

**REALISING THE RIGHT TO THE HIGHEST ATTAINABLE  
STANDARD OF HEALTH IN THE NUCLEAR INDUSTRY**

**SIYABULELA MNGXEKEZA**

**STUDENT NUMBER:**

**3582555**

**RESEARCH PAPER**

**submitted in accordance with the requirements for the LLM degree**

**in the Faculty of Law**

**of the**

**UNIVERSITY OF THE WESTERN CAPE**

**Supervisor: EBENEZER DUROJAYE**

**Professor of Law**

**University of Western Cape**

**Faculty of Law**

## DECLARATION

I declare that '**REALISING THE RIGHT TO THE HIGHEST ATTAINABLE STANDARD OF HEALTH IN THE NUCLEAR INDUSTRY**' is my work and that all sources that I have used or quoted have been indicated and acknowledged through complete references.

Signature     Siyabulela Mngxekeza

Date:            1/15/2019



UNIVERSITY *of the*  
WESTERN CAPE

## **Acknowledgements**

Firstly, I would like to thank the Lord for being with me throughout the writing process of this research paper and giving me the strength to complete it

I would also like to express my gratitude to Professor Ebenezer Durojaye for his help and support. Professor Durojaye supervised and guided me throughout the writing progress of this paper. I would also like to thank Professor Benyam Mezmur, who added significant value and insight into why it is crucial to protect all human rights.

Lastly, I would like to thank my family, friends and colleagues for their support during the research and writing of this paper. Your endless support kept me motivated during the days when I had no self-belief.



## TABLE OF CONTENTS

Declaration		ii
Acknowledgements		iii
Abstract		vi
Abbreviations and acronyms		viii
CHAPTER 1: INTRODUCTION		1
1.1	Background	1
1.2	Problem statement	5
1.3	Research questions	5
1.4	Delineations	6
1.5	Relevance of the study	6
1.6	Methodology	6
1.7	Literature review	7
1.8	Conclusion	14
CHAPTER 2: INTERNATIONAL LEGAL PROTECTION AND ANALYSIS		15
2.1	Introduction	15
2.2	International Covenant on Economic, Social and Cultural Rights (ICESCR)	18
	2.2.1 The right to health expressed in the ICESCR	21
2.3	African Charter on Human Rights	24
	2.3.1 The right to health in the African Charter	26
2.4	Conclusion	28
CHAPTER 3: SOUTH AFRICAN LEGAL PROTECTION AND ANALYSIS		30
3.1	Introduction	30
3.2	The right to health in the Constitution	31
3.3	The right to health inferred in national legislations and policies specific to the nuclear industry	34
3.4	Conclusion	37

CHAPTER 4: NUCLEAR GOVERNANCE IN SOUTH AFRICA		39
4.1	Introduction	39
4.2	Lessons learned from the Fukushima Accident	41
CHAPTER 5: RECOMMENDATIONS AND CONCLUSION		43
5.1	Introduction	43
5.2	International conventions and treaties	43
5.3	Recommendations	43
5.4	Conclusion	45
REFERENCES		46
Books		46
Chapters in Books		46
Journal Articles		47
Newspapers and Periodicals		49
Reports		50
South African Legislation		51
Legislation of Other Countries		52
Case Law		52
	South Africa	52
	Europe	52
	African Commission	52
White Paper		52
Policy Documents		52
	South Africa	52
	International	53
Miscellaneous Internet Sources		53
Theses		55



## ABSTRACT

African states are interested in the development of nuclear power (also referred to as atomic power) for the generation of electricity and desalination. These include Algeria, Egypt, Ghana, Kenya, Morocco, Namibia, Niger, Nigeria, Tunisia, South Africa, and Uganda.<sup>1</sup> The nuclear governance in South Africa has adopted principles into its legal system which require it to comply with the objectives of numerous resolutions, conventions, treaties, bilateral and multilateral agreements.<sup>2</sup> Therefore, there is an obligation upon the government through 'reasonable legislative and other measures' to manage nuclear matters, such as nuclear accidents, in a manner that protects the general public, atomic industry workers as well as prevents the pollution of the surrounding environment.

It has been seven years since the Fukushima Daiichi Nuclear Power Plant Accident that occurred in Japan on 11 March 2011, when considerable amounts of radioactive material from the damaged plant released into the environment. Health hazards, associated with exposure to low levels of ionising radiation, are a significant concern following such an accident. A nuclear disaster can potentially violate not only the right to health of workers, but that of residents and evacuees alike, particularly pregnant women, older persons, and children. Regional and international human rights conventions impose obligations on state parties to "take whatever steps necessary to ensure that the right to the highest attainable standard of health is enjoyed by all as soon as possible".<sup>3</sup> In most cases, when a nuclear accident occurs, workers within the

---

<sup>1</sup> Nuclear Energy Agency 'Impacts of the Fukushima Daiichi Accident on Nuclear Development Policies' (2017) Organisation for Economic Co-Operation And Development(OECD) 57. available at <https://inis.iaea.org/collection/NCLCollectionStore/Public/48/058/48058392.pdf> (accessed 8 September 2018).

<sup>2</sup> In general, these principles include 'the safety principle, the security principle, the responsibility principle, the permission principle, the continuous control principle, the compensation principle, the sustainable development principle, the compliance principle, the independence principle, the transparency principle, and the international co-operation principle'.

<sup>3</sup> UN (ICESCR) 'General Comment No. 14: The right to the highest attainable standard of health' (11 August 2000) U.N. Doc. E/C.12/2000/4. Art. 12. Para 33; Organization of Unity (OAU), *African Charter on Human and Peoples' Rights (Banjul Charter)*, 27 June 1981, CAB/LEG/67/3 rev. 5, 21 I.L.M. 58 (1982), available at <http://www.refworld.org/docid/3ae6b3630.html> (accessed 21 August 2018). Hereafter known as the Charter.

nuclear plant are expected to mitigate emergencies. The danger of this expectation is that it could violate their fundamental human rights.



**KEYWORDS:**

cancer; environmental safety; government; nuclear energy; nuclear power; atomic workers; nuclear exposure victims, radiation; right to the environment; right to health; socio-economic rights; sustainability



UNIVERSITY *of the*  
WESTERN CAPE



## ABBREVIATIONS and ACRONYMS

ACHPR	African Commission on Human and Peoples' Rights
AECB	Atomic Energy Control Board
AECL	Atomic Energy of Canada Limited
AFCONE	Commission on Nuclear Energy
CESCR	Committee on Economic, Social and Cultural Rights
CO <sub>2</sub>	Carbon Dioxide
COMARE	Committee on Medical Aspects of Radiation in the Environment
CERD	Convention on the Elimination of All Forms of Racial Discrimination
CNS	Convention on Nuclear Safety
DEA	The Department of Environmental Affairs
DoE	The Department of Energy
DMR	Department of Mineral Resources
ECSR	European Committee of Social Rights
ELA	Earthlife Africa
ESKOM	Electricity Supply Commission
GCCR	German Childhood Cancer Registry
GDP	Gross Domestic Product
GHG	Greenhouse gas (GHG) emissions
IAEA	International Atomic Energy Agency
IARC	International Agency for Research on Cancer
ICESCR	International Covenant on Economic Social and Cultural Rights
ICRP	International Commission for Radiological Protection
ILO	International Labour Organization
IRP	Integrated Resource Plan



KiKK	Epidemiologische Studie zu Kinderkrebs in der Umgebung von Kernkraftwerken
MFHR	Marangopoulos Foundation for Human Rights
mSv/yr	Millisievert per year
MTCT	Mother to Child Transmission
NECSA	The South African Nuclear Energy Corporation
NEMA	National Environmental Management Act 107 of 1998
NHL	Non-Hodgkin lymphoma
NNEECC	National Nuclear Energy Executive Coordinating Committee
NNR	The National Nuclear Regulator
NRRW	National Registry for Radiation Workers
NRWDI	The National Radioactive Waste Disposal Institute
PFMA	Public Finance Management Act 1 of 1999
PP	Public Protector
SAHRC	South African Human Rights Commission
SDG	Sustainable Development Goal
SERAC	Social and Economic Rights Action Center and the Center for Economic and Social Rights
SPDC	Shell Petroleum Development Corporation
TAC	Treatment Action Campaign
UNGA	United Nations General Assembly
UNSCEAR	United Nations Scientific Committee on the Effects of Atomic Radiation

# CHAPTER 1: INTRODUCTION

## 1.1 Background

Since 1985, South Africa has operated two nuclear power station reactors, namely, Koeberg 1 and Koeberg 2.<sup>4</sup> These reactors generate five per cent of the country's electricity.<sup>5</sup> However, in 2008, South Africa experienced severe countrywide electricity shortages termed 'load shedding'.<sup>6</sup> The Electricity Supply Commission (Eskom), a state-owned power utility, was unable to meet the growing national energy demands because of its ageing nuclear and conventional infrastructure. "Load shedding" prompted the government to replace the two struggling Koeberg reactors.

South Africa is a country with an energy-intensive economy because of the exploitation of mineral resources, which require the industrial sector (manufacturing and mining) to consume approximately 40 per cent of the electricity generated. This vital sector accounts for about 35 per cent gross domestic product (GDP) of the country.<sup>7</sup> Coal is the chief energy source for South Africa's industrial and socio-economic development and accounts for about 90 per cent of the country's electricity generating capacity.<sup>8</sup>

Recent concerns about the instability of the coal price, depletion of limited coal reserves, and global warming have prompted South Africa and other countries to re-think their strategy on energy generation.<sup>9</sup> Some of the challenges are that this reliance on coal-based electricity generation comes with several negative environmental, health and sustainability issues as a result of significant pollution caused by

---

<sup>4</sup> Schneider M, Froggatt A, Hazemann J, Fairlie I, Katsuta T & Maltini et al *The World Nuclear Industry Status Report 2016* (2016) 117. Koeberg 1 and Koeberg 2 are pressurised water reactors and were built by Framatome (now Areva) and commissioned successively in 1984 and 1985.

<sup>5</sup> Department of Energy 'Integrated Resource Plan for Electricity 2010-2030' available at

[http://www.energy.gov.za/IRP/irp%20files/IRP2010\\_2030\\_Final\\_Report\\_20110325.pdf](http://www.energy.gov.za/IRP/irp%20files/IRP2010_2030_Final_Report_20110325.pdf).

<sup>6</sup> Schneider M et al (2016) 117.

<sup>7</sup> Glazewski J *Environmental Law in South Africa* 2 ed (2000) 488.

<sup>8</sup> Glazewski J (2000) 488.

<sup>9</sup> Department of Minerals and Resources *Nuclear Energy Policy for the Republic of South Africa* (2008)7; EngSeng C, Chee KL, Adam NG and Ngoc HLN 'The systems dynamics of nuclear energy in Singapore' (2015) 12 *International Journal of Green Energy* 73–86.

atmospheric pollutants (lead, nitrogen dioxide, particles, sulphur dioxide)<sup>10</sup> and greenhouse gas (GHG) emissions.<sup>11</sup>

In an effort to curtail some of these problems, the Department of Energy (DoE) published the Integrated Resource Plan (IRP) which prescribes that South Africa's electricity generation should comprise of 48.2 per cent coal, 13.4 per cent nuclear, 6.5 per cent hydro, 14.5 per cent renewable energy sources (solar, wind, biofuels), 11 per cent gas and 3.2 per cent others by 2030.<sup>12</sup>

The New Build Programme is an approved plan by the South African governments to increase electricity generated by nuclear energy from the current capacity of 5 per cent to 13.4 per cent by 2030 per the IRP. Therefore, in South Africa, atomic energy has been determined as a sustainable energy option, due to the abundance of uranium deposits in the country.<sup>13</sup>

While it is universally accepted by governments, including the South African government, that energy and access thereof is essential for societal development, it is equally vital that in seeking to achieve this, to consider environmental and socio-economic rights. The UN's Sustainable Development Goals (SDGs) highlights the crucial role that electricity plays in the eradication of poverty and hunger,<sup>14</sup> attaining universal primary education,<sup>15</sup> advocating for gender equality and empowerment of women,<sup>16</sup> decreasing child mortality, and improving maternal health.<sup>17</sup> Access to affordable and reliable electricity forms the basis of sustainable development, which is not unattainable without the production of sustainable energy.

---

<sup>10</sup> 'Criteria air pollutants' is a term used internationally to describe air pollutants that have been regulated and are used as indicators of air quality. The regulations or standards are based on criteria that relate to health and/or environmental effects.

<sup>11</sup> Department of Minerals and Resources 'Nuclear Energy Policy' (2008)7.

<sup>12</sup> Department of Minerals and Resources 'Integrated Resource Plan for Electricity 2010-2030' (2011) Final report

[http://www.energy.gov.za/IRP/irp%20files/IRP2010\\_2030\\_Final\\_Report\\_20110325.pdf](http://www.energy.gov.za/IRP/irp%20files/IRP2010_2030_Final_Report_20110325.pdf).

<sup>13</sup> Glazewski J (2000) 488.

<sup>14</sup> United Nations Report 'The Sustainable Development Goals' (2016). See the 7th goal.

<sup>15</sup> See the 4th goal of the UN SDGs.

<sup>16</sup> See the 5th goal of the UN SDGs.

<sup>17</sup> See the 5th goal of the UN SDGs.

In many developing countries, including South Africa, where 14.5 million of the people have no access to electricity, the government has concluded that nuclear energy is a reliable, clean, cheap, and sustainable source of power that could meet the country's energy demands.<sup>18</sup> However, in their analysis of nuclear energy, very little has been mentioned about the potentially catastrophic effects should a nuclear accident occur.<sup>19</sup>

South Africa has ratified several international human rights treaties that recognise the right to health. These include:

- the International Covenant on Economic, Social and Cultural Rights (ICESCR or the Covenant);
- the Convention on the Elimination of All Forms of Racial Discrimination;
- the Convention on the Elimination of All Forms of Discrimination Against Women;
- the Convention against Torture and Other Cruel, Inhuman or Degrading Treatment;
- the Convention on the Rights of the Child and its two Optional Protocols (the International Convention on the Rights of Persons with Disabilities and the International Convention for the Protection of All Persons from Enforced Disappearance);
- the African Charter on Human and Peoples' Rights; and
- the Convention on the Elimination of All Forms of Racial Discrimination (CERD).<sup>20</sup>

Section 231(4) of the Constitution of the Republic of South Africa, 1996 (Constitution, 1996), requires the implementation of domestic measures to enact the international instruments into law.<sup>21</sup>

---

<sup>18</sup> Glazewski J (2000) 488.

<sup>19</sup> Department of Minerals and Resources Nuclear Energy Policy (2008).

<sup>20</sup> South African Human Rights Commission *Annual International and Regional Report 2016* (2016); Hassim A, Heywood M & Burger J *Health and Democracy: A Guide to Human Rights, Health Law and Policy in Post-Apartheid South Africa* (2007) 136.

<sup>21</sup> Section 231(4) 'Any international agreement becomes law in the Republic when it is enacted into law by national legislation; but a self-executing provision of an agreement that has been approved by parliament is law in the Republic unless it is inconsistent with the Constitution or an Act of Parliament.'

The Constitution, 1996, requires the State to promote public health. Section 27(1)(a) provides that: “Everyone has the right to have access to healthcare services, including reproductive healthcare”; while section 27(1)(b) provides that the State must “take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation of the right”. Section 27(3) states that no one can be denied emergency medical treatment. Section 28(1)(c) provides for “basic healthcare services” for children, whereas section 35(2)(e) provides for “adequate medical treatment” for prisoners and detainees at the expense of State.

Section 24(a) of the Constitution, 1996, confers “the right to an environment that is not harmful to health and wellbeing” upon everyone in South Africa. Section 24(b) confers upon everyone “a right to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development”.<sup>22</sup>

In South Africa, the following Acts govern the nuclear sector; the Nuclear Energy Act,<sup>23</sup> the National Radioactive Waste Disposal Institute Act,<sup>24</sup> and the National Nuclear Regulator (NNR) Act.<sup>25</sup> The National Department of Energy (DoE) and the Department of Environmental Affairs (DEA) administer these Acts.

The South African government is developing a legislated nuclear energy industry to govern and drive atomic energy production following international safety standards.<sup>26</sup> Therefore, the process of nuclear energy expansion must be transparent, detailed and systematic, and all legal components addressed.

With regards to the right to the highest attainable standard of health, the use of nuclear energy generation as a sustainable source of electricity needs thorough investigation.

---

<sup>22</sup> The Constitution of the Republic of South Africa, 1996, section 24.

<sup>23</sup> The Department of Energy Nuclear Energy Act 46 of 1999.

<sup>24</sup> The Department of Minerals and Energy National Radioactive Waste Disposal Institute Act 53 of 2008.

<sup>25</sup> The Department of Minerals and Energy National Nuclear Regulator Act 47 of 1999.

<sup>26</sup> The Department of Energy IRP for Electricity 2010-2030 (2011) Para 3.1; Roxan A ‘Why nuclear energy is not an answer to global warming’ (2016) *IPPNW* Germany 6.

## 1.2 Problem statement

'Acceptable' levels of radiation are based on 'acceptable harm'. Proximity to a nuclear power station affects the health of atomic industry workers but also that of the surrounding communities. The ionised radiation released by the nuclear fuel chain<sup>27</sup> has an impact on the mental and physical health of the exposed population, particularly for pregnant women, the elderly, and children.<sup>28</sup> However, the health implications of exposure to ionised radiation are still unclear, as studies on long-term effects of ionising radiation are yet to conclude.

The right to health is dependent on essential determinants such as nutritious food, access to potable water, housing, and an environment that is healthy.<sup>29</sup> In 2011, the Fukushima nuclear incident in Japan contaminated the immediate environment (soil, water, and food). The Japanese authorities had to impose strict restrictions on the consumption of tap water where radioactivity was detected to be above the permissible level to minimise the public's exposure to ionised radiation.

This study seeks to shed some light on the impact of ionised industrial radiation from nuclear power facilities and on the right to the highest attainable standard of health, which is not well documented.

## 1.3 Research questions

This study seeks to investigate the relationship between industrial radiation from nuclear power plants and the right to the highest attainable standard of health for those exposed to this pollutant within the nuclear industry of South Africa.

To that end, the study poses the following research questions:

---

<sup>27</sup> Nuclear fuel chain process comprises of uranium mining, the fission process in the reactors and radioactive waste disposal process.

<sup>28</sup> Grover A (2012) *Report of the Special Rapporteur on the Right of Everyone to the Enjoyment of the Highest Attainable Standard of Physical and Mental Health* Human Rights Council A/HRC/23/41/Add 3 para 11.

<sup>29</sup> UN (ICESCR) 'Treaty Series General Comment 14' (2000) E/C.12/2000/4, para 11 available at <http://www.refworld.org/docid/3ae6b36c0.html> (accessed 15 December 2018).

- Are there any health implications associated with the nuclear industry in South Africa?
- What obligations does the South African government have to realise the right to health of nuclear disaster industry workers?
- What lessons can the South African government learn about the protection of the right to the highest attainable standard of health from the Fukushima nuclear accident in Japan?

#### **1.4 Delineations**

This study will focus only on the right to health. Only the impact of nuclear radiation on the right to the highest attainable standard of health in South Africa is included in this analysis.

#### **1.5 Relevance of the study**

This study is relevant as an assessment of whether the South African government's attempt to provide universal access to electricity has given enough consideration to the following:

- the protection of persons, property and environmental health;
- the consequence of the by-products associated with the generation of nuclear energy
- the impact of atomic energy on future generations.

It also lays the foundation for recommendations on the appropriate action that the South African government could adopt.

#### **1.6 Methodology**

This desktop study entails content, secondary data, and literature analysis. The focus of the literature review will be on recent literature and seminal work. Preference is given to laws, policies, international treaties and documents as well as academic articles and textbooks.



## 1.7 Literature review

Ever since the discovery of radioactivity, the scientists recognised that ionising radiation harms human health. The damage that radiation can cause the genetic material of a cell can lead to cancers, hereditary illnesses and congenital disabilities.<sup>30</sup> Most scientific communities have accepted the simple truth that any level of exposure to radiation is not 'safe' since any exposure to ionising radiation is harmful.<sup>31</sup>

It should be noted, however, that the standard of 'acceptable' ionised radiation exposure as measured by the average accumulated background radiation dose to an individual for one year (mSv/yr) has been decreased several times in the past decade as more evidence emerges about the harmful health effects of ionised radiation.<sup>32</sup> The International Atomic Energy Agency (IAEA), has determined that the natural levels of ionising radiation exposure in most parts of the world are about 2.4 mSv/yr.<sup>33</sup> Although these natural levels of ionising radiation are acceptable, they correlate with an increasing incidence rate of cancers, congenital disabilities, and the ageing process.<sup>34</sup> Even though 2.4 mSv/yr is the adequate level of ionising radiation exposure, nuclear industry workers exposure is at levels as high as 4mSv/yr.<sup>35</sup> At this rate of exposure, the International Commission on Radiation Protection (ICRP) Doc. 60 guidelines<sup>36</sup> have estimated that the fatality rate would be 3.2 fatal cancers per 100 workers over 40 years. Therefore, contradicting other industrial toxicological reports which consider 1/10 000 to 1/1000 000 cancer fatalities for a 40-year working period 'acceptable'.<sup>37</sup>

---

<sup>30</sup> Harvey L & Vakil C 'Human health Implications of the nuclear energy industry' (2009) 13(4) *Canadian Association of Physicians for the Environment (CAPE)* 1–34.

<sup>31</sup> BEIR VII Phase 2 *Biological Effects of Ionizing Radiation: Health Risks from Exposure to Low Levels of Ionizing Radiation* (2006) National Academies Press Washington D.C. 15.

<sup>32</sup> Harvey L & Vakil C (2009) 13(4).

<sup>33</sup> International Atomic Energy Agency (IAEA) *Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards: General Safety Requirements* IAEA Safety Standards Series GSR Part 3 (2014).

<sup>34</sup> BEIR VII Phase 2(2006) 141.

<sup>35</sup> Harvey L & Vakil C (2009) 13(4).

<sup>36</sup> International Commission on Radiation Protection (ICRP) *Recommendations of the ICRP Document 60* (1990).

<sup>37</sup> Barle LE, Winkler GC, Glowienke S, Elhajouji A, Nunic J & Martus H 'Setting occupational exposure limits for genotoxic substances in the pharmaceutical industry' (2016) 151 *Toxicological Sciences* (1) 2–9.

Several human health studies have been conducted worldwide to uncover the link between low-level radioactive emissions from nuclear power station reactors and acute illnesses, particularly childhood leukaemia. In 1984<sup>38</sup> a study was done in the United Kingdom (UK) which suggested the prevalence of elevated rates of childhood leukaemia near nuclear installations. This discovery resulted in the founding of the Committee on Medical Aspects of Radiation in the Environment (COMARE) in 1985, which examined these reports. Since then, COMARE has published 17 investigative reports on cases of cancers and childhood leukaemia within communities near nuclear facilities. When the 17th report released in 2016, it analysed the most recent available data concerning childhood cancer in the UK and their proximity to nuclear power plants.<sup>39</sup> In this report, the authors looked at the incidence of leukaemia, non-Hodgkins lymphoma (NHL), and other types of cancers in people younger than 25 years living in proximity to Sellafield and Dounreay nuclear facilities. The results showed that there had been no new cases of leukaemia or NHL among young adults during the period 1991–2006.

In a similar study, the German Childhood Cancer Registry (GCCR) at the University of Mainz was contacted by the German government to undertake an ecological health study to mirror studies conducted in the UK in 1987<sup>40</sup> and 1989<sup>41</sup> respectively. The GCCR examined the rate of leukaemia in children under the age of 15 years living nearby (15 km) nuclear power plants over 11 years (1980-1990).<sup>42</sup> Their findings from this study indicated that there was no significant increase in the rate of leukaemia in children under the age of 15 years within the radius of 15 km, but when conducting a

---

<sup>38</sup> Black D *Investigation of Possible Increased Incidence of Cancer in West Cumbria* (1984) Report of the Independent Advisory Group HMSO London.

<sup>39</sup> Committee on Medical Aspects of Radiation in the Environment (COMARE), 17th Report, *Further Consideration of the Incidence of Cancers around the Nuclear Installations at Sellafield and Dounreay* (2016).

<sup>40</sup> Forman D, Cook-Mozaffari P, Darby S, Davey G, Stratton E, Doll R & Pike M 'Cancer near nuclear installations' (1987) 329 *Nature (Lond.)* 499–505.

<sup>41</sup> Cook-Mozaffari P Darby S Doll R Forman D Hermon C Pike M et al. 'Geographical variation in mortality from leukemia and other cancers in England and Wales in relation to proximity to nuclear installations, 1969-1978' (1989) 59 *British Journal of Cancer* 476–485.

<sup>42</sup> Nussbaum RH 'Childhood leukemia and cancers near German nuclear reactors: Significance, context, and ramifications of recent studies' (2009) 15 *International Journal of Occupational and Environmental Health* (15) 318.

similar study within a 5 km radius from the nuclear power plant, they observed a significant elevation in the rate of leukaemia.<sup>43</sup>

In 1989 and 1991, the Atomic Energy Control Board (AECB) of Canada conducted ecological health studies that showed a correlation between elevated levels of leukaemia and children residing within a 25 km radius from a nuclear facility.<sup>44</sup>

The limitations of those mentioned above and other geographical studies are that they alluded only to a possible link between the rates of an illness within a specific geographic area but failed to substantiate the cause of the disease.

Consequently, in 2002, a case-control study was conducted by GCCR on behalf of the German government focusing on individual cases of childhood cancers and leukaemia between 1980 and 2003 in the vicinity of 16 nuclear power plants in Germany.<sup>45</sup> Known as the Epidemiological Study on Childhood Cancer in the Vicinity of Nuclear Power Plants (otherwise known as Epidemiologische Studie zu Kinderkrebs in der Umgebung von Kernkraftwerken, and also by the acronym KiKK).<sup>46</sup> In the KiKK study, residential proximity to the nuclear facility was the only measured variable in segments of 0–5 km, 5–10 km, 10–30 km, 30–50 km and over 50 km. In 2008, the results of the KiKK study provided compelling evidence of a direct link between the risk of childhood leukaemia and the residential proximity to a nuclear facility. The authors of this study could conclude without any doubt that an elevated risk of leukaemia did exist in residential areas in a 0–10 km zone from a nuclear facility.<sup>47</sup>

Additional studies on the link between radioactive emissions from nuclear power station reactors and serious illnesses have indicated a possible correlation in occupational parental exposure to radiation and observed elevated rates of childhood

---

<sup>43</sup> Nussbaum RH (2009) 318.

<sup>44</sup> Clarke E, McLaughlin J & Anderson T *Childhood Leukemia around Canadian Nuclear Facilities – Phase 1 and 2* (1989/1991) A report prepared for the Atomic Energy Control Board Ottawa, Canada (Phase 1) May 1989, (Phase 2) June 1991.

<sup>45</sup> Nussbaum RH (2009) 319.

<sup>46</sup> Spix C, Schmiedel S, Kaatsch P, Schulze-Rath R & Blettner M 'Case-control study on childhood cancer in the vicinity of nuclear power plants in Germany 1980-2003' (2008) 44 *European Journal of Cancer* 275–284; Kaatsch P, Spix C, Schulze-Rath R, Schmiedel S & Blettner M 'Leukemia in young children living in the vicinity of German Nuclear Power Plants'(2008 ) 1220 *International Journal of Cancer* 721–26.

<sup>47</sup> Spix C et al (2008) 275–84.

leukaemia cases. In 1990<sup>48</sup> and 1992,<sup>49</sup> studies emerged in the UK and Canada, respectively, to determine the impact, if any, of what occupational exposure to ionising radiation could have on the prevalence of childhood leukaemia. The AECB commissioned a case-control study on 1 002 children. These children were born and resided near a nuclear power plant from 1950 to 1988. They were younger than 15 years, and 112 of them had cancer, while the remaining 890 (the control group) did not. Since their parents (fathers) worked in the nuclear industry, there was a detailed record of their occupational radiation exposure history. The data collected from employers consisted of individual identifiers, e.g. gender, date of birth, job description, and recorded history of radiation dose.

This study suggested that there might be a correlation between the higher levels of childhood leukaemia and higher levels of occupational exposure to ionising radiation.<sup>50</sup> However, the limited number of subjects in this study constituted its statistical failure. Nonetheless, the authors of this study thought that besides its lack of statistical significance, its findings were cause for concern.

Many other studies of the incidence of cancer among nuclear industry workers have been carried out in the last two decades in Canada and the UK. In the majority of these studies, the research is on nuclear industry workers exposed to occupational low-level radioactive emissions, except reviews from the Canadian National Dose Registry (NDR)<sup>51</sup>, which included many other types of radiation workers.

In 1976, the Royal Commission on Environmental Pollution in the UK hypothesised that by conducting an epidemiological study on nuclear workers, assessing the impact of occupational exposure to ionising radiation on their health, a precise radiation

---

<sup>48</sup> Gardner M, Snee M, Hall A, Powell C, Downes S & Terrell J 'Results of case-control study of leukemia and lymphoma among young people near Sellafield Nuclear Plant in West Cumbria' (1990) 300 *British Medical Journal* 423–29.

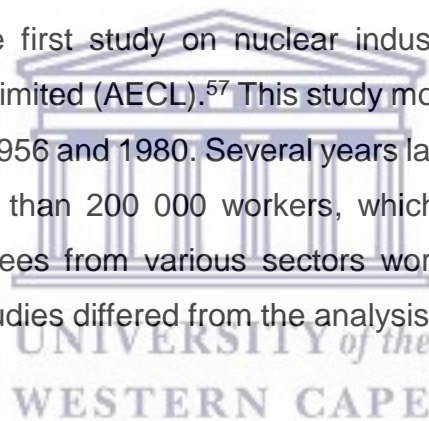
<sup>49</sup> McLaughlin J, Anderson T, Clarke E & King W *Occupational Exposure of Fathers to Ionizing Radiation and the Risk of Leukemia in Offspring – A Case-Control Study* (1992). (AECB Project No. 7.157.1). A research report prepared for the Atomic Energy Control Board, Ottawa, Canada.

<sup>50</sup> McLaughlin J et al (1992).

<sup>51</sup> Ashmore JP, Krewski D, Zielinski JM, Jiang H, Semenciw R and Band PR 'First analysis of mortality and occupational radiation exposure based on the National Dose Registry of Canada' (1998) 148(6) *American Journal of Epidemiology* 564–74.

protection standard could be determined.<sup>52</sup> This hypothesis resulted in the establishment of the National Registry for Radiation Workers (NRRW).<sup>53</sup> The NRRW commissioned further studies in 1992,<sup>54</sup> 1999,<sup>55</sup> and the most recent analysis published in 2009.<sup>56</sup> This latest report observed a small increase in some types of cancers with increasing exposure to radiation among nuclear industry workers. Surprisingly enough, the study also revealed that when compared to the UK's general population, atomic industry workers had a higher life expectancy and a healthier lifestyle. This observation could be explained by what is called a 'healthy worker effect', where working groups will often be in better health than the general population because those who are chronically ill are less likely to be employed. The authors concluded that 'the analysis provided accurate up to date estimates of the risks of cancer and mortality incidence following occupational radiation exposure', which strengthens the evidence for increased risks due to radiation exposures.

Canada commissioned the first study on nuclear industry workers, conducted by Atomic Energy of Canada Limited (AECL).<sup>57</sup> This study monitored the health of atomic industry workers between 1956 and 1980. Several years later, the NDR commissioned studies that covered more than 200 000 workers, which included nuclear industry workers and other employees from various sectors working with ionised radiation (medical, dental). These studies differed from the analysis of the mortality rate among



---

<sup>52</sup> Dont Nuke The Climate - Dont Believe The Myths About Nuclear, <https://redgreenlabour.org/dont-nuke-climate-beware-nuclear-myths/> (accessed September 27, 2018).

<sup>53</sup> Wakeford R 'Nuclear worker studies: Promise and pitfalls' (2014) 110(1) *British Journal of Cancer* 1–3.

<sup>54</sup> Kendall GM, Muirhead CR, MacGibbon BH, et al 'Mortality and occupational exposure to radiation: First analysis of the National Registry for Radiation Workers' (1992) 304 *British Medical Journal* 220–225; First analysis of the National Registry for Radiation Workers: Occupational exposure to ionising radiation and mortality

<sup>55</sup> Muirhead CR, Goodill AA, Haylock RGE et al 'Occupational radiation exposure and mortality: Second analysis of the National Registry for Radiation Workers' (1999) 19 *European Journal of Radiology* (19) 3–26.

<sup>56</sup> Muirhead CR, O'Hagan JA, Haylock RGE, et al 'Mortality and cancer incidence following occupational radiation exposure: Third analysis of the National Registry for Radiation Workers' (2009) *British Journal of Cancer* (100) 206–212.

<sup>57</sup> Gribbin MA, Weeks JL & Howe GR 'Cancer mortality (1956–1985) among male employees of Atomic Energy of Canada Limited with respect to occupational exposure to external low-linear-energy-transfer ionizing radiation' (1993) 133 *Journal of Radiation Research* (3) 375–380.

radiation workers<sup>58</sup> to the incidence of cancer in radiation workers.<sup>59</sup> The most recent review by the NDR published in 2004<sup>60</sup>, consisted of 45 468 workers monitored for more than one year between 1957 and 1994. The authors of this study concluded that while there was no new evidence of increased risk, the observed risk corresponded with the baseline estimates for radiation protection standards within the nuclear industry.

Consequently, the international community recognised that working within the nuclear industry came with severe occupational health risks. Also, the use of international collaboration would increase the significance of studying the impact of occupational radiation exposure on the health of nuclear industry workers.

The International Agency for Research on Cancer (IARC) coordinated such collaboration in 1988.<sup>61</sup> Its first publication was in 1995 and involved three countries USA, UK and Canada.<sup>62</sup> The combined analysis of the data presented by the three countries showed significant leukaemia mortality risk<sup>63</sup> when exposed to low dose-ionising radiation from external occupational sources.

There are a lot of scientific publications about the risk associated with exposure to ionised radiation, but very few about their right to the highest attainable standard of health of those exposed to ionised radiation. As stated earlier, the right to health is dependent on primary determinants such as nutritious food, access to potable water,

---

<sup>58</sup> Ashmore JP & Grogan D 'The National Dose Registry for radiation workers in Canada' (1985) 11 *Radiation Protection Dosimetry* (2) 95–100; Ashmore JP, Sont WN, Davies BF 'Analysis of medical workers' dose records from the Canadian National Dose Registry' (1991) 36 *Radiation Protection Dosimetry* (2) 79–83; Ashmore JP et al. (1998) 148 *American Journal of Epidemiology* (6) 564–74.

<sup>59</sup> Fair ME 'Record linkage in the National Dose Registry of Canada' (1997) 33 *European Journal of Cancer* (Suppl) S37 S43; Ashmore JP, Krewski D & Zielinski JM 'Protocol for a cohort mortality study of occupational radiation exposure based on the National Dose Registry of Canada' (1997) 33 *European Journal of Cancer* 10–21.

<sup>60</sup> Zablotzka LB, Ashmore JP & Howe GR 'Analysis of mortality among Canadian nuclear power industry workers after chronic low-dose exposure to ionizing radiation' (2004) 161(6) *Journal of Radiation Research* (6) 633–41.

<sup>61</sup> Wakeford R. Nuclear worker studies: promise and pitfalls. *British Journal of Cancer*. 2014 Jan 7;110(1):1-3.

<sup>62</sup> Cardis E, Gilbert ES, Carpenter L, et al 'Effects of low doses and low dose rates of external ionizing radiation: Cancer mortality among nuclear industry workers in three countries' (1995) 142 *Journal of Radiation Research* (2) 117–132.

<sup>63</sup> Excluding chronic lymphocytic leukaemia

housing, and an environment that is healthy.<sup>64</sup> Article 12(1) of the International Covenant on Economic, Social and Cultural Rights (ICESCR) provides that every human being is entitled to enjoy the highest attainable standard of health conducive to living a life in dignity. To achieve the full realisation of this right, the ICESCR recognises that the right to health requires the State “to ensure availability and accessibility of quality health facilities, goods and services”,<sup>65</sup> without being subjected to the limitation of progressive realisation. This right includes access to information that equips individuals to make decisions about their health.

A Greenpeace Report entitled *True Cost of Nuclear Power in South Africa*<sup>66</sup> has highlighted that numerous workers in the South African nuclear industry claim to have never been educated about the risks associated with radiation contamination and chemical exposure, nor given safety training or protective clothing. Unskilled workers, particularly, were not informed about the risk associated with radioactive substances. Subsequently, the South African nuclear industry retrenched these workers before falling seriously ill.<sup>67</sup> Many are still suffering as a consequence of working for the nuclear industry and continue to fight for rightful compensation. This is according to Mashile Phalane from Earthlife Africa, the organisation that first investigated the plight of nuclear industry workers, and represented 500 sick former ex-employees at the Pelindaba nuclear facility who claimed their illnesses were as a result of occupational radiation and chemical exposure.<sup>68</sup> As a result, other atomic industry workers at the Vaalputs nuclear waste dump and the Koeberg nuclear power station have sought clarity on the cause of their illnesses.<sup>69</sup> Today, however, many nuclear workers are reluctant to come forward fearing that they may lose their jobs.<sup>70</sup> The few who are legally challenging the nuclear industry for compensation live in fear that their health

---

<sup>64</sup> UN ICESCR, ‘Treaty Series General Comment 14’ (2000), E/C.12/2000/4, para 11 available at <http://www.refworld.org/docid/3ae6b36c0.html> (accessed 15 December 2018).

<sup>65</sup> UN ICESCR, ‘Treaty Series General Comment 14’ (2000), E/C.12/2000/4, para 12.

<sup>66</sup> Teule R (ed) ‘The true cost of nuclear power in South Africa’ in Teule R (ed) *Greenpeace Report* (2011) 20.

<sup>67</sup> Teule R (ed) *Greenpeace Report*, (2011) 20.

<sup>68</sup> Phalane, M. ‘Pelindaba workers’ representatives say Nuke’s chief misled parliamentary committee despite report on illnesses afflicting former employees’ *The Sowetan* 26 March 2007.

<sup>69</sup> Teule R (ed) *Greenpeace Report* (2011) 20.

<sup>70</sup> Teule R (ed) *Greenpeace Report* (2011) 20.

will fail and with that, the 'problems' they are creating will also fail against the nuclear industry in South Africa.

## **1.8 Conclusion**

Chapter 1 of this study has highlighted research on the impact of ionised radiation on the health of the peoples exposed to it. In doing so, the Chapter briefly stated how this research paper would contribute to the understanding of the consequence associated with exposure to ionised radiation in South Africa. Chapter 2 will focus on analysing the international legal protection afforded to people exposed to occupational ionised radiation. Chapter 3 will explain the domestic legal protection provided to those exposed to occupational ionised radiation in South Africa. It will examine the legislation and policies governing the nuclear matters, within the context of economic, social and cultural rights (focusing primarily on the right to health) and will include a discussion on their interpretation and efficacy. Chapter 4 will examine the obligations of the national nuclear regulator. This chapter will conclude by reflecting on some of the lessons learned from the Fukushima nuclear accident on how the South African government can ensure the protection of the right to the highest attainable standard of health in the nuclear industry. Chapter 5 will be the concluding chapter of this study, with the recommendations and findings of this study summarised.

UNIVERSITY of the  
WESTERN CAPE



## CHAPTER 2: INTERNATIONAL LEGAL PROTECTION AND ANALYSIS

### 2.1 Introduction

The International Commission on Radiological Protection (ICRP)<sup>71</sup> consist of an autonomous body of experts in the field of radiation not affiliated with any governmental structure, protects nuclear disaster victims. The purpose of ICRP is to establish principles and make recommendations incorporated in the national governance framework that regulates the protection of nuclear workers and the general public from radiation exposure.<sup>72</sup> These principles and recommendations integrate into the IAEA's Basic Safety Standards for Radiation Protection; Which is jointly published with the International Labour Organisation (ILO), OECD Nuclear Agency (NEA) and the World Health Organisation (WHO).<sup>73</sup>

The United Nations formed an intergovernmental body the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) which was “directed to assemble, study and disseminate information on observed levels of ionising radiation and radioactivity (natural and man-made) in the environment, and on the effects of such radiation on man and the environment”.<sup>74</sup>

However, all these institutions lack the power to translate principles and recommendations into legal limits and regulatory structures.

In international law, several treaties offer some protection for nuclear disaster victims, such as, the Act on Special Measures Concerning Nuclear Emergency Preparedness, which provides in Article 15(2):

---

<sup>71</sup> ICRP Symposium On The International System Of Radiological Protection <http://www.icrp.org/docs/ICRP%202011%20Symposium%20First%20Announcement.pdf> (accessed September 29, 2018).

<sup>72</sup> Clarke R & Valentin J 'A history of International Commission on Radiological Protection' (2005) (June) 88(6) *Health Physics*. 717–32.

<sup>73</sup> Clarke R & Valentin J (2005) 717–32.

<sup>74</sup> Clarke R & Valentin J (2005) 717–32.

When there has been a report or submission under the provision..., the Prime Minister shall immediately give public notice of the occurrence of a nuclear emergency ...<sup>75</sup>

This provision is the first step in containing a nuclear incident and protecting individuals from the health risks associated with a high dose of ionised radiation.

The Convention on Nuclear Safety (CNS) and the Convention on Early Notification of a Nuclear Accident express the right of nuclear disaster victims to be notified about a nuclear incident. Article 16(2) of the CNS provides that:

Each Contracting Party shall take the appropriate steps to ensure that, insofar as they are likely to be affected by a radiological emergency, its own population and the competent authorities of the States in the vicinity of the nuclear installation are provided with appropriate information for emergency planning and response.<sup>76</sup>

Both these provisions fail to specify the nature of what is considered to be “appropriate information” to be shared with nuclear disaster victims. Therefore, an individual’s right to access to information is not adequately protected.

The Convention on Assistance in the Case of Nuclear Accident or Radiological Emergency obligates State parties to collaborate with the IAEA in the event of a nuclear incident to lessen the effects of radiation and protect life, property and the environment.<sup>77</sup>

This provision fails to specify what to do with the victims of a nuclear accident when evacuating contaminated areas.

---

<sup>75</sup> Act on Special Measures Concerning Nuclear Emergency Preparedness 156 of 1999 Article 15(2) (Japan).

<sup>76</sup> 1963 UNTS 293; S. Treaty Doc. No. 104-6 (1995); 33 ILM 1514 (1994) available at <https://www.iaea.org/publications/documents/infcircs/convention-nuclear-safety> (accessed 29 September 2018); Convention on Early Notification of a Nuclear Accident (1986) available at <https://www.iaea.org/topics/nuclear-safety-conventions/convention-early-notification-nuclear-accident> (accessed 29 September 2018).

<sup>77</sup> Convention on Assistance in the Case of Nuclear Accident or Radiological Emergency (1986) available at <https://www.iaea.org/topics/nuclear-safety-conventions/convention-assistance-case-nuclear-accident-or-radiological-emergency> (accessed 29 September 2018).

Fortunately, there are regulations in international human rights law on the protection of displaced individuals, which undoubtedly apply to nuclear disaster victims. The Guiding Principles on Internal Displacement (which were adopted by the UN Commission on Human Rights) which seek to “identify the rights and guarantees relevant to the protection of persons from forced displacement and to their protection and assistance during displacement as well as during return or resettlement and reintegration”.<sup>78</sup> Although this instrument is non-binding, it is in line with international human rights regulations.

Therefore, an examination of international human rights law would possibly yield binding principles as well as broaden the scope of protection for nuclear disaster victims.

The United Nations General Assembly (UNGA)<sup>79</sup> adopts human rights conventions that significantly contribute to the state of human rights and humanitarian affairs of its members. The States who are signatories to UN Human Rights conventions must respect, fulfil and protect the natural rights of the individual; such as the rights to life, liberty, property, security and happiness,<sup>80</sup> and other specific rights such as civil, political, social, economic and cultural rights.

This chapter highlights the importance of the right to health as it relates to nuclear disaster victims by examining the International Covenant on Economic, Social and Cultural Rights and the African Charter.

---

<sup>78</sup> UN High Commissioner for Refugees (UNHCR), *Guiding Principles on Internal Displacement*, 22 July 1998, ADM 1.1, PRL 12.1, PR00/98/109, available at <http://www.refworld.org/docid/3c3da07f7.html> (accessed 29 September 2018). The introduction of The Guiding Principles on Internal Displacement.

<sup>79</sup> The General Assembly is one of the six main organs of the United Nations, the only one in which all Member 193 States have equal representation in terms of one nation, one vote. All Member States of the UN are represented in this unique forum to discuss and work together on a wide array of international issues covered by the UN Charter, such as development, peace and security, and international law.

<sup>80</sup> Nowak, M *Introduction to the International Human Rights Regime* (2003).

## 2.2 International Covenant on Economic, Social and Cultural Rights (ICESCR)

The ICESCR is one of the nine core United Nations (UN) human rights treaties that form part of the International Bill of Human Rights. “The ICESCR was adopted by General Assembly Resolution 2200 A (XXI) of 16 December 1966. The Covenant reflects the commitments adopted after World War II; to promote social progress and better standards of life, reaffirming faith in human rights and employing the international machinery to that end.”<sup>81</sup> The ICESCR is legally binding international human rights treaty that imposes international obligations on those countries that have ratified it. As of July 2018, 168 countries are participants to the ICESCR treaty, which reflects the international agreement on the universal human rights standards that apply to economic, social and cultural rights.<sup>82</sup>

The Committee on Economic, Social and Cultural Rights (CESCR) prescribes three types of obligations on state parties to guarantee the full realisation of economic, social and cultural rights.<sup>83</sup>

The commitment to respect requires State parties to not interfere with the enjoyment of these rights, whether directly or indirectly.<sup>84</sup> The obligation to protect requires state parties to take necessary steps to prevent third parties from interfering with the guarantees held under the ICESCR, such as the right to the highest attainable standard of health; commonly referred to as the “right to health”.<sup>85</sup>

The obligation to fulfil requires state parties to adopt legislation that is suitable, administrative, financially sound, legal and promotional towards the full realisation of

---

<sup>81</sup> International Covenant on Economic, Social and Cultural Rights (adopted 16 Dec. 1966, GA Res. 2200 (XXI), 21 UN GAOR Supp. (No. 16) at 49, UN Doc. A/6316 (1966), 993 UNTS 3, (*entered into force* 3 Jan. 1976).

<sup>82</sup> United Nations 993 ‘Treaty Series’, 3; depositary notification C.N.781.2001.Treaty – 6 of 5 October 2001 available at [https://treaties.un.org/Pages/ViewDetails.aspx?src=IND&mtdsg\\_no=IV-3&chapter=4&clang=en](https://treaties.un.org/Pages/ViewDetails.aspx?src=IND&mtdsg_no=IV-3&chapter=4&clang=en) (accessed 17 July 2018).

<sup>83</sup> UN Committee on Economic, Social and Cultural Rights (CESCR). Hereafter referred to as ‘the Committee’.

<sup>84</sup> UN (ICESCR) ‘General Comment No. 14: The right to the highest attainable standard of health’ (August 2000) UN Doc. E/C.12/2000/4 Article 12 para 34, 11.

<sup>85</sup> UN (ICESCR) ‘General Comment No. 14: The right to the highest attainable standard of health’ (2000) U.N. Doc. E/C.12/2000/4 Article 12 para 35.

economic, social and cultural rights.<sup>86</sup> The obligation to fulfil is especially significant in the event of a nuclear incident where the effects of ionised radiation exposure are immense and long-lasting. State parties should guarantee that health goods and services needed to mitigate the effects of ionised radiation are stable, available and accessible to nuclear disaster victims.

The obligation of a State to ensure the realisation economic, social and cultural rights, such as the right to health, was demonstrated by the most recent nuclear accident to date at the Fukushima nuclear power plant, which took place in Japan, 2011. This accident led to a high level of radioactive materials spilling throughout the surrounding residential areas. The Japanese government had an obligation to safeguard the rights of the general public without discrimination based on gender, nationality, culture and disability; nor could they discriminate based on the suburbs evacuated.

Soon after a destructive force caused by an earthquake and tsunami had struck the Daiichi nuclear power plant, the State of Japan announced a Nuclear Emergency Situation. It was the first step in containing the nuclear accident and protecting its citizens from the potential harm associated with ionised radiation.<sup>87</sup> In an emergency, access to information is crucial to ensure the right to health. The information enables nuclear disaster victims to make informed decisions regarding their health.<sup>88</sup> The IAEA safety regulations stipulate that a report must be provided to the public immediately in a coordinated manner, and it must be truthful and consistent throughout the nuclear emergency.<sup>89</sup>

According to the independent investigating committee<sup>90</sup>, and in contradiction of the IAEA requirements for nuclear emergency response,<sup>91</sup> on the day of the Fukushima

---

<sup>86</sup> UN (ICESCR) 'General Comment No. 14: The right to the highest attainable standard of health' (August 2000) UN Doc. E/C.12/2000/4 Article 12, para 36, 11.

<sup>87</sup> Grover A (2012) para 14 p7.

<sup>88</sup> The information provided to the public must include the nature of the disaster as well as the affected or potentially affected areas.

<sup>89</sup> IAEA *Leadership and Management for Safety* Safety Standards Series No.GS-R-2 (2002) available at <https://www-pub.iaea.org/MTCD/Publications/PDF/Pub1750web.pdf> (accessed 15 December 2018).

<sup>90</sup> Investigation Committee of the Accident at Fukushima Nuclear Power Stations of Tokyo Electric Power Company, Executive Summary of the Final Report (23 July 2012) 11.

<sup>91</sup> IAEA Safety Standards GS-R-2 25.

nuclear accident, 11 March 2011, only 20 per cent of the residence near the Daiichi power station were informed about the pending disaster.

Further investigations by the committee revealed that the evacuation zones, selected by the State of Japan were derived from the proximity to the nuclear power station and not on any scientific analysis of available data indicating areas most likely contaminated.<sup>92</sup>

In an emergency, the right to health requires the State to be attentive to the needs of vulnerable groups (sick, homeless, elderly, children and pregnant women). The Fukushima authorities initiated medical check-up on children who were 18 years and younger. However, during his visit to Japan, Anand Grover, the UN Special Rapporteur learned that the parents of those children had difficulties accessing the results of the medical examinations.<sup>93</sup> Confidentiality is an essential aspect of the right to health, but it must not be an obstacle that prevents parents from obtaining information about the health of their children, especially after exposure to a harmful pollutant such as ionised radiation.<sup>94</sup> The State of Japan had an obligation to ensure that the parents of the children exposed to ionised radiation are well informed about the expected health consequences relating to the health of their children by permitting them access to all medical records, concerning the future of those children, in compliance with the right to health.

The right to health is not limited to the provision of health goods and services; it extends to the environment, which is an enabling factor to the realisation of this right. The State of Japan had an obligation to minimise the strain and apprehension caused by the fear of possible exposure to radiation and separation from family members.<sup>95</sup> The physical and mental health of nuclear disaster victims, especially that of children, was affected by the lack of outdoor activities and monitored restricted movement. In keeping with the right to health, the State of Japan had a responsibility to provide support programmes<sup>96</sup> to minimise the stress and anxiety of affected individuals.

---

<sup>92</sup> Grover A (2012) para 17 p 8.

<sup>93</sup> Grover A (2012) para 32 p 12.

<sup>94</sup> This principle applies to all individuals, not only children.

<sup>95</sup> Grover A (2012) para 39 p 14.

<sup>96</sup> Recuperation camps organised by NGS's

The State of Japan's emergency response preparedness in the event of a nuclear accident did not meet up to the requirements of the IAEA safety standards.<sup>97</sup> As a result, the Fukushima nuclear accident infringed upon the right to health of workers, residents and evacuees alike, particularly pregnant women, older persons and children.<sup>98</sup>

### 2.2.1 The right to health expressed in the ICESCR

In the aftermath of the Fukushima accident, medical records stated that only 167 employees had exposure to ionised radiation higher or equal to 100mSv, a level known to exacerbate the risk of cancer.<sup>99</sup> In contrast, the 2012 Tokyo Electric Power Company (TEPCO) reported that more than 24 000 subcontract employees were hired and most likely exposed to ionised radiation during the Fukushima power plant clean-up and decontamination phases.<sup>100</sup> Many of these subcontract workers were poor, and some were homeless, accepting work in a dangerous environmental condition out of necessity. When subcontract workers reached their radiation exposure level (50mSv), they were supposed to be assigned to another post with less radiation. However, a more common practice was to retrench them as they were seen as expendable by the nuclear industry.<sup>101</sup>

Regrettably, when examining the reports coming out of the Fukushima nuclear accident, it appears that the State of Japan, concerning the right to health, failed to take the necessary measures to ensure an environment that did not worsen the poor quality of life of nuclear workers.

---

<sup>97</sup> Morris-Suzuki T, Boilley D, McNeill D & Gundersen A *et al* 'Lessons from Fukushima' (2012) 19. Insufficient training in the response system and poor coordination between authorities resulted in 573 nuclear disaster-related deaths.

<sup>98</sup> Grover A (2012) para 18 p 8.

<sup>99</sup> NAIIC Executive Summary 9. The majority of the workers employed at the Fukushima nuclear plant were hired through subcontractors for a short period of time without any proper medical records or effective health monitoring in place.

<sup>100</sup> Hecht G 'Nuclear janitors: Contract workers at the Fukushima reactor and beyond' (2013) 11 *The Asia-Pacific Journal* 1(2) 2. Of the 24 000 subcontract workers half of them were hired under conditions that violate Japanese labour laws.

<sup>101</sup> Hecht G 'Nuclear Janitors: Contract workers at the Fukushima reactor and beyond' (2013) 11 *The Asia-Pacific Journal* 1(2) 2.

Article 12(1)<sup>102</sup> of the ICESCR is essential for the comprehension and implementation of the right to health. It proposes that there should be a measurable standard of living (in a harmonious environment) included within the interpretation of the concept of health. The Committee opined that the notion of 'highest standard of health' must take into account the number of resources available to the state as well as the standard of living of an individual (biological, social and economic prerequisites).<sup>103</sup> There are non-medical aspects beyond the bounds of the State that influence an individual's health. For this reason, Article 12(1) does not imply that the state must guarantee good health for everyone. The 'right to health' mainly expects State parties to ensure the adequate provision and access to healthcare in the event of sickness. The committee observed that the 'right to health' is interdependent on the realisation of other human rights, for example, the right to a safe and healthy working environment.<sup>104</sup> In the aftermath of the Fukushima accident, the devastation caused by the earthquake, tsunami, hydrogen explosion and residual ionised radiation continues to make the work environment unpredictable.

Article 12(2) of the ICESCR highlights other specific areas that need to be improved while striving for the realisation of the 'right to health'. In Article 12(2), the main spheres of ensuring the full realisation of the 'highest attainable standard of health' are defined in guidelines which were developed to direct the full realisation of this right.<sup>105</sup> These measures implicitly involve 'the right to a healthy environment'. States are obligated to reduce the harmful effects of the working environment by taking appropriate regulatory or monetary measures to ensure that its citizens may fully enjoy their right to health.<sup>106</sup>

---

<sup>102</sup> UN (ICESCR) (1966) Article 12(1) 'The States Parties to the present Covenant recognize the right of everyone to the enjoyment of the highest attainable standard of physical and mental health.'

<sup>103</sup> UN (ICESCR) 'General Comment No. 14: The right to the highest attainable standard of health' (11 August 2000), U.N. Doc. E/C.12/2000/4. Article 12 para 9, U.N. Doc. E/C.12/2000/4.

<sup>104</sup> UN (ICESCR) 'General Comment No. 14: The right to the highest attainable standard of health' (11 August 2000), U.N. Doc. E/C.12/2000/4 Article 12 para 3, UN Doc. E/C.12/2000/4.

<sup>105</sup> ICESCR (1966) Article 12(2)(b) 'The steps to be taken by the States Parties to the present Covenant to achieve the full realisation of this right shall include those necessary for: The improvement of all aspects of environmental and industrial hygiene.'

<sup>106</sup><sup>106</sup> UN (ICESCR) 'General Comment No. 14: The right to the highest attainable standard of health' (11 August 2000) U.N. Doc. E/C.12/2000/4 Article 12 para 15.



The criteria listed (in the action list) in Article 12(2) help to define the obligations of the State and as well as those of the individual. State parties are obligated to have a healthcare system in place with specific institutional characteristics to attain progressively the full realisation of ‘the right to health’, which includes all the fundamental physical, psychological and environmental aspects of health.<sup>107</sup> These institutional characteristics of the ‘availability’, ‘accessibility’, ‘acceptability’ and ‘quality’ of healthcare goods and services are defined as follows:<sup>108</sup>

Availability means that state parties must have sufficient healthcare services and facilities to meet the needs of the country’s population. Acceptability means that services and facilities must be respectful of medical ethics and culturally appropriate as well as being designed to respect the confidentiality and improve the health status of those it serves. Accessibility to healthcare includes four dimensions, namely non-discrimination, physical accessibility, affordability and information accessibility. Quality means that services must be scientifically and medically appropriate and of good quality.<sup>109</sup>

Duties are imposed on state parties to “take whatever steps necessary to ensure that the right to the highest attainable standard of physical and mental health is enjoyed by all as soon as possible”.<sup>110</sup> A ‘person’ cannot claim ‘the right to be healthy’; instead, they can state that “I have a right to health, so do what is necessary to enable me to have health”.<sup>111</sup>

---

“Industrial hygiene refers to the minimisation, so far as is reasonably practicable, of the causes of health hazards inherent in the working environment”.

<sup>107</sup> UN (ICESCR) ‘General Comment No. 14: The right to the highest attainable standard of health’ (11 August 2000), U.N. Doc. E/C.12/2000/4. Article 12 para 4, The Committee reviewed the drafting history and express wording of Article 12(2) and concluded 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”.

<sup>108</sup> UN (ICESCR Report ‘General Comment No. 14: The right to the highest attainable standard of health’ (11 August 2000) UN Doc. E/C.12/2000/4. Article 12, para 12.

<sup>109</sup> UN (ICESCR) ‘General Comment No. 14: The right to the highest attainable standard of health’ (11 August 2000) UN Doc. E/C.12/2000/4. Article 12, para 12.

<sup>110</sup> UN (ICESCR) ‘General Comment No. 14: The right to the highest attainable standard of health’ (11 August 2000) U.N. Doc. E/C.12/2000/4. Art. 12. Para 33,

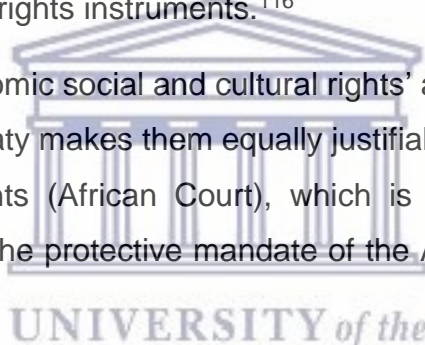
<sup>111</sup> Celkis P and Venckiene E *The Concept of the Right to Healthcare* (2011).

## 2.3 African Charter on Human Rights

The African Charter on Human and Peoples' Rights (also known as the Banjul Charter<sup>112</sup> and henceforth referred to as the African Charter) is the principal human rights instrument on the African continent.<sup>113</sup> The African Charter reflects the African concept of human rights, which is structured to demonstrate the African philosophy of law that is required to address the needs of the Continent.<sup>114</sup>

The preamble to the African Charter deviates from other human rights instruments by including all three generations of rights within one document.<sup>115</sup> It embodies the idea that all human rights are indivisible and interdependent, by protecting 'economic, social and cultural rights' together with 'civil and political rights' and 'collective rights'. The protection of civil and political rights start from Articles 2 to 15 of the African Charter, which covers what would be considered to be 'traditional' rights. These are provisions established in most human rights instruments.<sup>116</sup>

The inclusion of both 'economic social and cultural rights' and 'civil and political rights' within the same binding treaty makes them equally justifiable.<sup>117</sup> The African Court on Human and Peoples' Rights (African Court), which is the judicial mechanism of enforcement, complement the protective mandate of the African Charter by ensuring



---

<sup>112</sup> Organization of Unity (OAU), *African Charter on Human and Peoples' Rights (Banjul Charter)*, 27 June 1981, CAB/LEG/67/3 rev. 5, 21 I.L.M. 58 (1982), available at <http://www.refworld.org/docid/3ae6b3630.html> (accessed 21 August 2018). Hereafter known as the Charter.

<sup>113</sup> The African Union which strives for economic and political stability across the continent explicitly mentions the promotion and protection of human and peoples' rights in accordance with the African Charter and other instruments amongst its objectives. Accordingly, 53 of the 54 AU members have ratified the African Charter.

<sup>114</sup> AU *African Union: The AU in a nutshell* available at <https://au.int/en/au-nutshell> (accessed 17 August 2018).

<sup>115</sup> The 'first', 'second' and 'third' generation rights are divided respectively to correspond with civil and political rights, socio-economic rights and collective rights.

<sup>116</sup> Ewunetie N & Alemayehu A 'The distinctive feature of the African Charter' (2012) *Abyssinia Law* available at <https://www.abysinialaw.com/about-us/item/361-the-distinctive-feature-of-the-african-charter> (Accessed 28 August 2018).

<sup>117</sup> Yeshanew S A 'Approaches to the justiciability of economic, social and cultural rights in the jurisprudence of the African Commission on Human and Peoples' Rights: Progress and perspectives' (2011) 11(2) *African Human Rights Law Journal* (2) 371–340. Yeshanew (2011) states that '[t]he protection of economic, social and cultural rights and their subjection to adjudicatory enforcement by the African Commission means that the rights are justiciable'.

binding judgments.<sup>118</sup> Which strengthens the protection of 'economic, social and cultural rights' under the Charter. It also works together with and reinforces the functions of the African Commission on Human and Peoples' Rights (ACHPR).

The implementation of the right to health is dependent on the justiciability of economic, social and cultural rights. No other case has been more instrumental in the promotion of the justiciability of 'economic, social and cultural rights' than the *Social and Economic Rights Action Center (SERAC)* case.<sup>119</sup>

The Social and Economic Rights Action Center (SERAC) brought an argument in support of the people of Ogoniland opposing the Nigerian government to the African Commission on Human and Peoples' Rights (African Commission).<sup>120</sup> The SERAC alleged that the government had sanctioned and supported infringements against the Ogoni people through legal and military powers of the state at the convenience of the Shell Petroleum Development Corporation (SPDC).<sup>121</sup> The second claim was that the government did not monitor the operations of the SPDC nor did it, require safety measures that are standard procedure within the industry, which led to the exploitation of oil reserves in Ogoniland with no regard for the environmental degradation of the Ogoni region nor the health its people.<sup>122</sup>

This exploitation brought about widespread pollution through the disposal of toxic materials into the local environment and watercourses, which destabilised the food security of the region.<sup>123</sup> It also had serious implications for the Ogoni people in terms of their health, namely: "skin infections, gastrointestinal and respiratory ailments, increased risk of cancers, and neurological and reproductive problems".<sup>124</sup>

The government of Nigerian had failed to protect the inhabitants of Ogoniland against the negative impacts of oil production. Therefore, the African Commission being of the opinion that all human rights demand certain obligations (to protect, respect, promote

---

<sup>118</sup> OAU African Charter arts 60–61; African Court Protocol arts 3 & 7

<sup>119</sup> *The Social and Economic Rights Action Centre (SERAC) and the Centre for Economic and Social Rights v Nigeria* [2001] ACHPR Communication 155/96.

<sup>120</sup> *SERAC and Another v Nigeria* [2001] (SERAC case) (ACHPR, Communication 155/96).

<sup>121</sup> *SERAC and Another v Nigeria* [2001] ACHPR 60 para 3.

<sup>122</sup> *SERAC and Another v Nigeria* [2001] ACHPR 60 para 2 & 4.

<sup>123</sup> *SERAC and Another v Nigeria* [2001] ACHPR 60 para 1.

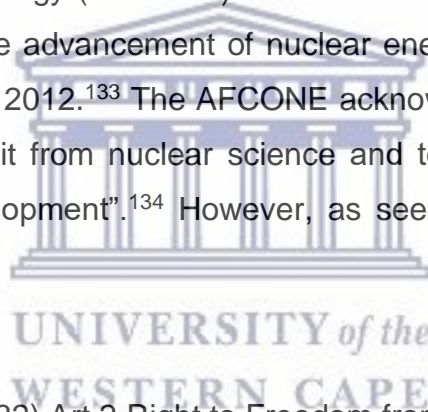
<sup>124</sup> *SERAC and Another v Nigeria* [2001] ACHPR 60 para 2.

and fulfil) from the States, found that the Nigerian government was in violation of Articles 2,<sup>125</sup> 4,<sup>126</sup> 14,<sup>127</sup> 16,<sup>128</sup> 18(1)<sup>129</sup>, 21<sup>130</sup> and 24<sup>131</sup> of the African Charter.

In this case, the African Commission was courageous in dealing substantively with the violations of 'economic, social and cultural rights' provisions of the African Charter. The commission showed its willingness to apply the rights within the Charter firmly and dynamically to ensure effective protection of 'economic, social and cultural rights' in Africa

### 2.3.1 The right to health in the African Charter

African states are interested in the development of nuclear power for the generation of electricity and desalination. These include Algeria, Egypt, Ghana, Kenya, Morocco, Namibia, Niger, Nigeria, Tunisia, South Africa, and Uganda.<sup>132</sup> In 2010, the African Commission on Nuclear Energy (AFCONE) was established by the African Union to manage and encourage the advancement of nuclear energy technology in Africa. It became fully operational in 2012.<sup>133</sup> The AFCONE acknowledged the right of African State parties to fully benefit from nuclear science and technology applications "for economic and social development".<sup>134</sup> However, as seen in the *SERAC* case, the



<sup>125</sup>OAU African Charter (1982) Art 2 Right to Freedom from Discrimination.

<sup>126</sup>OAU African Charter (1982) Art 4 Right to Life.

<sup>127</sup>OAU African Charter (1982) Art 14 Right to Property.

<sup>128</sup>OAU African Charter (1982) Art 16 Right to Health.

<sup>129</sup>OAU African Charter (1982) Art 18(1) Right to Protection of the Family and Vulnerable Groups. 'The family shall be the natural unit and basis of society. It shall be protected by the State which shall take care of its physical health and moral'.

<sup>130</sup>OAU African Charter (1982) Art 21 Right to Free Disposal of Wealth and Natural Resources.

<sup>131</sup>OAU African Charter (1982) Art 24 Right to a General Satisfactory Environment.

<sup>132</sup> Nuclear Energy Agency 'Impacts of the Fukushima Daiichi Accident on Nuclear Development Policies' (2017) ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT(OECD) 57. available at [https://inis.iaea.org/collection/NCLCollectionStore/\\_Public/48/058/48058392.pdf](https://inis.iaea.org/collection/NCLCollectionStore/_Public/48/058/48058392.pdf) (Accessed 8 September 2018).

<sup>133</sup> Nuclear Energy Agency (2017)p. 57.

<sup>134</sup> Treaty on the Nuclear-Weapon-Free Zone in Africa (Pelindaba Treaty) (1996) Art 9 (2) "As part of their efforts to strengthen their security, stability and development, the Parties undertake to promote individually and collectively the use of nuclear science and technology for economic and social development..."

African Commission holds that economic development should not occur at the expense of human rights.<sup>135</sup>

Article 16(1) of the African Charter provides that “every individual shall have the right to enjoy the best attainable state of physical and mental health”.<sup>136</sup> The general remarks about the interpretation of Article 16 are that it is very vague, as it does not define the content of ‘the right to health’; nor does it detail measures that member States must take for its adoption and implementation.<sup>137</sup> This vagueness could have been an attempt by the drafters to leave the comprehension of ‘the right to health’ open-ended, thus broadening its scope of implementation. Article 24<sup>138</sup>, when read together with Article 16, compels the State to refrain from any activities that threaten the health and environment of its citizens. However, the vagueness of Article 16 creates a lack of guidance in terms of a State’s obligations and therefore, of individual expectations, which has allowed some States to void its interpretation and implementation.<sup>139</sup> Nonetheless, the African Charter clearly articulates the responsibility of State parties to ‘respect’, ‘protect’ and ‘fulfil’ human rights.<sup>140</sup>

The obligation to respect requires States “to refrain from interfering directly or indirectly with the enjoyment of the right to health”.<sup>141</sup> This requirement should reflect some autonomy for the holders of these rights to use resources either owned or available without interference in any manner or form to satisfy their needs.<sup>142</sup>

---

<sup>135</sup> *SERAC and Another v Nigeria* [2001] AHRLR 60, para 54.

<sup>136</sup> OAU African Charter (1982) Art. 16(1). This focus on the individual and people’s rights is another representation of the indivisibility of human rights. ;

<sup>137</sup> Ssenyonjo, M, ‘Analysing the Economic, Social and Cultural rights jurisprudence of the African Commission: 30 years since the adoption of the African Charter’, (2011) 29 *Netherlands Quarterly of Human Rights* 3, 358–397, as cited by Van den Bossche M-C ‘Protection of the right to health through the human rights discourse in Africa of people in general and women in specific’ (2014) Faculteit Rechtsgeleerdheid Universiteit Ghent. Masters thesis.

<sup>138</sup> OAU African Charter (1982) Art 24 Right to a General Satisfactory Environment.(Which means a clean and safe environment),

<sup>139</sup> Coomans F ‘The Ogoni case before the African Commission on Human and Peoples’ Rights’ (2003) 52(3) *British iinternational & Comparative Law Quarterly* 749–760.

<sup>140</sup> UN (ICESCR) ‘Treaty Series General Comment No. 14: The right to the highest attainable standard of health’ (2000) para 33.

<sup>141</sup> UN (ICESCR)) ‘Treaty Series General Comment No. 14: The right to the highest attainable standard of health’ (2000) para 33.

<sup>142</sup> *SERAC and Another v Nigeria* [2001] ACHPR 60 para 45.

The obligation to protect human rights requires States “to take measures that prevent third parties from interfering with the enjoyment of the right to health”.<sup>143</sup> This requirement entails the creation and maintenance of a toxicity-free atmosphere governed by laws and regulations that would allow individuals to realise their rights freely.<sup>144</sup>

The obligation to fulfil insists upon the States to implement suitable “legislative, administrative, budgetary, judicial, promotional and other measures’ towards the full realisation of the right to health”.<sup>145</sup>

The African Charter has several shortcomings, just like other human rights instruments,<sup>146</sup> and in the wake of the Fukushima accident, in 2011, the justiciability and weaknesses of the protection of human rights, ‘especially economic, social and cultural rights’ within the Africa region, will be tested.

## 2.4 Conclusion

A nuclear accident has the potential to infringe upon ‘the right to health’ of workers, residents and evacuees alike, particularly pregnant women, older persons and children. International and regional human right conventions impose duties on state parties to “take whatever steps necessary to ensure that the right to the highest attainable standard of physical and mental health is enjoyed by all as soon as possible”.<sup>147</sup>

---

<sup>143</sup> UN (ICESCR) ‘Treaty Series General Comment No. 14: The right to the highest attainable standard of health’ (2000) para 33.

<sup>144</sup> *SERAC and Another v Nigeria* [2001] ACHPR 60 para 45.

<sup>145</sup> UN (ICESCR) Treaty Series General Comment No. 14: ‘The right to the highest attainable standard of health’ (2000) para 33.

<sup>146</sup> Ewunetie N & Alemayehu A ‘The distinctive feature of the African Charter’ (2012) available at <https://www.abbyssinialaw.com/about-us/item/361-the-distinctive-feature-of-the-african-charter>

<sup>147</sup> UN (ICESCR) ‘General Comment No. 14: The right to the highest attainable standard of health’ (11 August 2000) U.N. Doc. E/C.12/2000/4. Art. 12. Para 33.; Organization of Unity (OAU), *African Charter on Human and Peoples’ Rights (Banjul Charter)*, 27 June 1981, CAB/LEG/67/3 rev. 5, 21 I.L.M. 58 (1982), available at <http://www.refworld.org/docid/3ae6b3630.html> (accessed 21 August 2018). Hereafter known as the Charter.

The implementation of this right to health is dependent on the justiciability of 'economic, social and cultural rights'. It would be difficult to articulate a standardised implementation mechanism for the right to health that would be appropriate to all state parties. The idea is not to produce a plan of action, but to identify the various steps that are involved in building a consensus about 'the right to health'. This requires continuous negotiation because there are gaps between policy development and implementation; policy development looks better on paper, but the problems manifest during the implementation phase. State Parties must be allowed to develop their strategies for the fulfilment of 'the right to health'. There are constitutional commitments and backing in international law to support 'the right to health', but without the political will power of States, nothing will happen. Government bodies and community-based organisations must be extensively involved in the enrichment of the scope to realise 'the right to health', to ensure the full realisation of this right.



## CHAPTER 3: SOUTH AFRICAN LEGAL PROTECTION AND ANALYSIS

### 3.1 Introduction

The Constitution, 1996, does not have an all-encompassing right to health provision; however, all the components of 'the right to health' is protected by it. The Bill of Rights contains provisions that promote the full realisation of the right to health.<sup>148</sup> These provisions must be read together to comprehend fully the scope of protection awarded to 'the right to health'.

How nuclear energy is produced, distributed and used is a human rights issue because the methods of extraction and generation have been proved to have adverse impacts on atomic industry workers and the general public as and the surrounding environment.

Section 24(a) of the Constitution confers upon everyone in South Africa the right to an environment that is not harmful to health and wellbeing.<sup>149</sup> Section 24(b) confers upon everyone a right to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.<sup>150</sup>

Section 24 gives nuclear workers and the general public of South Africa the right to petition the state and the nuclear industry that they not be exposed to an environment that is detrimental to their health and wellbeing, in the process of nuclear energy generation.

The provisions in section 24 are reinforced by section 7<sup>151</sup> of the Constitution, 1996, which requires the state that it protects, promotes and fulfils the rights set out in the

---

<sup>148</sup> Pieterse M *Can rights cure? The impact of human rights litigation on South Africa's health system* (2014)18.

<sup>149</sup> The Constitution of the Republic of South Africa, 1996, section 24.

<sup>150</sup> The Constitution of the Republic of South Africa, 1996, section 24.

<sup>151</sup> The Constitution 1996, section 7: '(1) This Bill of Rights is a cornerstone of democracy in South Africa. It enshrines the rights of all people in our country and



Bill of Rights. In addition, section 24 understood in the context of section 36, allows for laws of general application to limit fundamental rights, to the extent that the limitation is reasonable and justifiable in an open and democratic society based on human dignity, equality and freedom.<sup>152</sup> It is permissible for national laws which meet these criteria to limit the rights established in section 24. This provision relates to the use of coal, which accounts for about 90 per cent of South Africa's electricity generation. Coal causes adverse health and environmental effects, which, unfortunately, cannot be rectified overnight. However, the country is exploring other methods of electricity generation such as nuclear and renewable energy, and in the implementation will be obliged to promote and fulfil the provisions stipulated under section 24.

### 3.2 The right to health in the Constitution, 1996

There have been numerous court cases that added to the normative content to the justiciability of 'economic, social and cultural rights'. This was clearly illustrated in the case *Government of the Republic of South Africa and Others v Grootboom and Others* (CCT11/00) [2000] ZACC 19; 2001 (1) SA 46; 2000 (11) BCLR 1169 (4 October 2000) (hereinafter referred to as the *Grootboom* case), in which the court issued a declaratory order requiring the state to implement 'economic, social and cultural rights' progressively within its available resources.<sup>153</sup> In this case, the court defined the considerations that constitute 'reasonable measures'.<sup>154</sup>

---

affirms the democratic values of human dignity, equality and freedom. (2) The state must respect, protect, promote and fulfil the rights in the Bill of Rights. (3) The rights in the Bill of Rights are subject to the limitations contained or referred to in section 36, or elsewhere in the Bill.'

<sup>152</sup> The Constitution 1996, section 36: '(1) The rights in the Bill of Rights may be limited only in terms of law of general application to the extent that the limitation is reasonable and justifiable in an open and democratic society based on human dignity, equality and freedom, taking into account all relevant factors, including— (a) the nature of the right; (b) the importance of the purpose of the limitation; (c) the nature and extent of the limitation; (d) the relation between the limitation and its purpose; and (e) less restrictive means to achieve the purpose. (2) Except as provided in subsection (1) or in any other provision of the Constitution, no law may limit any right entrenched in the Bill of Rights.'

<sup>153</sup> *Government of the Republic of South Africa and Others v Grootboom and Others* (CCT11/00) [2000] ZACC 19; 2001 (1) SA 46; 2000 (11) BCLR 1169 (4 October 2000) para 2 (S. Afr.)

<sup>154</sup> The Court concluded that measures that do not include or meet the needs of the most vulnerable groups in society are unreasonable.

Section 27 of the Constitution, 1996, is a well known health-related provision in the Bill of Rights. Section 27 provides for 'the right to access healthcare services' and covers a variety of health issues such as reproductive healthcare, primary healthcare for children, medical and emergency services for detained persons of interest and prisoners.<sup>155</sup> However, should a nuclear accident occur, the protection of the right to health of nuclear workers, the general public and the environment would most likely be prominent in section 24 of the Constitution, 1996, and not necessarily in section 27. The right to health under section 24 is enforced in its entirety and does not need to be inferred from other human rights.<sup>156</sup>

In section 24, the interpretation of 'health and wellbeing' is crucial in determining what is considered to be harmful.<sup>157</sup> The inclusion of both health and wellbeing indicates that they do not have the same meaning. Health in the context of section 24 refers to the mental and physical quality of life, which may be negatively impacted by adverse environmental conditions.<sup>158</sup> Wellbeing encompasses health, but the term is broader and more inclusive than health alone, it includes, but is not limited to, spiritual, cultural, religious and psychological concerns as well as anxiety or fear of a threat to the human environment.<sup>159</sup>

The significance of 'the right to health' in section 24 is conveyed by the inclusion of a clause that extends further than what is expressed in 'the right to access to health services' as articulated in section 27(1) of the Bill of Rights, which is limited to the provision of healthcare services. The existence of this health clause has implications

---

<sup>155</sup> The Constitution, 1996, section 27. Universal access is provided for in section 27 (1)(a) which states that: "Everyone has the right to have access to healthcare services, including reproductive healthcare." Section 27(2) provides for the state to "take reasonable legislative and other measures, within its available resources to achieve the progressive realisation of the right." Section 27(3) states that no one can be denied emergency medical treatment.

<sup>156</sup> This was clearly illustrated by the *Grootboom* case. socio-economic rights were widely considered judicially unenforceable prior to the *Grootboom* case because of 'democratic prerogatives and the limited nature of public resources'.

<sup>157</sup> Donald ME Advancing the constitutional goal of social justice through a teleological interpretation of key concepts in the environmental rights in section 24' (2014) (Unpublished LLM thesis Stellenbosch University).

<sup>158</sup> Donald ME (2014) (LLM Thesis Stellenbosch University).

<sup>159</sup> Du Plessis A 'South Africa's constitutional environmental right (generously) interpreted: What is in it for poverty?' (2011) 27 *South African Journal on Human Rights* 279–296.

on the interpretation of section 24. The concept of health in section 24 means more than access to healthcare services, considering the impact the environment has on the attainment of adequate living conditions and the promotion of good health.<sup>160</sup>

Section 24(a), for example, provides that “everyone has the right to an environment that is not harmful to their health or wellbeing”.<sup>161</sup> The articulation of this provision suggests that a particular environment may damage a person’s health, while not infringing on that person’s right to access healthcare services. Section 24(a) is violated when there is proof that the environment is damaging to the health or wellbeing of individuals. Therefore an objective standard to determine what exactly constitutes harm is needed to prevent inconsequential negative impacts qualifying as an infringement of section 24(a).<sup>162</sup> This provision does not clarify what exactly would constitute harm, but the requirement of no harm in itself does create a certain threshold for damage, which can be considered a violation.

Section 24(b) expects the three arms of government to employ ‘reasonable legislative and other measures’ to ensure environmentally sustainable development. What came out of the *Grootboom* case was that ‘reasonable legislative and other measures’ is to be determined with the knowledge that the Constitution, 1996, has different spheres of government, namely, national, provincial and local.<sup>163</sup> Responsibilities and tasks had to be allocated to all spheres of government to ensure appropriate human and financial resource support for the implementation of ‘reasonable measures’.<sup>164</sup> It is,

---

<sup>160</sup> Glazewski J ‘The Bill of Rights and environmental law’ in *Environmental Law in South Africa* (2000) 5–21; Feris LA & Tladi D ‘Environmental rights’ in *Brand D & Heyns C (eds) Socio-Economic Rights* (2005) 262; *Fuel Retailers v Director-General: Environmental Management* [2007] 6 SA 4 (CC) para 45. ‘Given the serious health consequences of air and water pollution and the siting of waste disposal sites, “health” is unarguably a component of environmental concern and thus falls within the ambit of section 24.’

<sup>161</sup> The Constitution, 1996.

<sup>162</sup> Kotzé LJ *The Constitutional Court’s Contribution to Sustainable Development in South Africa* (2003) 6(2) *PER/PEL* 81.

<sup>163</sup> *Grootboom* case [2000] (11) *BCLR* 1169 (CC).

<sup>164</sup> *Grootboom* case [2000] (11) *BCLR* 1171 (CC).

however, not entirely clear as to what these measures should entail, but they could be administrative, financial or educational.<sup>165</sup>

‘The right to the environment’ as expressed in section 24 has not been fully developed and fully clarified, which makes it difficult to enforce, especially when there are other competing human rights claims involved. Despite these limitations, section 24 plays a central role in the full realisation of ‘economic, social and cultural rights’.

### **3.3 The right to health inferred in national legislation and policies specific to the nuclear industry**

The Nuclear Energy Act 46 of 1999 (NEA), the National Radioactive Waste Disposal Institute Act 53 of 2008, the National Nuclear Regulator Act 47 of 1999 (NNRA) and the National Environmental Management Act 107 of 1998 (NEMA) governs the nuclear sector in South Africa. The DoE and the DEA administer these acts which are subject always to the authority of the Constitution, 1996.

The NEA governs authorised nuclear activities to ensure that safety is always adhered by eliminating or minimising nuclear incidents and deploying emergency measures during nuclear disasters to mitigate the impact of nuclear radiation on people, property, and the environment.<sup>166</sup> It also responsible for the establishment of the South African Nuclear Energy Corporation (NECSA); the establishment of a ministerial implementation committee responsible “for the application of the Safeguards Agreement and any additional protocols entered into by the State and the IAEA in support of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) acceded to by the State”; the establishment of ‘a governing system for the acquisition, possession, importation and exportation of nuclear fuel and equipment which comply with the international obligations of the State’; and the establishment of nuclear waste management standards.<sup>167</sup>

---

<sup>165</sup> Kotzé LJ ‘The judiciary, the environmental right and the quest for sustainability in South Africa: A critical reflection’ (2007) 16(3) *Review of European Community & International Environmental Law* 298–311.

<sup>166</sup> National Nuclear Regulator Act 47 of 1999 available at <http://www.nnr.co.za/> (accessed 16 June 2017).

<sup>167</sup> The preamble to the Nuclear Energy Act 46 of 1999 (NEA). Article 2 of NEA specifies the following objectives:

“(a) ensure uninterrupted supply of energy to the Republic;

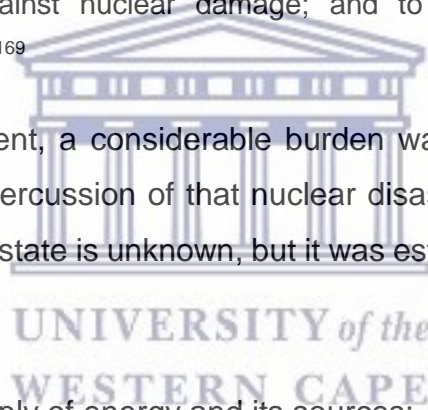
Another framework is the National Radioactive Waste Disposal Institute Act, which is responsible for the establishment of a National Radioactive Waste Disposal Institute to manage radioactive waste disposal on a national basis<sup>168</sup>

This section will focus on the National Nuclear Regulator Act 47 of 1999 and the National Environmental Management Act 107 of 1998. It is possible to distil certain principles from these two pieces of legislation, which are of particular significance concerning the right to health.

The National Nuclear Regulator Act (NNRA) states that its purpose is

to provide for the establishment of a National Nuclear Regulator in order to regulate nuclear activities, for its objects and functions, for the manner in which it is to be managed and for its staff matters; to provide for safety standards and regulatory practices for protection of persons, property and the environment against nuclear damage; and to provide for matters connected therewith.<sup>169</sup>

After the Fukushima accident, a considerable burden was placed on the people of Japan to cope with the repercussions of that nuclear disaster. The actual cost of the Fukushima accident on the state is unknown, but it was estimated to be approximately



- 
- (b) promote diversity of supply of energy and its sources;
  - (c) facilitate effective management of energy demand and its conservation;
  - (d) promote energy research;
  - (e) promote appropriate standards and specifications for the equipment, systems and processes used for producing, supplying and consuming energy;
  - (f) ensure collection of data and information relating to energy supply, transportation and demand;
  - (g) provide for optimal supply, transformation, transportation, storage and demand of energy that are planned, organised and implemented in accordance with a balanced consideration of security of supply, economics, consumer protection and a sustainable development;
  - (h) provide for certain safety, health and environment matters that pertain to energy
    - (i) facilitate energy access for improvement of the quality of life of the people of Republic;
  - (j) commercialise energy-related technologies;
  - (k) ensure effective planning for energy supply, transportation and consumption;
  - (l) contribute to sustainable development of South Africa's economy".

<sup>168</sup> Act 53 of 2008.

<sup>169</sup> National Nuclear Regulator Act 47 of 1999, preamble. available at <http://www.nnr.co.za/> (accessed 28 September 2018).

R280 billion as of March 2018.<sup>170</sup> Section 29(1) of the NNRA requires the state to classify all nuclear installations based on the potential consequences of a nuclear accident such as the Fukushima accident. Section 29(2) of the Act requires the state to determine: (i) “the level of financial security to be provided by holders of a nuclear installation...”,<sup>171</sup> and (ii) “the manner in which the financial security is to be provided....”<sup>172</sup> These provisions ensure that the holders of nuclear installation licences are fully accountable should a nuclear incident occur.<sup>173</sup> The Minister has a responsibility to determine the levels of financial security based on the recommendations of the NNR. “The levels of financial security were last determined by the Minister of Energy in May 2004 for the financial year 2004/2005”.<sup>174</sup> Failure by the Minister of Energy to continuously review the levels of financial security of nuclear installation licence holders could result in disastrous consequences for the people of South Africa should a nuclear incident occur.

The NNRA imposes an obligation on the state to guarantee to the citizens of South Africa adequate protection from possible irreparable harm that could be caused by a nuclear incident. Failure by the state to comply with the provision within this Act would make it liable for any irreparable damage that would be caused by the nuclear accident, which would potentially result in a gross violation of the ‘economic, social and cultural rights’ of atomic disaster victims. The devastating expenditure of a nuclear incident would significantly impede the ability of the state to protect, promote and fulfil any rights of atomic disaster victims within the state’s available resources.

---

<sup>170</sup> The Japanese Times ‘Estimated cost of Fukushima disaster might balloon to ¥218 billion’ available at <https://www.japantimes.co.jp/news/2018/03/24/national/estimated-taxpayer-cost-fukushima-nuclear-disaster-balloons-%C2%A5218-2-billion/#.W88rUh8zYdU> (accessed 23 October 2018).

<sup>171</sup> National Nuclear Regulator Act 47 of 1999. Section 29(2)(a)

<sup>172</sup> National Nuclear Regulator Act 47 of 1999. Section 29(2)(b)

<sup>173</sup> National Nuclear Regulator Act 47 of 1999. Section 30 provides that holders of nuclear licences are strictly liable for damage caused by their respective nuclear facilities

<sup>174</sup> O’Brien M ‘Founding affidavit in the High Court Of South Africa (Gauteng Division, Pretoria)’ (2015): Greenpeace Africa available at <https://cer.org.za/wp-content/uploads/2010/06/Greenpeace-founding-affidavit-2015-02-18-FINAL.pdf> (accessed 23 October 2018).

The levels of financial security have, since May 2004, not been updated or amended, notwithstanding the fact that the NNR has apparently made recommendations to the Minister to enable it to do so

The National Environmental Management Act (NEMA)<sup>175</sup> is a broad environmental legislative instrument that identifies national environmental management principles of all organs of state that may have a significant impact on the environment. Generating electricity using nuclear energy, is an activity with the potential to impact on the environment and the health of the people near a nuclear power plant and as such falls within the ambit of NEMA.<sup>176</sup> The principles in NEMA must be applied alongside all other suitable and relevant provisions, including the State's responsibility to 'respect', 'protect', 'promote' and 'fulfil' the social and economic rights enshrined in Chapter 2 of the Constitution, 1996.<sup>177</sup> Furthermore, NEMA requires environmental management to take into account the actual and potential impacts on the environment, socio-economic conditions, and cultural heritage.<sup>178</sup> NEMA states that environmental management must incorporate and acknowledge all aspects of the environment, and it must account for the impact of the decisions made on the environment including the people within the environment, by always selecting the best practicable environmental option available.<sup>179</sup> NEMA mandates that the State consider the socio-economic, cultural and environmental impacts that a nuclear accident could have in South Africa.

### 3.4 Conclusion

This chapter analysed South African domestic law and how it could offer some protection for atomic industry workers who exposed to occupational ionised radiation. The South African legal system (common law) does not provide constitutional guarantees regarding the right to health, but implicitly references the improvement of the quality of life for all citizens in the preamble of its Constitution (1996). Therefore, there is an obligation upon the state through 'reasonable legislative and other measures' to deal with nuclear matters, including nuclear accidents, in a manner that

---

<sup>175</sup> The National Environmental Management Act 107 of 1998.

<sup>176</sup> It is also a listed activity requiring environmental authorisation, if the capacity generated exceeds certain limits.

<sup>177</sup> Section 2 of NEMA.

<sup>178</sup> Section 23 of NEMA.

<sup>179</sup> Section 2(4)(b) of NEMA. The best practicable environmental option is defined in section 1 of NEMA as the option that provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term.

both prevents pollution and protects atomic industry workers and the general public as well as the surrounding environment.





## CHAPTER 4: NUCLEAR GOVERNANCE IN SOUTH AFRICA

### 4.1 Introduction

Nuclear-related activities in South Africa are mainly governed by two institutions, namely, NECSA and the NNR. NECSA is responsible for the expansion of nuclear science through the advancement of research in the field of nuclear technology.<sup>180</sup> The NNR is the custodian of public health in South Africa.<sup>181</sup> This section will focus on the NNR.

The NNRA establishes the NNR as “a juristic person to be known as the National Nuclear Regulator, comprising a board, a chief executive officer and staff...”<sup>182</sup> The NNR was established as a requirement of the CNS<sup>183</sup>, and it is responsible for “...the protection of persons, property and environment against nuclear damage...”<sup>184</sup> The NNR is intended to achieve the following objects:

- “The establishment of safety standards and regulatory practices which provide for the protection of persons, property and the environment against nuclear damage...”<sup>185</sup>
- The instituting of safety control through permitting nuclear authorisation based on the evaluation of “siting, design and construction, ‘operation, manufacture of parts, and decontamination, decommissioning and closure of nuclear installations...”<sup>186</sup>
- The enforcement of a system of “compliance inspections which is intended to provide assurance of compliance with the conditions of nuclear authorisations.”<sup>187</sup>

---

<sup>180</sup> Nuclear Energy Act 46 of 1999 section 13(a).

<sup>181</sup> The NNR has a board representative from a number of stakeholders, including government, industry, the community and trade unions.

<sup>182</sup> Section 3 of NNRA.

<sup>183</sup> 1963 UNTS 293; S. Treaty Doc. No. 104-6 (1995); 33 ILM 1514 (1994). Article 8.2 of the Convention requires ‘each Contracting Party’ to ‘take the appropriate steps to ensure an effective separation between the functions of the regulatory body and those of any other body or organisation concerned with the promotion or utilisation of nuclear energy’.

<sup>184</sup> National Nuclear Regulator Act 47 of 1999 section 5(a).

<sup>185</sup> Section 5(a) of the NNRA.

<sup>186</sup> Section 5(b) and (b)(i) of the NNRA.

<sup>187</sup> Section 5(d) of the NNRA.

- The fulfilment of “national obligations in respect of international legal instruments concerning nuclear safety”.<sup>188</sup>
- The creations of the nuclear emergency plan.<sup>189</sup>
- Acquiring finances in order to fulfil any nuclear obligation.<sup>190</sup>

Even though there are other commissions in South Africa managing other aspects of nuclear energy, the CNS requires that the NNR be independent while carrying out its functions. The NNR has to be an autonomous body that can discharge its mandate without unwarranted influence upon it. Firstly, the NNR must be financially independent. The NNR’s funding provision must consist out of funding procured from parliament,<sup>191</sup> fees collected during the application of a nuclear authorisation,<sup>192</sup> the annual nuclear authorisation payments,<sup>193</sup> and any other donation received by the NNR.<sup>194</sup>

Secondly, the NNR must maintain a professional relationship with the relevant Minister(s) since it is obligated to advise the Minister(s) on nuclear issues. The NNR comprises of the Board of Directors and a Chief Executive Officer who is appointed by the Minister to ensure that the NNR performs per requirements of the NNRA, the Reporting by Public Entities Act,<sup>195</sup> and the Public Finance Management Act (PFMA).<sup>196</sup> The NNR advises the Minister(s) on plans or regulations regarding nuclear issues such as the fees payable to the NNR in respect to the “...application of a nuclear authorisation”,<sup>197</sup> and the “...annual nuclear authorisation fee”,<sup>198</sup> the financial accountability of nuclear installation licence holder,<sup>199</sup> safety standards and regulatory practices,<sup>200</sup> and the regulations to ensure the effective implementation of any

<sup>188</sup> Section 5(e) of the NNRA.

<sup>189</sup> Section 5(f) of the NNRA.

<sup>190</sup> Section 29(2)(b) of the NNRA.

<sup>191</sup> Section 17(1)(a) of the NNRA.

<sup>192</sup> Section 28(a) of the NNRA.

<sup>193</sup> Section 28(b) of the NNRA.

<sup>194</sup> Section 17(1)(c) of the NNRA.

<sup>195</sup> Reporting by Public Entities Act 93 of 1992.

<sup>196</sup> Public Finance Management Act 1 of 1999.

<sup>197</sup> Section 28(a) of the NNRA.

<sup>198</sup> Section 28(b) of the NNRA.

<sup>199</sup> Section 29 of the NNRA.

<sup>200</sup> Section 36 of the NNRA.

applicable emergency plan,<sup>201</sup> to ensure fulfilment of South Africa's commitment to international and regional legal instruments concerning nuclear safety.<sup>202</sup>

## 4.2 Lessons learned from the Fukushima Accident

The first lesson the South African government should learn from the Fukushima Daiichi Nuclear Plant accident is that in the wake of a nuclear disaster, no country is ever fully prepared physically or financially to deal with the effects of nuclear radiation exposure. In the event of an emergency at a nuclear power plant, the area must be evacuated immediately irrespective of whether there are evacuation orders or not. Evacuation plans must be developed, and evacuation drills must be conducted to ensure their effectiveness should a nuclear accident occur. Japan was probably the best-prepared country in the world to face a natural disaster, yet it was unable to foresee the events that took place during the Fukushima nuclear accident. Due to a lack of emergency preparation.

The second lesson is that the nuclear regulator has to be an independent body. The Japanese nuclear regulator's close association with the government policy to endorse atomic energy and its intimate relationship with nuclear operators resulted in its failure to implement nuclear standards. This failure attributed partially to the Fukushima nuclear accident. Therefore, there is a need to establish strict structural and policy separation between nuclear safety regulators and the industry they regulate. The dichotomic objectives of the DoE to develop nuclear power and to regulate nuclear safety are closely intertwined. These are the same conditions observed in Japan's nuclear industry, where it was difficult to differentiate between the regulator and the regulated. This close relationship between the regulator and the Ministry of Economy, Trade and Industry (METI) and TEPCO created the circumstances for both institutions to fail in their respective mandates to be accountable for nuclear reactor safety.<sup>203</sup>

---

<sup>201</sup> Section 38(4) of the NNRA.

<sup>202</sup> Section 5(e) read with section 5(f) of the NNRA.

<sup>203</sup> Fig D 'In the dark – Seeking information about South Africa's nuclear energy programme' in Allan K (ed). *Paper Wars. Access to Information in South Africa* (2009) 82. The NNR reports to the Minister of Energy, who has been in favour of nuclear energy. This creates some conflicts of interest, which would be removed if the body were made more independent.

The third lesson is that a massive burden was placed on the Japanese citizens to cope with the consequences of that nuclear disaster. Many workers in South Africa were uninformed about the risks associated with working in the nuclear industry (radiation contamination and chemical exposure).<sup>204</sup> Today there are more than 500 seriously ill former workers at NECSA's Pelindaba complex who have sought occupational health compensation.<sup>205</sup> When a nuclear accident occurs, workers within the nuclear plant are expected to mitigate emergencies. The danger of this expectation is that it could violate their fundamental human rights. These workers need a reassurance that all their medical expenses will be covered long after they have retired. They must also have in possession a copy of their health record, that entitles them to follow-up check-ups as a matter of public responsibility. As more scientific evidence emerges about the health risks associated with ionised nuclear radiation, especially within the vicinity of nuclear power plants, greater civic participation must become part of the process when reviewing the risks associated with nuclear energy generation.



---

<sup>204</sup> Teule R (ed.) *Greenpeace Report*, (2011) 20.

<sup>205</sup> Phalane, M *The Sowetan* 26 March 2007.

<http://www.sowetanlive.co.za/sowetan/archive/2007/03/26/pelindaba-workers-representativessay-nukes-chief-misled-parliamentary-committee-despite-report-on-illnesses-afflicting-former-employees>

## CHAPTER 5: RECOMMENDATIONS AND CONCLUSION

### 5.1 Introduction

The 2011 Fukushima accident shifted the consensus about the social, economic and environmental safety of nuclear energy generation. Seven years after the Fukushima nuclear accident, South Africa's overall policy response to this nuclear accident remains uncertain. Despite public fears and concerns about the expansion of nuclear energy generation in the country, South Africa's nuclear and political authorities have no plans to phase out nuclear power generation.<sup>206</sup> South Africa's lack of policy response to the Fukushima accident appears to show its apathy toward the risks associated with nuclear energy generation. The NNR thinks that South Africa is well-prepared to handle any such atomic disaster.<sup>207</sup>

### 5.2 International conventions and treaties

The South African government has ratified numerous international and regional human rights treaties that recognise 'economic, social and cultural rights'. These international conventions and agreements are legal instruments that form a fundamental component in the protection of human rights in international nuclear energy laws. The most important aspect of these instruments is that they are the driving force behind domestic nuclear regulations.

### 5.3 Recommendations

At first, 'the right to health' is not limited to the provision of health goods and services; it extends to the environment which is an enabling factor in the realisation of this right as it has an impact on the attainment of adequate living conditions and the promotion of good health. There should be an emphasis on the obligation of the state to respect, protect and fulfil human rights through 'reasonable legislative and other measures' by dealing with nuclear matters, including nuclear accidents, in a manner that both prevents pollution and protects atomic industry workers and the general public as well

---

<sup>206</sup> Teule R (ed) *Greenpeace Report* (2011) 24.

<sup>207</sup> Article 14 of the South Africa 7th National Report on The Convention on Nuclear Safety (2016) available at <http://www.nnr.co.za/wp-content/uploads/2015/02/7th-CNS-Report-RSA.pdf> (Accessed 26 November 2018).

as the surrounding environment. In this regard, chapter nine of the constitution established institutions to “strengthen constitutional democracy” such as the Public Protector (PP) and the South African Human Rights Commission (SAHRC). “These institutions are intended to watch over the other organs of government, ensuring that their workings are made transparent and accountable to citizens and that the government embodies democratic and constitutional values”.<sup>208</sup> This study recommends that the South African legal system provide constitutional guarantees regarding the right to the highest attainable standard of physical and mental health and not merely reference the “improvement of the quality of life for all citizens” as it does in the preamble of its Constitution, 1996. It must implicitly impose duties on the state to ‘take whatever steps necessary to ensure that all enjoy the right to the highest attainable standard of physical and mental health’.

Secondly, CNS requires that NNR be autonomous from other bodies tasked with the advancement of nuclear power such as the DoE. However, there is no international operative mechanism to monitor compliance, let alone enforce these rules. “The magnitude of this problem is illustrated by the fact that the international community was unable to identify and reign in the collusion between the Japanese nuclear industry and its regulator”.<sup>209</sup> It is, therefore, the recommendation of this study that the NNR in its role as custodian of public health in South Africa is separated from the political control of the government departments that promote nuclear energy. It should be allowed to be an autonomous body that functions free from licensing fees for the bulk of its income and be able to carry out its mandate without undue influence imposed upon it. It also needs to revise its core competencies to ensure that its mandate to regulate nuclear activities is implemented.

Lastly, the DoE and the NNR need to become more accountable to the public and its elected representatives. It is, therefore, the recommendation of this study that nuclear

---

<sup>208</sup> The Southern African NGO Network’ The Role of the Chapter Nine Institutions: Have They Fulfilled Their Constitutional Mandate?’ available at <http://www.ngopulse.org/event/2015/09/28/role-chapter-nine-institutions-have-they-fulfilled-their-constitutional-mandate> (accessed 15 December 2018).

<sup>209</sup> Morris-Suzuki T *et al* ‘Lessons from Fukushima’ (2012) 45. Gundersen A ‘The Echo Chamber: Regulatory Capture And The Fukushima Daiichi Disaster’ (2012) <https://ratical.org/radiation/Fukushima/TheEchoChamber.html> (accessed July 30, 2019).

disaster victims and the general public, as well as civil society organisations, need to demand of these state bodies to take necessary legislative or other administrative measures to ensure that all enjoy the right to the highest attainable standard of health. Civil societies can monitor the interaction between the government and the international human rights bodies, and participate by submitting their counter reports to these bodies. The South African government needs to acknowledge nuclear and health recommendations provided by all interested and affected parties. Although these recommendations may not be binding, they are compelling interpretations of provisions within some of the international human rights treaties to which South Africa is a state party.

#### **5.4 Conclusion**

In conclusion, future studies should investigate whether the location of the nuclear power plants in South Africa aggravates the chances of ionised radiation exposure of vulnerable groups. The people who live near nuclear reactors are mostly poor and marginalised and are highly likely to be affected. The government must adopt a human rights-based approach when managing the nuclear industry. The State must ensure that disaster management plans do not discriminate or lead to discrimination in the enjoyment of the economic, social and cultural rights of all people.



UNIVERSITY *of the*  
WESTERN CAPE

## REFERENCES

### **Books**

- BEIR VII Phase 2. *Biological Effects of Ionizing Radiation: Health Risks from Exposure to Low Levels of Ionizing Radiation* (2006) Washington D.C.: National Academies Press
- Celkis P & Venckiene E *The Concept of the Right to Healthcare* (2011) Lithuania: Mykolas Romeris University, Faculty of Law, Department of Legal Philosophy and History.
- Glazewski J *Environmental Law in South Africa South Africa 2 ed* (2000) Durban: Lewis Nexis.
- Hassim A, Heywood M & Berger J *Health and Democracy: A Guide to Human Rights, Health Law and Policy in Post-Apartheid South Africa* (2007) Cape Town: Siber Ink.
- Nowak M *Introduction to the International Human Rights Regime* (2003) Leiden/Boston: Martinus Nijhoff Publishers.
- Pieterse M *Can rights cure? The impact of human rights litigation on South Africa's health system* (2014) Pretoria: Pretoria University Law Press (PULP).
- Schneider M Froggatt A Hazemann J Fairlie I Katsuta T Maltini F Ramana RV & Thomas S *The World Nuclear Industry Status Report 2016* (2016) Paris, London, Tokyo: Worldwatch Institute.

### **Chapters in Books**

- Feris LA & Tladi D 'Environmental rights' in Brand D & Heyns C (eds) *Socio-Economic Rights* (2005) Pretoria: Pretoria University Law Press (PULP).
- Fig D 'In the dark – Seeking information about South Africa's nuclear energy programme' in Allan K (ed). *Paper Wars. Access to Information in South Africa* (2009) Johannesburg: Wits University Press.
- Glazewski J 'The Bill of Rights and environmental law' in *Environmental Law in South Africa 2 ed* (2000) Butterworths, Durban: Lexis Nexis.



## **Journal Articles**

- Ashmore JP & Grogan D 'The National Dose Registry for radiation workers in Canada' (1985) 11 *Radiation Protection Dosimetry* (2) 95–100.
- Ashmore JP Krewski D & Zielinski JM 'Protocol for a cohort mortality study of occupational radiation exposure based on the National Dose Registry of Canada' (1997) 33 *European Journal of Cancer* (3) 10–21.
- Ashmore JP Krewski D Zielinski JM Jiang H Semenciw & R Band PR 'First analysis of mortality and occupational radiation exposure based on the National Dose Registry of Canada' (1998) 148 *American Journal of Epidemiology* (6) 564–74.
- Ashmore JP Sont WN & Davies BF 'Analysis of medical workers' dose records from the Canadian National Dose Registry'(1991) 36 *Radiation Protection Dosimetry* (2) 79–83.
- Barle LE Winkler GC Glowienke S Elhajouji A Nunic J & Martus H 'Setting occupational exposure limits for genotoxic substances in the pharmaceutical industry' (2016) 151 *Toxicological Sciences* (1) 2–9.
- Cardis E Gilbert ES Carpenter L Howe G Kato I Armstrong BK et al 'Effects of low doses and low dose rates of external ionizing radiation: Cancer mortality among nuclear industry workers in three countries' (1995) 142 *Radiation Research* (2) 117–132.
- Clarke R & Valentin J 'A history of the International Commission on Radiological Protection' (2005) (June) 88(6) *Health Phys.* 717–32.
- Coomans F 'The Ogoni case before the African Commission on Human and Peoples' Rights' (2003) 52 *British International & Comparative Law Quarterly* (3) 749–760.
- Cook-Mozaffari P Darby S, Doll R., Forman D Hermon C Pike M et al 'Geographical variation in mortality from leukaemia and other cancers in England and Wales in relation to proximity to nuclear installations, 1969-1978' (1989) 59 *British Journal of Cancer* 476–485.
- Du Plessis A 'South Africa's constitutional environmental right (generously) interpreted: What is in it for poverty?' (2011) 27 *South African Journal on Human Rights* 279–296.
- EngSeng C, Chee KL, Adam NG & Ngoc HLN 'The systems dynamics of nuclear energy in Singapore' 2015 12 *International Journal of Green Energy* 73–86.

- Forman D Cook-Mozaffari P Darby S Davey G Stratton E Doll R & Pike M 'Cancer near nuclear installations' 1987 *Nature (Lond.)* (329) 499–505.
- Fair ME 'Record linkage in the National Dose Registry of Canada' (1997) 33 *European Journal of Cancer* (3) (Suppl) S37 S43.
- Gardner M Snee M Hall A Powell C Downes S & Terrell J 'Results of case-control study of leukaemia and lymphoma among young people near Sellafield Nuclear Plant in West Cumbria' (1990) 300 *British Medical Journal* 423–429.
- Gribbin MA Weeks JL & Howe GR 'Cancer mortality (1956–1985) among male employees of Atomic Energy of Canada Limited with respect to occupational exposure to external low-linear-energy-transfer ionizing radiation' (1993) 133 *Journal of Radiation Research* (3) 375–80.
- Harvey L & Vakil C 'Human health implications of the nuclear energy industry' 2009 13 *Canadian Association of Physicians for the Environment (CAPE)* (4) 1–34.
- Hecht G 'Nuclear janitors: Contract workers at the Fukushima reactor and beyond' (2013) 11 *The Asia-Pacific Journal* 1(2) 2.
- Kotzé LJ *The Constitutional Court's Contribution to Sustainable Development in South Africa* (2003) 6(2) *PER/PEL* 81.
- Kotzé LJ 'The judiciary, the environmental right and the quest for sustainability in South Africa: A critical reflection' (2007) 16(3) *Review of European Community & International Environmental Law* 298–311.
- Kaatsch P Spix C Schulze-Rath R Schmiedel S & Blettner M 'Leukemia in young children living in the vicinity of German nuclear power plants' (2008) 1220 *International Journal of Cancer* 721–26.
- Kendall GM, Muirhead CR, MacGibbon BH, O'Hagan JA, Conquest AJ, Goodill AA, Butland BK, Fell TP, Jackson DA, Webb MA, Haylock RGE, Thomas JM and Silk TJ 'Mortality and occupational exposure to radiation: First analysis of the National Registry for Radiation Workers' (1992) 304 *British Medical Journal* 220–225.
- Muirhead CR, Goodill AA, Haylock RGE, Vokes J, Little MP, Jackson DA, O'Hagan JA, Thomas JM, Kendall GM, Silk TJ, Bingham D and Berridge GLC (1999) 19 'Occupational radiation exposure and mortality: Second analysis of the National Registry for Radiation Workers' *European Journal of Radiology* 3–26.

- Muirhead CR, O'Hagan JA, Haylock RGE, Phillipson MA, Willcock T, Berridge GLC and Zhang W 'Mortality and cancer incidence following occupational radiation exposure: Third analysis of the National Registry for Radiation Workers' (2009) 100 *British Journal of Cancer* 206–212.
- Nussbaum RH 'Childhood leukemia and cancers near German nuclear reactors: Significance, context, and ramifications of Recent Studies' (2009) 15 *International Journal of Occupational and Environmental Health* 318.
- Roxan A 'Why nuclear energy is not an answer to global warming' 2016 *IPPNW Germany* 6.
- Spix C Schmiedel S Kaatsch P Schulze-Rath R & Blettner M 'Case-control study on childhood cancer in the vicinity of nuclear power plants in Germany 1980-2003' (2008) 44 *European Journal of Cancer* 275–284.
- Wakeford R 'Nuclear worker studies: Promise and pitfalls' (2014) 110(1) *British Journal of Cancer* 1–3.
- Yeshanew S A 'Approaches to the justiciability of economic, social and cultural rights in the jurisprudence of the African Commission on Human and Peoples' Rights: Progress and perspectives' (2011) 11(2) *Yeshanew S A 'Approaches to the justiciability of economic, social and cultural rights in the jurisprudence of the African Commission on Human and Peoples'* 371.
- Zablotska LB Ashmore JP & Howe GR 'Analysis of mortality among Canadian nuclear power industry workers after chronic low-dose exposure to ionizing radiation' (2004) 161 (6) *Radiation Research* 633–41.

### **Newspapers and Periodicals**

- The Japanese Times 'Estimated cost of Fukushima disaster might balloon to ¥218 billion' available at <https://www.japantimes.co.jp/news/2018/03/24/national/estimated-taxpayer-cost-fukushima-nuclear-disaster-balloons-%C2%A5218-2-billion/#.W88rUh8zYdU> (accessed 25 March 2018)
- Phalane M 'Pelindaba workers' representatives say Nuke's chief misled parliamentary committee despite report on illnesses afflicting former employees' *The Sowetan* 26 March 2007 available at <http://www.sowetanlive.co.za/sowetan/archive/2007/03/26/pelindaba-workers->

[representatives-say-nukes-chief-misled-parliamentary-committee-despite-report-on-illnesses-afflicting-former-employees](#) (accessed 15 December 2018)

The Southern African NGO Network' The Role of the Chapter Nine Institutions: Have They Fulfilled Their Constitutional Mandate?' available at <http://www.ngopulse.org/event/2015/09/28/role-chapter-nine-institutions-have-they-fulfilled-their-constitutional-mandate> (accessed 15 December 2018)

## **Reports**

Black D *Investigation of Possible Increased Incidence of Cancer in West Cumbria* (1984) Report of the Independent Advisory Group HMSO London.

Clarke E McLaughlin J & Anderson T *Childhood Leukemia around Canadian Nuclear Facilities – Phase 1 and 2*. (1989/1991) A report prepared for the Atomic Energy Control Board Ottawa, Canada (Phase 1) May 1989 (Phase 2) June 1991. Ontario Cancer Treatment and Research Foundation: University of British Columbia.

Committee on Medical Aspects of Radiation in the Environment (COMARE) 17th Report *Further Consideration of the Incidence of Cancers around the Nuclear Installations at Sellafield and Dounreay* (2016) London: Department of Health.

Grover A *Report of the Special Rapporteur on the Right of Everyone to the Enjoyment of the Highest Attainable Standard of Physical and Mental Health* (2012) United Nations Human Rights Council A/HRC/23/41/Add 3 para 11.

International Atomic Energy Agency (IAEA) *Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards: General Safety Requirements* (2011) IAEA Safety Standards Series GSR Part 3 Vienna, Austria.

McLaughlin J Anderson T Clarke E & King W *Occupational Exposure of Fathers to Ionizing Radiation and the Risk of Leukemia in Offspring – A Case-control Study* (AECB Project No. 7.157.1). (A research report prepared for the Atomic Energy Control Board, Ottawa, Canada. (1992). Ontario Cancer and Treatment Foundation: University of Toronto, University of British Columbia.

Morris-Suzuki T, Boilley D, McNeill D & Gundersen A *et al* 'Lesson from Fukushima' (2012) Greenpeace International.

Schneider M Froggatt A Hazemann J Fairlie I Katsuta T & Maltini et al *The World Nuclear Industry Status Report 2016* (2016) Paris, London, Tokyo.

Teule R (ed.) 'The true cost of nuclear power in South Africa' in Teule R (ed.) *Greenpeace Report* (2011) Johannesburg: Greenpeace.

United Nations Report The Sustainable Development Goals (2016). New York: United Nations

### **South African Legislation**

Constitution of the Republic of South Africa (1996) (Department of Justice) Pretoria: Government Printer available at <https://www.gov.za/documents/constitution-republic-south-africa-1996> (accessed 10 June 2017).

National Environmental Management Act 107 of 1998 (NEMA) (Department of Environmental Affairs) Pretoria: Government Printer available at <https://www.environment.co.za/environmental-laws-and-legislation-in-south-africa/nema-south-africa-national-environmental-management-act-legislation-and-environmental-acts.html> (accessed 10 June 2017).

National Nuclear Regulator Act 47 of 1999 (NNRA) (Department of Minerals and Energy) Pretoria: Government Printer available at <http://www.nnr.co.za/> (accessed 16 June 2017).

National Radioactive Waste Disposal Institute Act 53 of 2008 (Department of Minerals and Energy) Pretoria: Government Printer available at [http://www.energy.gov.za/files/policies/act\\_nuclear\\_53\\_2008\\_NatRadioActWaste.pdf](http://www.energy.gov.za/files/policies/act_nuclear_53_2008_NatRadioActWaste.pdf) (accessed 16 June 2017).

Nuclear Energy Act 46 of 1999 (NEA) (Department of Minerals and Energy) Pretoria: Government Printer available at [http://www.energy.gov.za/files/policies/act\\_nuclear\\_46\\_1999.pdf](http://www.energy.gov.za/files/policies/act_nuclear_46_1999.pdf) (accessed 16 June 2017).

Public Finance Management Act 1 of 1999 (PFMA) (National Treasury) Pretoria: Government Printer.

Reporting by Public Entities Act 93 of 1992 (National Treasury) Pretoria: Government Printer.

## **Legislation of Other Countries**

Act on Special Measures Concerning Nuclear Emergency Preparedness 156 of 1999  
Article 15(2) (Japan)

## **Case Law**

### **South Africa**

*Fuel Retailers v Director-General: Environmental Management* [2007] 6 SA 4 (CC)  
para 45.

*Government of the Republic of South Africa and Others v Grootboom and Others*  
(CCT11/00) [2000] ZACC 19; 2001 (1) SA 46; 2000 (11) BCLR 1169 (4 October  
2000).

### **Europe**

*Marangopoulos Foundation for Human Rights (MFHR) v. Greece Ashanti Ltd*  
Complaint No. 30/2005 European Social Committee [2006].

### **African Commission**

*The Social and Economic Rights Action Centre (SERAC) and the Centre for Economic  
and Social Rights v Nigeria* [2001] ACHPR Communication 155/96.

### **White Paper**

*White Paper on the Energy Policy* of the Republic of South Africa Department of  
Mineral and Energy (GN 3007/1998 in GG 19606 of 17 December 1998).

## **Policy Documents**

### **South Africa**

*Integrated Resource Plan for Electricity 2010-2030* (Department of Energy) Pretoria:  
Government Printer available at  
[http://www.energy.gov.za/IRP/irp%20files/IRP2010\\_2030\\_Final\\_Report\\_201103\\_25.pdf](http://www.energy.gov.za/IRP/irp%20files/IRP2010_2030_Final_Report_201103_25.pdf) (accessed 10 May 2017).

*Nuclear Energy Policy* (2008) (Department of Energy) Pretoria: Government Printer  
available at

[http://www.energy.gov.za/files/policies/policy\\_nuclear\\_energy\\_2008.pdf](http://www.energy.gov.za/files/policies/policy_nuclear_energy_2008.pdf)

(accessed 16 June 2017).

South African Human Rights Commission *Annual International and Regional Report 2016*. (2016) Braamfontein: SAHRC.

### **International**

International Commission on Radiation Protection (ICRP) *Recommendations of the ICRP Document 60* (1990) Oxford, UK: Pergamon, Elsevier Science.

### **Miscellaneous Internet Sources**

1963 UNTS 293; S. Treaty Doc. No. 104-6 (1995); 33 ILM 1514 (1994) available at

<https://www.iaea.org/publications/documents/infcircs/convention-nuclear-safety>

(accessed 29 September 2018).

African Union 'The AU in a nutshell' available at <https://au.int/en/au-nutshell>

(accessed 17 August 2018).

Convention on Early Notification of a Nuclear Accident (1986) available at

<https://www.iaea.org/topics/nuclear-safety-conventions/convention-early-notification-nuclear-accident> (accessed 29 September 2018).

Council of Europe 'European Social Charter (Revised) 3 May 1996', ETS 163 available at <http://www.refworld.org/docid/3ae6b3678.html> (accessed 18 July 2018).

Don't Nuke The Climate - Don't Believe The Myths About Nuclear, <https://redgreenlabour.org/dont-nuke-climate-beware-nuclear-myths/> (accessed September 27, 2018).

Ewunetie N & Alemayehu A 'The distinctive feature of the African Charter' (2012)

Abyssinia Law available at <https://www.abysiniaw.com/about-us/item/361-the-distinctive-feature-of-the-african-charter> (accessed 28 August 2018).

Gundersen A 'The Echo Chamber: Regulatory Capture And The Fukushima Daiichi Disaster' (2012) <https://ratical.org/radiation/Fukushima/TheEchoChamber.html>

(accessed July 30, 2019).

ICRP Symposium On The International System Of Radiological Protection

<http://www.icrp.org/docs/ICRP%202011%20Symposium%20First%20Announcement.pdf> (accessed September 29, 2018)

Hunt P 'SDGs and the importance of formal independent review: An opportunity for health to lead the way' (2015) *Health and Human Rights Journal* available at <https://www.hhrjournal.org/2015/09/sdg-series-sdgs-and-the-importance-of-formal-independent-review-an-opportunity-for-health-to-lead-the-way/> (accessed 28 August 2018).

International Atomic Energy Agency (IAEA) *Leadership and Management for Safety: General Safety Requirements* IAEA Safety Standards Series No.GS-R-2 (2002) available at <https://www-pub.iaea.org/MTCD/Publications/PDF/Pub1750web.pdf> (accessed 15 December 2018)

Investigation Committee of the Accident at Fukushima Nuclear Power Stations of Tokyo Electric Power Company (Investigation Committee), Executive Summary of the Final Report (23 July 2012) available at <https://www.cas.go.jp/jp/seisaku/icanps/eng/120224SiryoOtherEng.pdf>

The National Diet of Japan Fukushima Nuclear Accident Independent Investigation Committee (page 38 of the Executive Summary) available at <http://warp.da.ndl.go.jp/info:ndljp/pid/3856371/naaic.go.jp/en/> (accessed 29 September 2018).

National Environmental Health Association (NEHA) available at <https://www.neha.org/about-neha/definitions-environmental-health> (accessed 21 June 2017).

Nuclear Energy Agency 'Impacts of the Fukushima Daiichi Accident on Nuclear Development Policies' (2017) ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT(OECD) 57. available at <https://inis.iaea.org/collection/NCLCollectionStore/Public/48/058/48058392.pdf> (accessed 8 September 2018).

Organization of African Unity (OAU) 'African Charter on Human and Peoples' Rights (Banjul Charter)', 27 June 1981, CAB/LEG/67/3 rev. 5, 21 I.L.M. 58 (1982), available at <http://www.refworld.org/docid/3ae6b3630.html> (accessed 21 August 2018).

South Africa 7th National Report on The Convention on Nuclear Safety (2016) available at <http://www.nnr.co.za/wp-content/uploads/2015/02/7th-CNS-Report-RSA.pdf> (accessed 26 November 2018).



- Treaty on the Nuclear-Weapon-Free Zone in Africa (Pelindaba Treaty) (1996) available at <http://www.peaceau.org/uploads/treaty-en-african-nuclear-weapon-free-zone.pdf> (accessed 9 September 2018).
- UN (ICESCR ) Treaty Series General Comment No. 3: 'The Nature of States' Parties Obligations' (1 January 1991) UN Doc. E/1991/23(SUPP) para 9. available at [https://tbinternet.ohchr.org/\\_layouts/treatybodyexternal/Download.aspx?symbolno=INT%2fICESCR%2fGEC%2f4758&Lang=en](https://tbinternet.ohchr.org/_layouts/treatybodyexternal/Download.aspx?symbolno=INT%2fICESCR%2fGEC%2f4758&Lang=en) (accessed 17 July 2018).
- UN (ICESCR) 'Treaty Series General Comment No. 14: The right to the highest attainable standard of health' (11 August 2000) UN Doc. E/C.12/2000/4. Art 12 para 33 available at <http://www.refworld.org/docid/3ae6b36c0.html> (accessed 15 December 2018).
- UN (ICESCR) Treaty Series Vol. 993: Treaties – 6 of 5 October 2001 UN Doc C.N.781.2001 3 available at [https://treaties.un.org/Pages/ViewDetails.aspx?src=IND&mtdsg\\_no=IV-3&chapter=4&clang=en](https://treaties.un.org/Pages/ViewDetails.aspx?src=IND&mtdsg_no=IV-3&chapter=4&clang=en) (accessed 17 July 2018).
- UN High Commissioner for Refugees (UNHCR), *Guiding Principles on Internal Displacement*, 22 July 1998, ADM 1.1, PRL 12.1, PR00/98/109, available at <http://www.refworld.org/docid/3c3da07f7.html> (accessed 29 September 2018).
- UN International Covenant on Economic, Social and Cultural Rights (ICESCR) 'Treaty Series' (1966) Vol. 993 3 available at <http://www.refworld.org/docid/3ae6b36c0.html> (accessed 10 March 2018).

### **Theses**

- Donald ME '*Advancing the Constitutional Goal of Social Justice through a Teleological Interpretation of Key Concepts in the Environmental Rights in Section 24*' (Unpublished LLM thesis, Stellenbosch University, 2014)
- Van den Bossche M-C '*Protection of the right to health through the human rights discourse in Africa of people in general and women in specific*' (Unpublished Masters' thesis, Faculteit Rechtsgeleerdheid Universiteit Ghent 2014).