukushima accident related to the situation of women that are worth being either recalled or newly introduced.

The first point to stress is that every disaster somehow magnifies pre-existing inequalities, situations of injustice and vulnerability, and women are often among the most socially vulnerable. In this regard, Ulrich points out that

Japan is a nation with a yawning gender gap. In 2012, women employed full-time only earned 69.3% of their male counterparts' wages. With part-time workers included, women only made 51.0% of the salaries of their male counterparts were paid. This enormous resource disparity meant that women were at a significant disadvantage for coping with the impacts of the disaster⁹¹¹.

In the aftermath of the nuclear accident, this situation, already characterized by great inequities, was further exacerbated by the fact that part-time jobs were the first to be cut as a consequence of the economic hardships that followed the accident. In addition, always Ulrich stresses that, when compensation was granted to those who lived in contaminated areas, "[p]ayments were made to married couples as a family unit – dispensed to the head of the household, which was usually the adult male. This meant that women's access to compensation funds was solely at the discretion of

⁹⁰⁹ Social Work Blog. (n.d.). *Participatory Investigation of the Great East Japan Disaster: PhotoVoice from Women Affected by the Calamity*, Social Work Blog – National Association of Social Workers. Available at: <http://www.socialworkblog.org/nasw-publications/2018/07/participatory-investigation-of-the-great-east-japan-disaster-photovoice-from-women-affected-by-the-calamity/> (accessed: 2 July 2021).

⁹¹⁰ Ibid.

⁹¹¹ Ulrich K. (2017). *Unequal Impact – Women's and Children's Human Rights Violations and the Fukushima Daiichi Nuclear Disaster*. Greenpeace Japan, p.5

their husbands”⁹¹². This is a consequence of the fact that the Japanese region struck by the disaster is characterized by very traditional gender roles⁹¹³ for which it is the man who takes care of the household’s finances. The economic precarity of married women and the usual impossibility for them to take advantage of State compensation proved terrible especially when they were victims of domestic violence or when they found themselves in disagreement with their husbands on the decision to leave or remain in contaminated areas when not subject to direct and mandatory evacuation orders but where radiation were anyway considerably high: in that cases, women had to choose between physical or psychological suffering – the latter caused by the concern of the impact of radiations on themselves and especially on children – and the possibility of living in poverty⁹¹⁴. This matter was ignored by national authorities that did not make any effort to institute some support networks to deal with women’s needs.

The issue of compensation and its importance for women that are more often in a situation of economic insecurity, is important also in the context of the Government decision to lift evacuation orders, and as a consequence suspend compensation payments. As already highlighted in the previous Chapter, the supervening lack of financial support for those women that decided to evacuate and had access to compensation, like single or divorced mothers, forced them to return to contaminated areas against their will because they no longer had the economic possibility to support themselves and their children⁹¹⁵.

However, distressful situations did not unfold only in the familial context. As it has been described in the analysis of the right to not to be subject to unhuman or degrading treatment, particularly difficult for women proved the experience in evacuation centers. There, women suffered from sexual abuses and in that case as well the government failed to adopt the necessary preventive measures and provide adequate support to women⁹¹⁶. Apart from an unacceptable number of reported sexual abuses (which is supposed to be an underestimation due to the fear or shame to denounce on the part of women⁹¹⁷), women’s living conditions in evacuation centers was in general really dire because of the fact that centers were managed by man that ignored women’s necessities,

⁹¹² Ibid.

⁹¹³ Saito F. (2012). ‘Women and the 2011 East Japan Disaster’, in *Gender & Development*, Vol.20, No.2, p. 267.

⁹¹⁴ Ulrich K. (2017). *Unequal Impact – Women’s and Children’s Human Rights Violations and the Fukushima Daiichi Nuclear Disaster*. Greenpeace Japan, p.5

⁹¹⁵ Wecker K. (10th March 2017). *Six years after Fukushima – women and children still suffer most*, Deutsche Welle. Available at: <https://www.dw.com/en/six-years-after-fukushima-women-and-children-still-suffer-most/a-37871135> (accessed: 2 July 2021)

⁹¹⁶ Ulrich K. (2017). *Unequal Impact – Women’s and Children’s Human Rights Violations and the Fukushima Daiichi Nuclear Disaster*. Greenpeace Japan, p.5

⁹¹⁷ Saito F. (2012). ‘Women and the 2011 East Japan Disaster’, in *Gender & Development*, Vol.20, No.2, p. 270.

despite the warnings forwarded by the Gender Equality Bureau⁹¹⁸; what was especially missing was privacy which made women feel extremely unsafe. In addition, due to the well-rooted presence of traditional gender roles, women were called to prepare meals, take care of elderly people or anybody in need, do the chores and hence forth; so, not only were women extremely worried about what had occurred, but they were also frustrated because their concerns and needs were not addressed, so that they were mentally and physically overburdened.

Finally, there is another aspect that is worth being stressed regarding the condition of women in the aftermath of the Fukushima nuclear accident: social stigma. Women in reproductive age were extremely concerned about the possible effects of radiation exposure on their reproductive health, and especially about the possibility to be refused by potential partners and discriminated because of that⁹¹⁹: they were considered and publicly portrayed as broken, flawed women.

For all these reasons, after the end of the emergency, it was clear that something had to be done concretely to prevent similar situations, by including women's perspective in disaster response plans. Worth of mention is the initiative undertaken by two researchers, called PhotoVoice. The aim was to "[...] conduct a research project to help develop more inclusive, gender-informed disaster responses and policies. Participatory action research methods would enable us to obtain empirical data that reflect the perspectives of disaster victims, especially women"⁹²⁰. So, the promoters of this initiative sought to establish a sort of collaboration and interaction with affected people, especially women: PhotoVoice was based on the organization of group meetings where affected people had the possibility to show pictures taken during the emergency period and explain why they were important and meaningful; this was a way to start discussions on what they went through during the emergency and the implication of the disaster on their lives⁹²¹. Experiences shared during these meeting had to serve as starting point for the development of a real gender-based perspective on disaster response.

However, it is not accurate to portray Fukushima women as only victims and passive voices. In the aftermath of the nuclear disaster women showed an incredible strength and willpower. Because of the Government failures, silences, omissions, and disinformation, especially regarding radiation

⁹¹⁸ Ibid., p. 268.

⁹¹⁹ Ibid., p. 272.

⁹²⁰ Social Work Blog. (n.d.). *Participatory Investigation of the Great East Japan Disaster: PhotoVoice from Women Affected by the Calamity*, Social Work Blog – National Association of Social Workers. Available at: <http://www.socialworkblog.org/nasw-publications/2018/07/participatory-investigation-of-the-great-east-japan-disaster-photovoice-from-women-affected-by-the-calamity/> (accessed: 2 July 2021).

⁹²¹ Ibid.

levels and food contamination, a feeling of distrust was pervasive. This feeling was strong particularly among women and mothers, concerned for the health repercussions. For this reason, Fukushima mothers did not stay idly by and set up a laboratory to test everything they could in order to be sure about the real contamination levels⁹²². The initiative is extraordinary because those who run the laboratory were not scientists, but simple mothers worried for the future of their children that learnt how to use professional equipment and carry out examinations from scratch; this is why the laboratory was called *Tarachine*, namely “beautiful mother”⁹²³. These women said that “[n]o experts who knew about measuring radiation came to us. It was chaos”⁹²⁴. So, they decided to react strongly against the inefficiencies of the Japanese government to protect the life of their children, as well as their own.

Yet, the resilience and strength of Fukushima women did not stop here. Women were at the forefront in protesting against nuclear power and the government silence. Ulrich summarizes their determination by acknowledging that “[t]hey have been at the forefront of legal challenges from spearheading cases that brought criminal charges against TEPCO to filing lawsuits to secure fair compensation. They have been a driving force behind mass demonstrations and nonviolent direct actions. Many are involved in the fights to keep reactors throughout Japan offline. They have started online networks to share information”⁹²⁵. In particular, a group of brave women founded a movement called *Fukushima no Onnatachi*, meaning “women of Fukushima”; they spoke up against the government’s cover-ups, the shortcomings of the clean-up operations and boldly denounced the consequences of the nuclear accidents - some of them avoidable if the government authorities had acted differently - , on their lives⁹²⁶.

The case of the Fukushima nuclear accident is just an example of how women are more exposed to sufferings in case of disasters. Indeed, similar or even worse situations (it must be recalled that Japan, being a territory very prone to extreme natural events, is supposed to be one of the most prepared to face emergencies and still problems are dramatically evident) are likely to occur also in different national contexts. What worries is that despite the issue of gender equality is mainstream,

⁹²² Sturmer J., Asada Y. (11th May 2019). *Fukushima’s mother became radiation experts to protect their children after nuclear meltdown*, ABC News. Available at: <https://www.abc.net.au/news/2019-05-12/fukushima-mums-teach-themselves-how-to-be-radiation-experts/11082520> (accessed: 21 March 2021).

⁹²³ Ibid.

⁹²⁴ Ibid.

⁹²⁵ Ulrich K. (2017). *Unequal Impact – Women’s and Children’s Human Rights Violations and the Fukushima Daiichi Nuclear Disaster*. Greenpeace Japan, p.8.

⁹²⁶ Dianuke (25th September 2015). *Women of Fukushima: how women have suffered the accident and the apathy*, Dianuke.org. Available at: <https://www.dianuke.org/women-of-fukushima-how-women-have-suffered-the-accident-and-the-apaty/> (accessed: 3 July 2021).

significant, actual and practical advancements are still hard to be seen⁹²⁷. What is more is that, considering the countries that possess operating nuclear facilities, 15 out of 35 rank beyond the seventy-second place of the 2021 Global Gender Gap Index ranking (UAE ranks 72, Ukraine 74, Czech Republic 78, Russia 81, Romania 88, Brazil 93, Hungary 99, South Korea 102, China 107, Armenia 114, Japan 120, Turkey 133, India 140, Iran 150, Pakistan 153)⁹²⁸, and considering that existing inequalities are magnified and exacerbate in emergency times, accidents are very likely to lead to situations for women even worse than those recorded in Japan. Plus, not only are these countries characterized by severe gender inequalities, but some of them are also rather poor countries, which means that they have lesser capabilities to cope with the consequences of nuclear accidents, and here the whole debate on IDRL and the necessity to establish universally-accepted rules for international assistance opens up again.

3.3. Women and climate change.

It has been demonstrated how nuclear energy can hardly be considered as an effective tool to contrast the advancement of climate change. A push to invest more and more economic resources in the development of the nuclear industry to accomplish the energy transition to (almost) carbon-neutral energy sources, would mean that emissions will not decrease before at least two decades. Recalling that CO₂ emissions from the energy sector amount to two thirds of total GHG emissions, further heavy investments in the field of nuclear energy will not help to solve environmental and climate problems in the short run; on the contrary, due to the presence of climate inertia, the situation is also believed to keep worsening considerably, even though emissions are fully abated now. Therefore, the longer we postpone hefty emissions cut, the longer it will take to appreciate a positive reversion of climate change. In the meanwhile those who suffer the most the effects of climate change are women, and in particular women from the global south.

Scholars and scientists have amply turned the attention to the specific effects of climate change and how they differ according to the specific geographical areas. However, as well as geographic differentiations on the intensity with which climate change occurs and is felt, the impact of climate change varies also according to circumstances related to social, cultural and human factors. In brief,

⁹²⁷ See e.g. Padavic I., Ely R. J., Reid E. M. (2019). 'Explaining the Persistence of Gender Inequality: The Work–family Narrative as a Social Defense against the 24/7 Work Culture', in *Administrative Science Quarterly*, Vol.65, No.1, pp.61-111. They argue that "[s]tagnation' is the word many use to describe women's stalled movement into high-level positions that offer opportunities to wield power and influence".

⁹²⁸ World Economic Forum (2021). *Global Gender Gap Report 2021*. Geneva: the World Economic Forum.

climate change is not gender-neutral⁹²⁹. In this context, gender roles, that are socially constructed, play a pivotal role in defining how climate change is perceived differently by men and women, especially in the countries of the global south where the effects of climate change are more dramatically evident and traditional gender roles, for which women have to deal with the household, are still at the basis of their societies. So, women are more vulnerable not because they are women, but because of social and cultural constructions. Enarson, cited in Resurrección, claims that

[...] vulnerability is not an intrinsic characteristic, or does not derive from a single factor such as 'being a woman', but is indicative of historically and culturally specific patterns of practices, processes and power relations that render some groups or persons more disadvantaged than others. Vulnerability is therefore a dynamic condition shaped by existing and emerging inequities in resource distribution and access, the control individuals are able to exert over choices and opportunities, and historical patterns of social domination and marginalization, and not solely a set of intrinsic properties that individuals or groups possess⁹³⁰.

There is a considerable number of studies that focused on the physical and material impact of climate change on women in the global south. The persistence of rigid and traditional gender roles often leads to the fact that women, especially those pertaining to the lowest strata of society, are less educated, informed, poorer, and have limited access to processes of decision-making and support⁹³¹. For these reasons, and, again, because of the role they are assigned in the context of the household, namely procure food, water and wood, and take care of children, women are at disadvantage when it comes to coping with climate change and they are the first victims of climate change-related events and phenomena.

Since women have to deal with farming, harvesting, wood collection, water procurement, cleaning and cooking, the increase in intensity and frequency of extreme weather events is intensifying women's workload⁹³². A paramount example concerns water procurement: in many regions of the poor global south, water resources have depleted because of higher temperature and drought or

⁹²⁹ Yadav S. S., Lal R. (2017). 'Vulnerability of women to climate change in arid and semi-arid regions: The case of India and South Asia', in *Journal of Arid Environments*, Vol.149, pp. 4-17.

⁹³⁰ Resurrección B. P. (2013). 'Persistent women and environment linkages in climate change and sustainable development agendas', in *Women's Studies International Forum*, Vol. 40, p.39.

⁹³¹ Yadav S. S., Lal R. (2017). 'Vulnerability of women to climate change in arid and semi-arid regions: The case of India and South Asia', in *Journal of Arid Environments*, Vol.149, p. 5.

⁹³² *Ibid.*, p.6.

they are heavily contaminated. Therefore, women are forced to cover longer distances to get water and spend more time in trying to purifying it⁹³³. This, together for instance with wood decreasing availability, has a negative impact on girls' educational opportunities and health⁹³⁴: if it takes more time to carry out domestic tasks, they cannot go to school, and the fact of being forced to walk longer distances to get access to water and other necessary resources and carry them home can cause backache and injuries, complications for pregnant women and lead to an increase in the risks of sexual abuses during the journey⁹³⁵. In addition, water is necessary also for sanitation and personal hygiene, therefore its shortage and impurity might lead to serious infections to which women are more exposed, especially during their period⁹³⁶. Yet, women's health is also stressed by food shortage, as well as water. Yadav and Lar state that "[t]hough women prepare food for the whole family, they are often the last to eat whatever remains. Because they prioritize food for the family, they often have to forgo meals. Such 'food hierarchies' exacerbate protein deficiencies in women, decrease immunity and increase susceptibility to diseases"⁹³⁷.

The increase of women's workload is not simply caused by a deterioration of resources due to the effects of climate change. Climate change is pushing people to emigrate, but very often it is men who emigrate in order to look for better job opportunities, leaving their families in their home country. After men leave, women are fully responsible for supporting the family and the lack of economic resources force them to yield to new forms of slavery and to sexual exploitation⁹³⁸. However, sexual exploitation is also a direct consequence of climate change: natural disasters can worsen the already precarious living conditions of women and push them to accept everything to improve their economic condition, thus exacerbating the plague of human trafficking for sexual purposes.

Finally, the condition of women is particularly aggravated by climate change because they have less access to education and training that are fundamental to develop their understanding of possible lifesaving adaptation strategies. In this sense, there is a negative vicious cycle: as described above, climate change increase women's workload, so that they have less and less time available for having

⁹³³ Mitchel T., Tanner T., Lussier K. (2007). *We know what we need – South Asian women speak out on climate adaptation*. Institute of Development studies and Actionaid, p.7.

⁹³⁴ Ibid.

⁹³⁵ UNIDO and UN Women (2013). *Sustainable energy for all: the gender dimension*, p.6. Available at: <https://www.unwomen.org/en/digital-library/publications/2013/5/guidance-note---sustainable-energy> (accessed: 4 July 2021).

⁹³⁶ Yadav S. S., Lal R. (2017). 'Vulnerability of women to climate change in arid and semi-arid regions: The case of India and South Asia', in *Journal of Arid Environments*, Vol.149, p. 9.

⁹³⁷ Ibid., p. 9.

⁹³⁸ Ibid., p. 10.

access to training and information that could help them in improving their situation that, in turn, keeps worsening⁹³⁹.

So, women are those who suffer the most the effects of climate change. However, even though they are the main victims, there are not adequately represented, at all different levels – local, national and international – when climate change-related policies are discussed. It must be stressed that in the 1980s and 1990s women were the first to raise global awareness about environmental problems, leading various environmental movement (e.g. the Chipko movement, the Greenbelt Movement)⁹⁴⁰. Nevertheless, women's preeminence in the field of the environment started to fade from the late 90s, when women became a small and rather invisible minority; indeed, environmental and climate problems have growingly been framed as “techno-scientific problems requiring technical solutions”⁹⁴¹, and requiring global political action. Framing climate change as such had two major consequences: first, climate change, becoming a scientific and political issue, incurred a process of masculinization; indeed, those who were considered entitled to speak about climate change and propose actions to counter it were man, since “[m]en far outnumber women in scientific and decision-making organizations that have responsibility for addressing the climate crisis”⁹⁴². Plus, the invisibility of women in decision-making processes related to the fight against climate change worsened as climate change came to be considered as a security problem⁹⁴³, so it entered the field of hard politics that is dominated by men. Second, climate change became increasingly portrayed as universal problem by scientists, affecting humanity as a whole; while it is true that climate change is a global concern, its universalization, and the assumption that everybody somehow feel its negative consequences, led to the disregard of a more gendered perspective on its effects⁹⁴⁴.

Up to now, women, in relation to the effects of climate change, have been seen as victims, as vulnerable. Nevertheless, women are also frequently considered as valuable resources in the fight against climate change. Indeed, Yadav and Lal argue that

⁹³⁹ Ibid., p. 5.

⁹⁴⁰ Resurrección B. P. (2013). ‘Persistent women and environment linkages in climate change and sustainable development agendas’, in *Women's Studies International Forum*, Vol. 40, p. 33.

⁹⁴¹ MacGregor S. (2010). ‘Gender and climate change’: from impacts to discourses’, in *Journal of the Indian Ocean Region*, Vol.6, No.2, p.230.

⁹⁴² Ibid. In addition see Gay-Antaki M., Liverman D. (2018). ‘Climate for women in science. Women scientists and Intergovernmental Panel on Climate Change’, in *PNAS*, Vol. 115, No. 9, pp. 2060-2065, for a focus on the IPCC.

⁹⁴³ See Wallace D., Silander D. (2018). *Climate Change, Policy and Security*. New York: Routledge, pp.5-7.

⁹⁴⁴ MacGregor S. (2010). ‘Gender and climate change’: from impacts to discourses’, in *Journal of the Indian Ocean Region*, Vol.6, No.2, pp. 223-224.

[...]women play an important role in developing climate-smart households through sustainable options for managing the household gardens, ensuring food and nutritional security, increasing diversity of food sources and by adopting preventive measures such as boiling and filtering water and using mosquito netting, etc. They also enhance eco-efficiency by combining the traditional with the modern knowledge and recycling wastes [...] ⁹⁴⁵.

Therefore, women are paramount in introducing adaptation and mitigation measures in the context of housework. In a certain sense, they are forced to engage in adaptation and mitigation because they are the first who perceive the effects of climate change in their daily life, while performing their daily activities. To make an example, as already underlined, climate change exacerbates the problem of food shortage; for this reason, women are trying to make use of their traditional knowledge and expertise to implement new farming and storage techniques, diversify agricultural production in order to cope with possible crop failures induced by climate phenomena, and grow more climate change-resistant crops ⁹⁴⁶. In addition, women can be considered as valuable resources not only because they personally engage in adaptation and mitigation, but also because in doing so and being closer to nature because of the tasks they are entrusted with, they have acquired specific understanding and knowledge about the environment that surrounds them and have developed strategies to manage natural resources efficiently, and this knowledge can be put at the service of policy-makers to devise more effective policies to counter the effects of climate change ⁹⁴⁷.

So, women are seen as either victims or valuable resource. However, many authors have started to criticize this stereotypical categorization of women in relation to climate change. Resurrección concludes that

[...] while it may be politically strategic to muster the entry of gender into climate negotiations through a centred and climate-vulnerable feminine subject, climate programmes will be better served by more agile understandings of women, men and their actual multi-dimensional experiences and adaptations to a changed climate. A climate change policy regime will therefore benefit less from political imaginaries of women and environment ties, but from flexible

⁹⁴⁵ Yadav S. S., Lal R. (2017). 'Vulnerability of women to climate change in arid and semi-arid regions: The case of India and South Asia', in *Journal of Arid Environments*, Vol.149, p. 11.

⁹⁴⁶ Ibid.

⁹⁴⁷ Ibid.

readings of life on the ground, or in short, a stronger and more complex social analysis of climate, environment, power and people that informs response and action⁹⁴⁸.

So, categorizing women as such is seen as a political process aimed at reducing women to a single rather homogenous group: women as victims, or women as virtuous examples. This is said to be a dangerous simplification of the situation of women that prevent positive advancements that might stem from a more insightful and punctual analysis.

Particularly criticized by authors was the idea of women as vulnerable and victims. MacGregor argues that the result of portraying women as such is that, first, women enter climate change debates only to the extent that they are climate victims and they are seen as fragile, powerless and vulnerable⁹⁴⁹; second, the effects and impact of climate change are reduced to very objective, measurable and sterile idea: climate change has effects that can be quantified and cause victims that can be counted. In this way, there is little room for a more diversified, subjective perspective on the effects of climate change; in few words, “there is very little room for human voices”⁹⁵⁰. In this sense, adopting a gendered perspective on climate change implies going in depth into existing power relations, social constructions related to the idea of femininity and masculinity, cultural norms that are all at the basis of established gender roles, all this taking into account the different contexts because “women are not a homogenous category”⁹⁵¹. Only analyzing these factors, it is possible to identify the specific sources of women’s vulnerability to climate change and, consequently, to act in order to strengthen women’s rights and improve their living conditions. A simple and superficial assumption based on numbers and objective facts that women are the main victims of climate change is not constructive and can even be counterproductive because, as Arora-Jonsson argues, “[t]his insistence on women’s universal vulnerability (at least as far as the developing world is concerned) can have an opposite effect, that is, gender is made invisible in the debates on climate change since it is assumed that we know what the problem is – the vulnerability of women”⁹⁵².

⁹⁴⁸ Resurrección B. P. (2013). ‘Persistent women and environment linkages in climate change and sustainable development agendas’, in *Women's Studies International Forum*, Vol. 40, p. 41.

⁹⁴⁹ MacGregor S. (2010). ‘Gender and climate change’: from impacts to discourses’, in *Journal of the Indian Ocean Region*, Vol.6, No.2, p. 227.

⁹⁵⁰ Ibid.

⁹⁵¹ Arora-Jonsson S. (2011). ‘Virtue and vulnerability: Discourses on women, gender and climate change’, in *Global Environmental Change*, Vol.21, p. 749.

⁹⁵² Ibid., p. 748

However, it must be said that empirical records and data are still fundamental to grasp the urgency to address climate change: they are fundamental to keep climate change high in the political agenda. It can be said that, in order to improve the living conditions of women in relation to the effects of climate change, two parallel processes have to be set in motion: on the one hand, it is necessary to include a constructive gender-based perspective on climate change aimed at tackling all those social, cultural and political factors that aggravate women's condition; second, it is still fundamental to keep an objective and scientific view on the impact of climate change in order to devise scientific-based, effective and *rapid* strategies of adaptation and especially of mitigation. The condition of women will improve radically only if both processes are taken seriously.

Conclusion

This dissertation, as specifically stated in the introduction, had the aim of analyzing how the production of nuclear energy is regulated at the international level, in order to see whether this legal framework can be considered as satisfactory or not. Secondly, it had the purpose of delving into the human rights and environmental issues that can arise in connection with nuclear energy production, especially in case of disasters and accidents.

As far as the first goal is concerned, Chapter 1 and Chapter 2, that were devoted to the analysis of the two branches of International Law called International Disaster Response Law (IDRL) and International Nuclear Law (INL) - where the latter can even be considered as a sub-branch of the former - revealed how the legal framework which regulates the main aspects of nuclear energy production cannot be considered as completely satisfactory. It has been shown how the field of IDRL has evolved rapidly in the last decades, but this development occurred confusedly and without much coordination between different instruments and different levels of regulation, thus giving rise to a regime that can be described as rather fragmented, sometimes inconsistent and fraught with gaps, lack of clarity and preciseness. These are all flaws that the work of the International Law Commission concerning the drawing-up of the Draft Articles on the Protection of Persons in the Event of Disasters had the purpose to solve, but it managed to do so only partially because, even though the Draft Articles will give rise to a binding convention, it will be a general Framework Convention. This situation of uncertainty and non-clarity that surrounds the field of IDRL is detrimental for the attainment of the main purpose it has, namely the eversion minimization of the negative effects of disasters on the population and the environment.

On the other hand, INL, that witnessed a major development in the aftermath of the Chernobyl nuclear accident which dramatically showed how the field of nuclear energy production necessitated a stronger regulation, comprises a series of binding international conventions that constitute a regime that can be described as rather punctual. Nevertheless, it has been pointed out how in this case as well important shortcomings can be identified, especially regarding the incentive nature of the two Conventions on nuclear safety, limits that clearly emerged in the context of the Fukushima post-disaster assessments and international meetings, the obligations contained in Early Notification and Assistance Convention, and several aspects linked to the Conventions on the liability for nuclear damage. What can be stated is that INL was profoundly affected by the Chernobyl and Fukushima catastrophes that, because of the negligence demonstrated by national

authorities, triggered deep discussions especially about nuclear safety, thus boosting the strengthening of the regime. Despite that, still today, it reflects what it is possible to achieve in a field that is considered highly strategic by States, and for this reason they are reluctant to accept a stronger and more intrusive international regulation.

Concerning the second goal, namely that of paying attention to the human rights and environmental issues linked to nuclear energy, Chapter 4, departing from the empirical cases of Chernobyl and Fukushima, shed light on the series of fundamental human rights that can be jeopardized or violated in the context of nuclear emergencies and accidents. The analysis demonstrated how violations take place because nuclear states invested economic resources in the building and operation of nuclear power plant, but they did not parallelly invest and engage in the development of strong national regulatory framework – as international the Conventions prescribe -, activity surveillance, and the definition of clear and well-organized emergency plans and assistance schemes. This translates into a fundamental disregard of the States' duty to protect all those under their jurisdiction from any possible harm.

Finally, the discussion turned to the issue of climate change and concluded that there is consistent evidence which proves that nuclear energy cannot be considered as a valuable tool to address the problem. What is more, it has been argued that, applying the reasoning put forward by the Dutch Courts in the landmark Urgenda Case, States which may decide to invest in nuclear energy to accomplish their energy transition - a transition that in that way would prove very slow - could eventually be ordered by Courts to change their plans, in the name of the protection and respect of human rights.

To conclude, a question that might be asked is the following: how is the future of nuclear energy supposed to be? It is not easy to predict how the industry of nuclear energy will evolve in the decades to come. However, today's trends reveal that, after a period of nuclear renaissance that took place in the early 2000s⁹⁵³, States are investing more and more in renewable energy sources⁹⁵⁴, while nuclear energy is set aside, since the former are less costly, less risky and more reliable. This trend is a consequence of, first, an increasing skepticism and resistance on the part of the civil society to accept nuclear energy due to safety concerns and worries about the future management of spent fuel; second, because of States decreasing interest in nuclear energy and increasing popular

⁹⁵³ See Nelson P. (2010). 'Reassessing the nuclear renaissance – A historical perspective reveals some unanticipated possibilities for the next 20 years', in *Bulletin of the Atomic Scientists*, July/August 2010.

⁹⁵⁴ See Carrington D. (2019) *Nuclear power can be green but at a price*, The Guardian. Available at: <https://www.theguardian.com/environment/2019/jan/17/nuclear-power-can-be-green-but-at-a-price-hitachi-toshiba-wylfa> (accessed: 3 July 2021).

resistance, innovation and research are gradually focusing on improving the performance of renewable energy technologies⁹⁵⁵. In brief, it seems that the future of nuclear energy is fraught with uncertainty: unless technological development is able to develop and introduce some new types of reactors that can prove less costly, and especially more rapid to be built, much safer and able to fully withstand the effects of climate change that are becoming harsher, all this accompanied by a massive international campaign supported by undisputed scientific evidence to convince the public opinion to accept nuclear energy, it can be argued that thinking about a new nuclear renaissance is rather unlikely.

⁹⁵⁵ See Larsen T. (22nd August 2020). 'Nuclear Energy Is Not a Climate Solution: Response to Gary S. Was and Todd R. Allen', in *New Labor Forum*, Vol.29, No.3, p. 19.

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